



UK AIRPROX BOARD

ISSN 1479-2737

Analysis of Airprox in UK Airspace

Report Number 9
July 2002 to December 2002

Report by the UK Airprox Board,
'Analysis of Airprox in UK Airspace'
(July 2002 to December 2002)

produced jointly for

The Chairman,
Civil Aviation Authority

and the

Chief of the Air Staff,
Royal Air Force

FOREWORD

This report forms an essential part of the Airprox reporting process. Its purpose is to share widely the unfortunate experience of others and the lessons that can be extracted to prevent the same mistakes being repeated whether by newcomers or old hands, alike. Without this feedback loop little 'value-added' benefit would accrue in simply collecting and analysing Airprox data. For these reasons the book is aimed squarely at pilots and air traffic controllers. The language used is written in terms that both groups will readily understand, but which others might have some difficulty in getting to grips with. Each Airprox report is treated in the same way. The aim is to expose what took place and why and then assess what risk factor was involved; risk factor assessment is based on what did happen - not what might have happened. In those incidents where it is judged that change needs to be introduced, formal recommendations are made to the CAA and/or the MoD. These and the responses to them are always published and you will find the latest ones starting on page 15.

UKAB Report Number 9 covers full annual statistics for 2002 and compares these with results from previous years to see what trends and movements have occurred. However, the bulk of the report is devoted to the Board's findings on all Airprox filed within UK airspace between July and December last year. Because there were so many Airprox in that period - 129 - the report has been divided and produced in two volumes.

There were 81 Airprox (37% of total numbers) involving Commercial Air Transport (CAT) aircraft during 2002, compared with 82 (47% of total numbers) in the previous year. What changed significantly for the better, however, was the number of CAT risk-bearing results. Last year there were 7, which was half the total for 2001. Moreover, when expressed as a rate per 100,000 CAT flying hours in UK airspace, the CAT risk-bearing figure fell to the lowest yet seen at just 0.51. TCAS was largely responsible for this noteworthy improvement in safety and more details can be found in the CAT statistics section starting on page 8.

For those conflicts last year in which General Aviation (GA) pilots were involved, there were just 9 cases that resulted in Risk A assessments, compared with 24 examples in 2001. However, this improvement was gained at the expense of more Risk B results, which went up to 58 from 27 in 2001. Further information can be found in the GA section starting at page 10.

Military pilots found themselves involved in nearly 49% of all conflicts and, like their GA counterparts, Risk A returns fell, while those for Risk B rose, in proportions that were also similar. Specifically, there were 14 cases where an actual risk of collision occurred, compared with 27 in 2001; these were complemented by 33 'safety not assured' situations, an increase of 14 on the previous year's count.

A small number of Risk D results persist each year and returns in 2002 proved no exception. Of the 7 findings, 4 involved untraced balloons while helicopters were party to the other three.

Gordon McRobbie

Gordon McRobbie
Director, UKAB

CONTENTS

INTRODUCTION

Page

UKAB Composition	4
UKAB's Role	4
Status of UKAB Reports	4
Risk Categories	4

STATISTICS SECTION

The UKAB Data Set	5
Monthly Distribution	6
Trends by User Groups	6
Who Met with Whom during 2002	7
Types of Airspace Involved	7
Commercial Air Transport Section	
CAT Risk Results	8
CAT Airprox Rates	9
CAT Pilot & Controller Causal Factors	9
General Aviation Section	
GA Risk Results	10
GA Airprox Rates	11
GA Causal Factors	11
Military Aviation Section	
Military Risk Results	12
Military Airprox Rates	13
Military Causal Factors	13

AIRPROX TRENDS	14
----------------	----

UKAB RECOMMENDATIONS	15
----------------------	----

GLOSSARY OF ABBREVIATIONS	19
---------------------------	----

AIRPROX REPORTS	22
-----------------	----

INDEX	407
-------	-----

INTRODUCTION

UKAB COMPOSITION

The UKAB is an independent organisation sponsored jointly by the Civil Aviation Authority (CAA) and the Ministry of Defence (MOD) to deal with all Airprox reported within UK airspace. There are 8 civilian and 6 military 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. Each UKAB member is a volunteer - either a pilot or an air traffic controller - and together they 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.
- Commercial Air Transport flying (CAT).
- General Aviation (GA) flying, both fixed wing and rotary.
- Military flying by the RN, Army and the RAF, plus UK-based USAF aircraft.

UKAB's ROLE

The UKAB has the following roles in promoting improved safety standards in the air:

- The start point for an investigation process into each incident, carried out by the Safety Regulation Group (SRG) of the CAA and/or Military HQs and units.
- Determining what happened and providing an analysis of the main causal factors.
- Assessment of risk levels involved.
- Making recommendations where appropriate to prevent incident recurrence.
- Publishing and distributing full reports twice a year so that lessons can be learned.

STATUS OF UKAB REPORTS

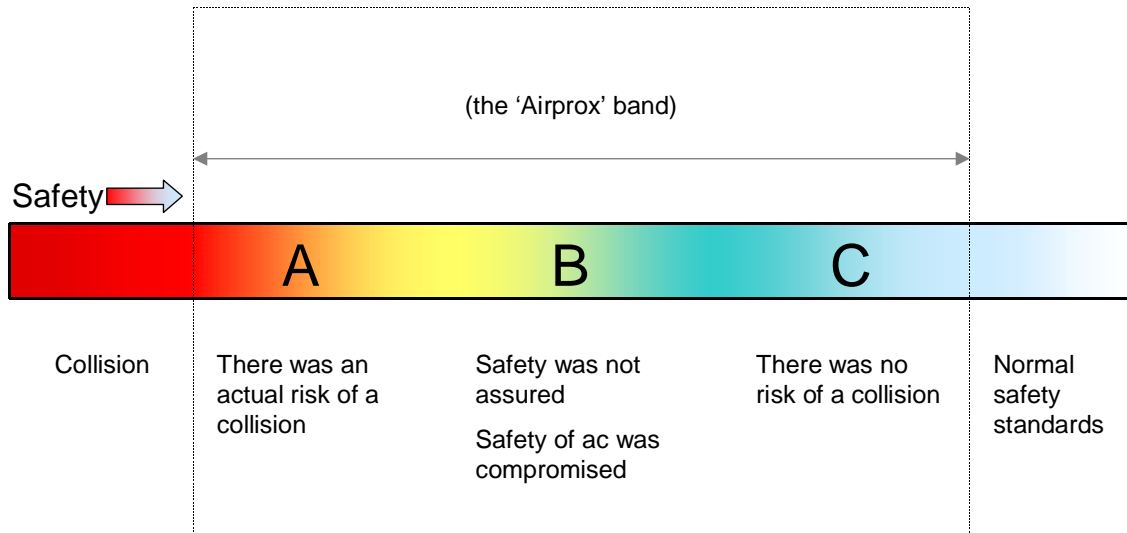
The sole objective of the United Kingdom Airprox Board shall be to assess reported Airprox in the interests of enhancing flight safety. It is not the purpose of the Board to apportion blame or liability. To encourage an open and honest reporting environment names of companies and individuals are not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

A pictorial representation of the main Airprox risk bands is shown below.



An AIRPROX is described as: "A situation in which, in the opinion of a pilot or a controller, the distance between ac as well as their relative positions and speed was such that the safety of the ac involved was or may have been compromised"

STATISTICS

THE UKAB DATA SET

Unless otherwise stated, all of the Airprox statistical information presented in this report has been taken from the UKAB database and is presented at two levels for ease of reference. The first level gives a broad overview on general trends. Second level detail then follows, where more specific results are shown for each of the following airspace user groups:

- CAT**
- Scheduled/Non-Scheduled passenger flights in Airliners and Helicopters
 - Cargo flights
- GA**
- Executive and Company aircraft (hired for specific reward)
 - Private and Flying Club aircraft
 - Gliders, sport aviation and airships
 - Aerial work
- Military**
- Aircraft flown by the RN, Army and RAF plus foreign military aircraft (UK airspace)
 - Defence Procurement Agency aircraft - formerly MOD (PE)

Notes:

(1) CAT flying hour totals are supplied by the Safety Regulation Group (SRG) of the CAA. They include figures from Eurocontrol on hours flown by commercial aircraft in transit through UK airspace as well as departures and arrivals to UK destinations.

(2) GA flying hours are based on aircraft with less than 5700 kg maximum take-off weight authorised; they include Microlights and Gliders, but exclude Gyroplanes and balloons. The British Gliding Association and the Registration Department of the CAA supply GA data. The latter organisation has recently updated their figures and changes have been incorporated in this report.

(3) Military flying hours are supplied by MOD DASA(Logistics) and include elements flown outside UK airspace.

AIRPROX RESULTS FOR 2002

Monthly Distribution

Fig 1 and Table 1 show the distribution of Airprox during 2002. Numbers were below normal during the first quarter, but then climbed to levels above the average from April to October inclusive.

These results reflect the general weather pattern over the UK during 2002. Unlike the previous two years, last Autumn saw long periods of fine flying conditions - and more Airprox were reported.

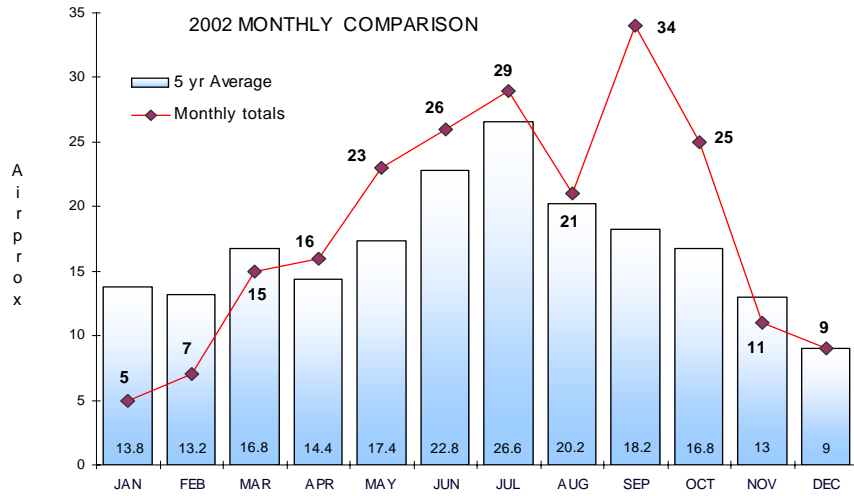


Figure 1

Table 1: Airprox distribution in 2002 against the 5-year average

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
5yr Avge	13.8	13.2	16.8	14.4	17.4	22.8	26.6	20.2	18.2	16.8	13	9	202.2
2002	5	7	15	16	23	26	29	21	34	25	11	9	221

Trends by User Groups

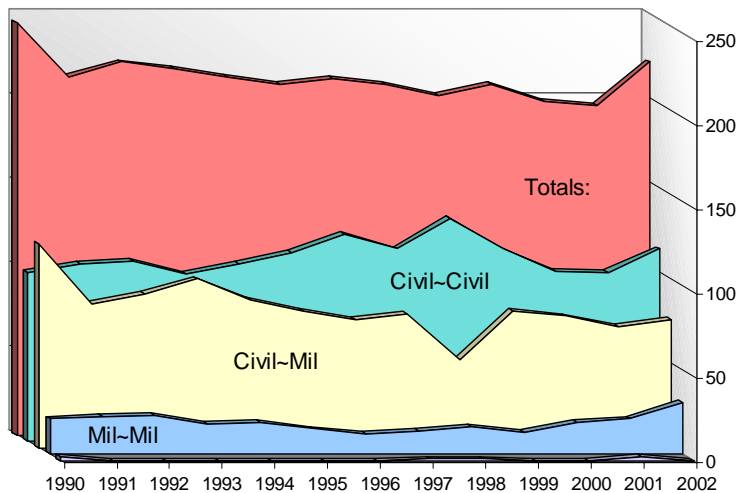


Figure 2: Airprox totals by user groups

Civil and military aircraft involvement in Airprox since 1990 is shown at Fig 2.

Mil~Mil conflicts remain the least in number, but a rise last year is evident. Next comes the Civil~Mil 'mix', and results in 2002 were largely similar to those in the previous two years. Civil~Civil conflicts still form the largest mix and rose by 14% during 2002.

The overall result of these combinations promoted a sharp rise in total numbers last year to 221. Comparative details are set out in Table 2.

Table 2: Airprox totals by user groups

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Unknown	2							1	1			2	
Mil~Mil	21	22	23	18	19	15	12	14	16	13	19	21	31
Civil~Mil	121	85	91	100	88	81	76	79	52	81	78	72	76
Civil~Civil	100	105	107	99	105	112	123	114	132	114	101	100	114
Totals:	244	212	221	217	212	208	211	208	201	208	198	195	221

How often did pilots meet during 2002 ... and from which groups?

All Airprox 2002	CAT: Cargo	CAT: Passenger	GA: Hire & Reward	GA: Company ac	GA: Glider	GA: Helicopter	GA: Private or Club	GA: Training	Military: Fixed Wing	Military: Glider	Military: Helicopter	Untraced aircraft	Weather Balloon	Unknown	Totals	Change on 2001
CAT: Cargo	1	1													2	+1
CAT: Helicopter			1												1	-2
CAT: Passenger	1	36	3	2			8	2	18	1	1	1	2	1	76	+2
CAT: Training			1												1	+1
GA: Hire & Reward			2				2	2	2		1				9	-4
GA: Company ac											1				1	-2
GA: Glider							4								4	-6
GA: Helicopter							1		15		2				18	+16
GA: Private or Club		1	3	2		3	22	2	6		1				40	+8
GA: Training	1		1				7		1						10	-1
Military: Fixed Wing			1		1	8	10	1	18	1	1				41	+3
Military: Glider							2		2						4	0
Military: Helicopter							4	1	5	1	3				14	+10
Totals:	3	38	12	4	1	11	60	8	67	3	10	1	2	1	221	+26

Figure 3: A breakdown of Airprox participants in 2002

The grid at Fig 3 shows how many times pilots met during 2002; those who 'reported' incidents are in the left hand column while the the top horizontal row shows the 'other party'. The far right hand column indicates the change on numbers filed in 2001 for each group. Some points to note:

- Like aircraft groups met each other most:
 - CAT: Passenger with CAT: Passenger (36 times)
 - GA: Private or Club with GA: Private or Club (22 times)
 - Military: Fixed Wing with Military: Fixed Wing (18 times)
- Airprox filed by GA:Helicopter pilots rose by 16 counts, while those filed by their Military: Helicopter pilot counterparts went up by 10 counts.
- Finally, total Airprox numbers in 2002 rose by 26, representing an increase of 13%.

Types of Airspace Involved

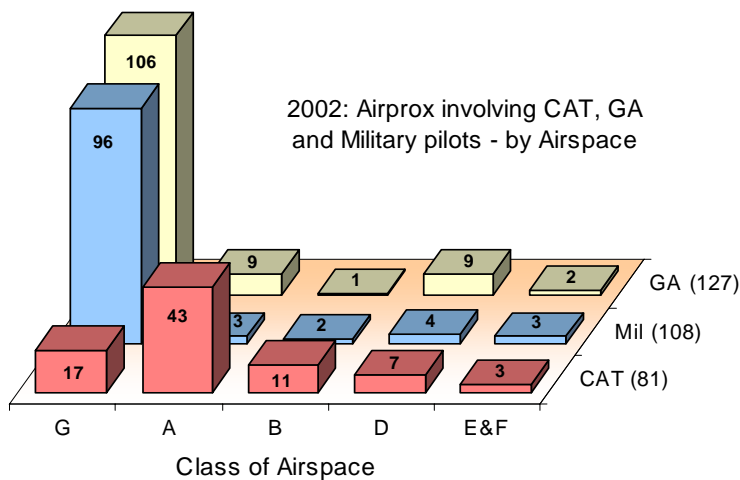


Fig 4 shows the type of airspace in which conflicts occurred, where at least one of the aircraft involved was either GA, Military or CAT. Detail on numbers is set out in the grid.

For military pilots, 88% of their Airprox numbers occurred in Class G airspace, while the corresponding figure for GA pilots was 83%. Unsurprisingly, conflicts often involved encounters between these two groups (57 cases).

79% of all Airprox, involving at least one CAT aircraft, took place inside regulated airspace. These were mostly in Terminal Control Areas (31%), or above FL 245 (13%) or in Airways (10%). One-in-five cases, however, occurred in the 'open FIR' in Class G airspace.

Figure 4: Airspace in which pilots experienced an Airprox

COMMERCIAL AIR TRANSPORT (CAT) SECTION

CAT Risk Results

Fig 5 (below) illustrates some of the longer-term trends on risk results that come from Airprox in which CAT aircraft have been involved. The various CAT Risk profiles are set against background information representing the wider picture - 'All Airprox' - to give a sense of proportion. Additionally, CAT flying hours have been included to demonstrate the magnitude of their rising trend over the years. For those who prefer more specific detail, all of the data used to construct Fig 5 is set out for information in Table 3.

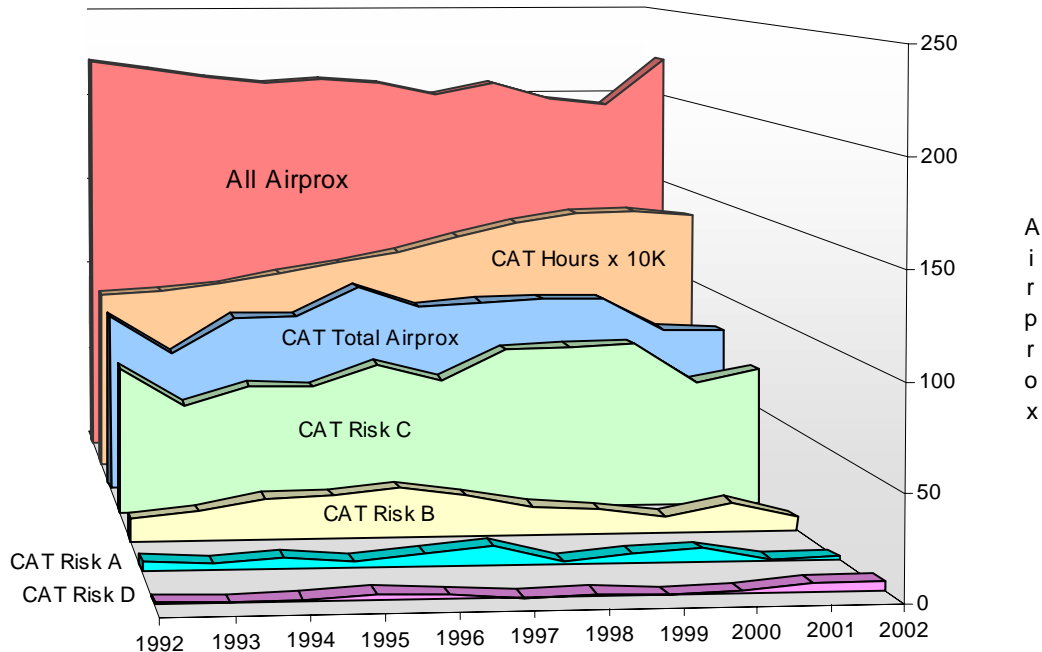


Figure 5: CAT Risk distribution 1992 - 2002

The first thing to draw attention to in Fig 5 is the relationship between the number of CAT flying hours flown and the number of Airprox that resulted. Whereas a general assumption, that more commercial flying is likely to lead to more Airprox, sounds reasonable, this has not happened, particularly over the last six years. In that period while flying hours went up Airprox numbers stabilised and then came down. Of more importance, most of the incidents turned out to have no collision risk (over 86% during 2002) and this is another trend that has endured well over the years. However, there have been, and continue to be, incidents where safety suffers compromise (Risk B); the chart shows how these compare in volume with other results. Overall Risk B results have been much fewer in number and gradually declined since their peak in the mid 90s. A similar pattern, but more so, emerges from Risk A numbers i.e. situations where an actual risk of collision had existed. There was a single example recorded in 2002 set against the CAT Airprox total of 81 incidents. Moreover, this encounter took place outside controlled airspace, away from the main airways structure. Completing the picture is a small, but nevertheless persistent, number of Airprox that cannot be assessed for risk, simply because of limited information revealed in the investigation process. There were four such cases in 2002, all against balloons whose point of origin could not be traced.

Table 3: CAT Risk data 1992 - 2002

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
CAT Risk A	5	3	5	3	6	9	1	4	6	0	1
CAT Risk B	11	14	20	21	24	20	14	12	8	14	6
CAT Risk C	75	55	65	64	75	67	82	83	84	64	70
CAT Risk D	1	0	1	3	2	0	1	0	1	4	4
CAT Total Airprox	92	72	91	91	107	96	98	99	99	82	81
Hours x 10K	94.6	96.8	100.4	106.1	111.8	117.9	125.9	133.2	138.9	139.5	136.6
All Airprox	221	217	212	208	211	208	201	208	198	195	221

CAT Airprox Rates

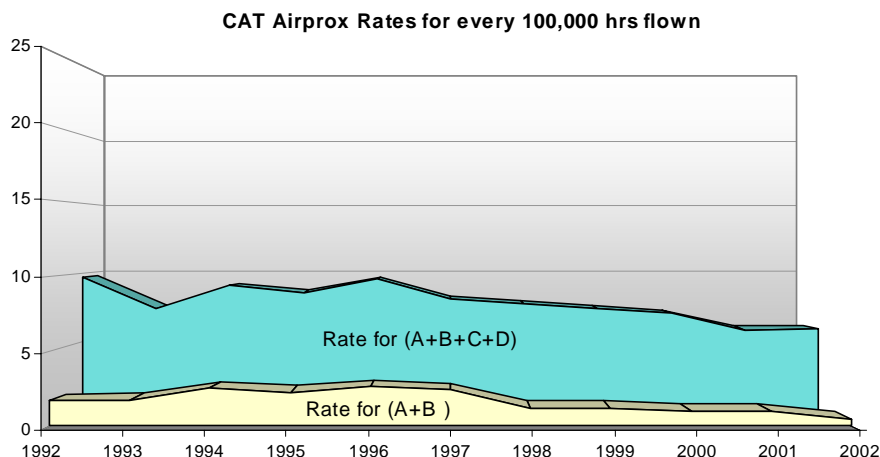


Figure 6: CAT Risk rates

Fig 6 presents risk trends in a slightly different way, based on the figures set out in Table 4. What Fig 6 depicts is the number of Airprox in every 100,000 flying hours flown by CAT aircraft in UK airspace, expressed as a rate. This gives a better insight into whether things are getting better, or worse. Two profiles are presented, one for the total picture and one for risk-bearing situations i.e. Risk A and Risk B categories. Looking first at the total rate - the green profile - this reveals a moderate but steady decline in total risk. More interesting results, however, lie in the 'yellow' risk-bearing profile. Inspection here shows that a marked stability set in from 1998 onwards and in 2002 the risk-bearing rate fell below one for the first time ever. The explanation for this very welcome downward trend in risk - is TCAS. Introduced in 1998 in growing numbers, the benefits were felt immediately and continue as more aircraft become so equipped.

Table 4: CAT Airprox rates per 100,000 flying hours

CAT Data	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
CAT Rate (A+B)	1.69	1.76	2.49	2.26	2.68	2.46	1.19	1.20	1.01	1.00	0.51
CAT Rate (A+B+C+D)	9.73	7.44	9.06	8.58	9.57	8.14	7.78	7.43	7.13	5.88	5.93
Hours flown in K	946	968	1004	1061	1118	1179	1259	1332	1389	1395	1366

CAT Pilot and Controller Causal Factors during 2002

Fig 7 tables the main reasons for CAT aircraft getting involved in close conflicts during 2002. Considering that commercial flights flew well over a million hours through UK airspace last year, the number of examples or incidence for each factor remains remarkably small. Roughly three quarters of CAT Airprox take place inside controlled airspace, so it is hardly surprising perhaps that 'controllers' head the list.

Ser	CAT Airprox Causal Factors	Totals	Attributed to
1	DID NOT SEPARATE/POOR JUDGEMENT	29	Controller
2	DID NOT ADHERE TO PRESCRIBED PROCEDURES/INSTRUCTIONS	9	Controller
3	DID NOT ADHERE TO PRESCRIBED PROCEDURES	7	Pilot
4	INAPPROPRIATE ATC INSTRUCTIONS	6	Controller
5	PENETRATION OF CAS/SRZ/ATZ WITHOUT CLEARANCE	6	Pilot
6	CLIMBED/DESCENDED THROUGH ASSIGNED LEVEL	6	Pilot
7	UNDETECTED READBACK ERROR	5	Controller
8	INADEQUATE/INCORRECT DATA DISPLAY	5	Controller
9	LACK OF CO-ORDINATION BETWEEN CONTROLLERS	5	Controller
10	FIR CONFLICT	5	Other
11	INADEQUATE AVOIDING ACTION / FLEW TOO CLOSE	5	Pilot

Figure 7: The most common causal factors for CAT aircraft involvement in Airprox during 2002

GENERAL AVIATION (GA) SECTION

GA Risk Results

Of the three groups of pilots that fly in UK airspace, those within the GA community account for the largest and most diverse, flying everything from microlights and light fixed wing aircraft, to helicopters and a whole range of company owned modern, high performance machines. A further wide variation exists in the flying experience levels of GA pilots, which ranges from 'first solos' all the way through to those with thousands of hours. None of this, however, provides any protection or immunity from the unwelcome experience of an unplanned and unexpected close encounter in the air. Fig 8 shows how many of these have involved GA pilots over the years, which can be compared in turn against the UK grand total. For those who wish more detail, reference to Table 5 will reveal precise figures.

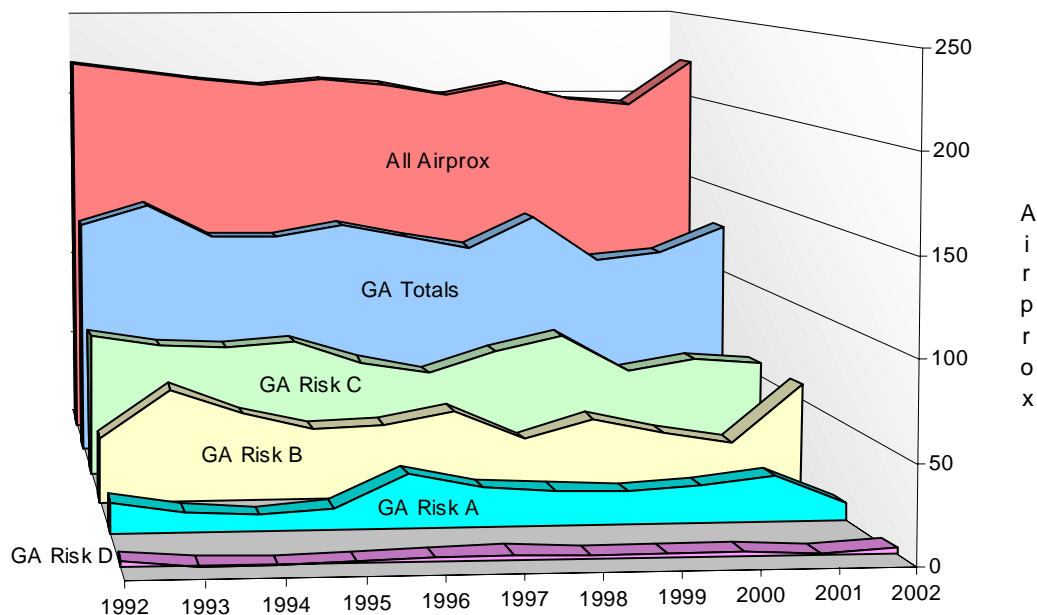


Figure 8: GA Risk distribution 1992 - 2002

Broadly speaking, GA pilots have taken part in just under 60% of all Airprox in UK airspace each consecutive year. In more recent years a little over half of these incidents resulted in no collision risk, leaving a fairly high proportion that ended up in the 'safety not assured' or 'actual collision risk' categories. Profiles for these two latter situations show variations - Risk B more so than Risk A - but the Risk B numbers had started to come down, while those for Risk A were reasonably consistent ... until 2002. Last year saw a welcome dive in collision risk 'A' returns, but these appear to have been achieved at the expense of much higher 'B' cases; these outcomes shot up sharply to 58 and just ahead of the 'no collision' Risk C total. Weather conditions can be an accurate barometer to reflect GA Airprox numbers, but other factors often determine just how close pilots manage to get to each other's aircraft, unseen. One major factor is aircraft colour. Many light aircraft and most gliders are white and this can serve to provide little or no contrast against background features. It is the lack of contrast, frequently accompanied by lack of movement in the windscreen, that makes many aircraft difficult to see even in very good conditions of visibility and it explains in part why the ratio between Risk C:Risk B was so unfavourable during 2002's good weather.

Table 5: GA Risk data 1992 - 2002

GA Data	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
GA Risk A	16	10	8	11	28	20	18	17	19	24	9
GA Risk B	34	60	46	38	39	46	30	41	33	27	58
GA Risk C	78	72	70	73	61	54	66	74	54	60	57
GA Risk D	3	0	0	1	2	3	2	2	2	1	3
GA Totals	131	142	124	123	130	123	116	134	108	112	127
All Airprox	221	217	212	208	211	208	201	208	198	195	221

GA Airprox Rates

Fig 9 shows rate results for Airprox involving GA pilots. Figures are calculated on the number of incidents per 100,000 GA flying hours each year and derive from the information set out in Table 6, based on data supplied by the CAA.

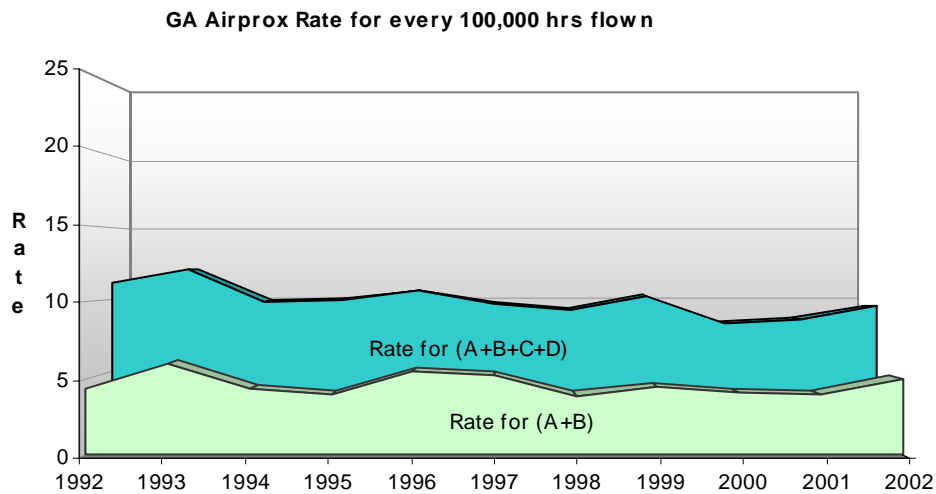


Figure 9: GA Rates

While there has been no marked variance in movement for either of the two profiles shown, the total GA rate in 2002 edged upwards, as did the risk-bearing rate which moved to its highest level for five years. The reason behind the latter trend can be attributed almost wholly to the leading two elements in Fig 10.

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

GA Data	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Rate for (A+B)	4.27	5.97	4.29	3.97	5.46	5.20	3.84	4.43	4.03	3.90	5.00
Rate for (A+B+C+D)	11.18	12.12	9.86	9.96	10.60	9.69	9.29	10.24	8.37	8.55	9.48
Hours flown in K	1172	1172	1258	1235	1226	1270	1248	1309	1290	1309	1340

GA Causal Factors

Factors behind most 'GA Airprox' remain largely unchanged and difficulties in seeing the other aircraft continue to dominate the scene for reasons that are well understood and documented. Fig 10 illustrates findings for 2002; some form of affordable Collision Warning System is needed to achieve improvements.

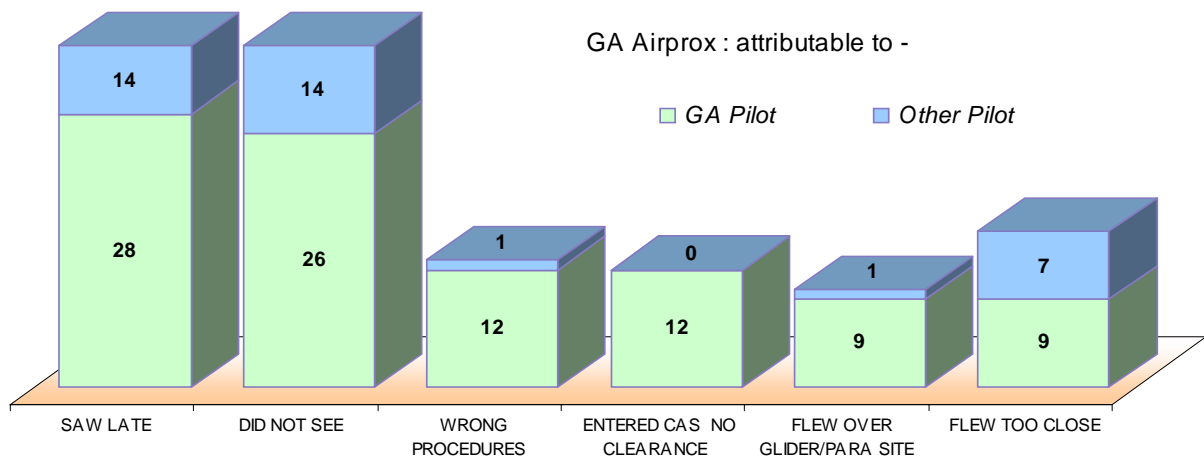


Figure 10: The most common reasons for Airprox involving GA pilots during 2002

MILITARY SECTION

Military Risk Results

During 2002, Military pilots were involved in 108 Airprox, or 49% of the year's total Airprox figures. Whereas this percentage result has remained virtually unchanged for the last three years, the number of incidents filed in 2002 was the highest for nine years. Fig 11 shows how the various totals compare in movement, together with the risk profiles that emerge from them. More detailed figures are set out in Table 7.

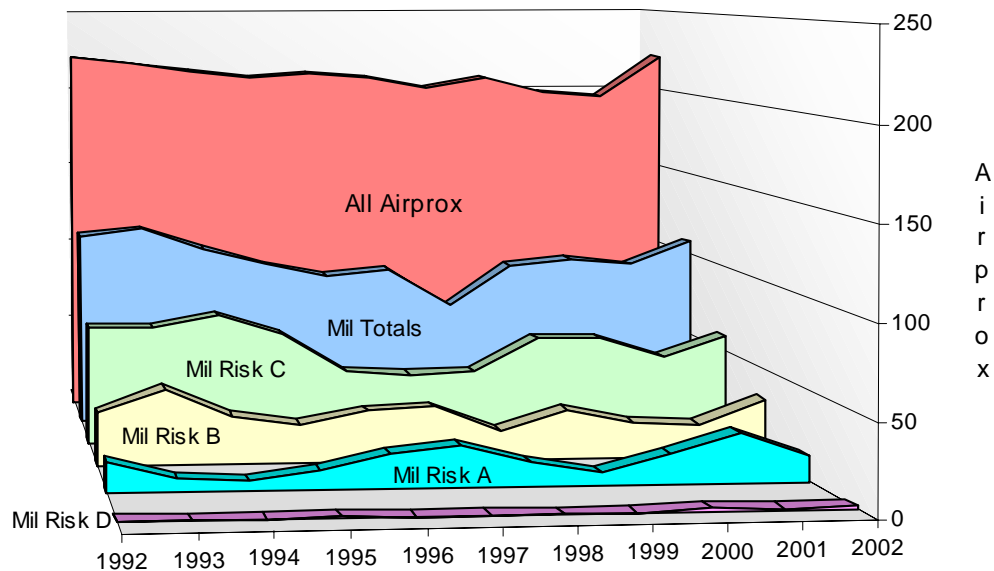


Figure 11: Military risk distribution

Last year 55% of all the encounters that Military pilots were party to had outcomes in which no collision risk was involved. This situation for Risk C, where 'more' means 'better', represents a 5% improvement on results for 2001. There were two additional cases that were assessed as Risk D - situations in which insufficient information was revealed during the investigation to permit any sensible assessment on hazard.

Turning next to address Risk A results - i.e. cases where there was an actual risk of collision - unlike Risk C results, improvements here are indicated by reductions, not increases. Data collected over the last ten years or so suggest a cyclical pattern in Risk A returns and figures for last year indicate that it may be continuing. The 14 cases recorded last year were almost half the number recorded in 2001. This in itself is a welcome turn, but needs to be linked with Risk B results to gain the wider picture. When the latter is taken into account we can see that reductions in Risk A appear to have been gained at the expense of more Risk B cases - i.e. situations in which safety was not assured - which went up by 74%. At first glance there was little change to the 'risk-bearing total' (Risk A+B). Last year it was 47 compared with 46 in 2001. However, when expressed as a percentage against the Military totals for each of the two years, last year saw a 6% reduction - i.e. an improvement.

Table 7: Military risk data 1992 - 2002

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Mil Risk A	16	7	5	10	19	23	13	7	16	27	14
Mil Risk B	30	43	27	22	29	31	17	28	21	19	33
Mil Risk C	68	68	74	63	40	38	39	59	58	47	59
Mil Risk D	0	0	0	1	0	0	0	0	2	1	2
Mil Totals	114	118	106	96	88	92	69	94	97	94	108
All Airprox	221	217	212	208	211	208	201	208	198	195	221

Military Airprox Rates

Fig 12 shows rate results since 1992 for Airprox involving Military pilots; rates are calculated using the number of incidents per 100,000 Military flying hours each year and derive from the information set out in Table 8 below.

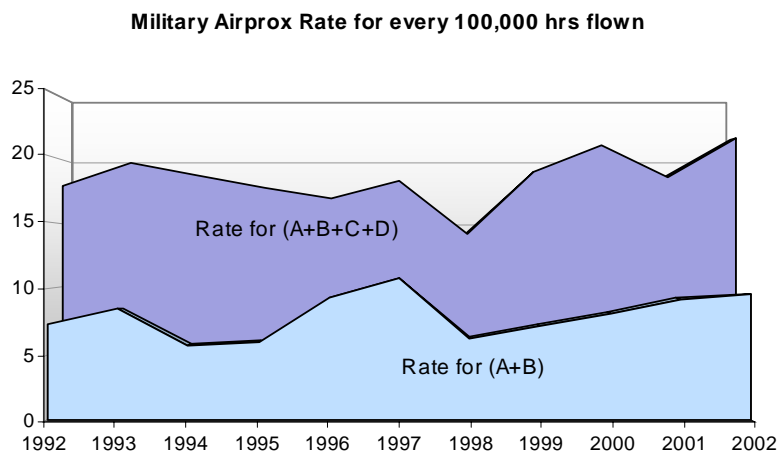


Figure 12: Military risk rates

Most of the Airprox that make up the 'total' rate profile were conflicts between mixed Civil and Military pilots - note the dip in 1998 reflecting the same reduction that shows up in Fig 2 on page 6. Two broad points emerge from the chart above. One is that Military pilots have in recent years become more involved in reported incidents. The other is that last year saw a welcome attenuation in the risk-bearing rate, breaking what had previously been a consistent and persistent steady rise.

Table 8: Military Airprox rates per 100,000 flying hours

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Rate for (A+B)	7.28	8.40	5.69	5.94	9.27	10.78	6.17	7.13	8.07	9.16	9.50
Rate for (A+B+C+D)	18.04	19.83	18.86	17.81	16.99	18.36	14.20	19.14	21.16	18.73	21.83
Hours flown in K	632	595	562	539	518	501	486	491	458	502	495

Military Causal Factors

Fig 13 shows the most common reasons for conflicts in which Military pilots took part. None is new but all correlate with the factors experienced by GA pilots (see Fig 10). Both groups need, and would benefit greatly from, some form of affordable Collision Warning System.

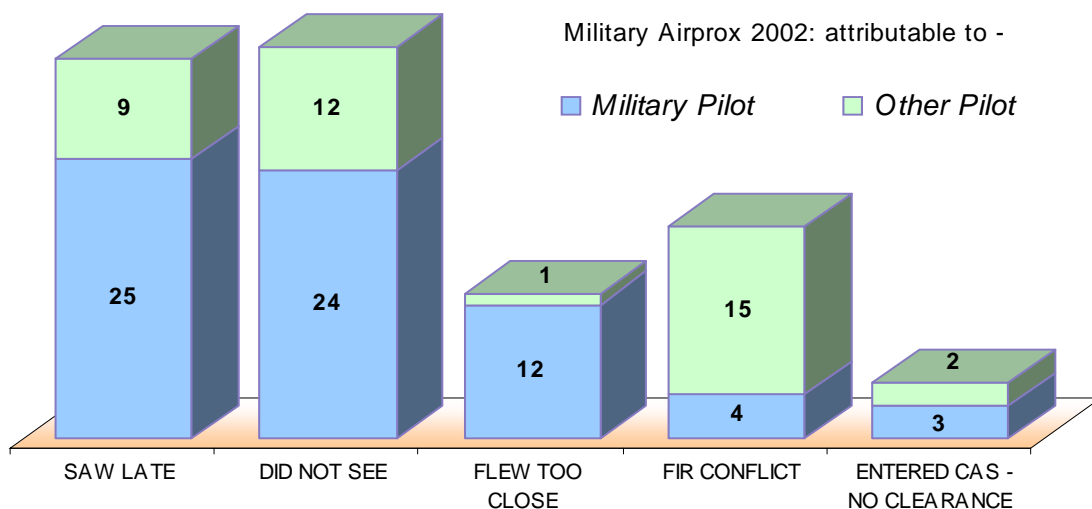


Figure 13: The most common reasons for Airprox involving Military pilots during 2002

Airprox Trends

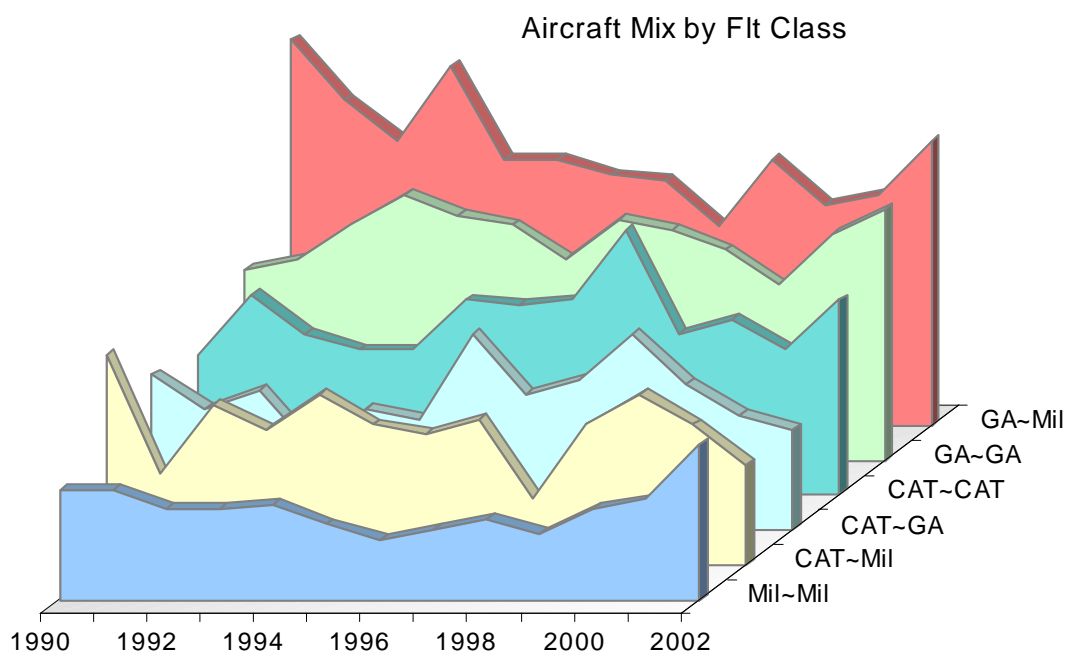


Figure 14: Airprox trends by Flight Classification

There are six different Airprox combinations in which CAT, GA and Military pilots can meet and the chart at Fig 14 illustrates how trends in these, in terms of numbers, have run since 1990. Each of the profiles is based on the data set out below in Table 9.

Table 9: Airprox trends - annual encounters involving CAT, GA and Military pilots

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Mil-Mil	22	22	18	18	19	15	12	14	16	13	18	20	31
CAT-Mil	42	18	32	27	34	28	26	29	13	28	34	28	20
CAT-GA	31	24	28	16	24	22	39	27	30	39	29	23	20
CAT-CAT	28	40	32	29	29	39	38	39	53	32	35	29	39
GA-GA	38	40	47	53	49	47	40	48	46	42	35	45	50
GA-Mil	77	65	57	72	53	53	50	49	40	53	44	46	57

Since 1990 the most common combination involved GA and Military pilots (716 encounters), which consistently outnumbered all other combinations. These numbers were showing faltering signs of decline overall, until last year when some good weather during autumn resulted in a sharp upturn once more. Next most prolific as a group came GA pilots meeting with other GA pilots (580 Airprox). Here the pattern on numbers shows two periods when they rose, followed each time by a successful run of consecutive years when they fell. If this sequence repeats a third time, we can expect the ascending results of 2001 and 2002 to be followed by another short run of reduced figures. Perhaps surprisingly, the next largest group involved in Airprox (462 examples) were pilots of commercial passenger flights. Their numbers have largely occupied a band between 28 and 40 incidents each year, with an exceptional single peak of 53 in 1998, the year when TCAS equipment was introduced in large numbers.

Since 1990 there has been little to separate the number of times CAT pilots met either GA pilots (352 incidents) or Military pilots (359 times), but profiles for the two groups reveals some points. Before 1996, involvement by GA pilots was generally low, but then reversed for a period, up to the millennium, before settling into welcome decline. Conversely, the CAT-Mil profile was more evenly spread throughout, but with some notable exceptions. The 'low' in 1991 is a reflection of the first Gulf War. Likewise the next 'low' in 1998 owes much to war in the Balkans and the departure of A10s from the UK in that year. Last year's count of 20 was the lowest for this group since 1998. Finally, the smallest cumulative tally (238 Airprox) of all the groups, was returned from conflicts involving Military pilots only. However, last year they continued a rising trend by filing 57 incidents, a total not seen for some 10 years.

UKAB RECOMMENDATIONS

Recommendations are made when the Board believes that attention needs to be drawn to particular safety matters, e.g. where risk bearing incidents are repeated or where improved practices may prove beneficial. Subsequent 'acceptance' or 'non acceptance' is a matter for the organisation concerned to decide, based on its own professional judgement. The information that follows updates Recommendations published in Report Number 8 and lists new ones.

Airprox 196/01 on 10 Nov 01 - involving a B747 and an A330: Risk B

RECOMMENDATION: That the CAA considers:

- a. A review of ATC and aircrew procedures and arrangements to eradicate errors in OCA entry estimates.
- b. Including a check of the entry clearance time as part of the OCA entry clearance message.
- c. A review of procedures and equipment used to transmit emergency messages immediately to aircraft in oceanic airspace.

CAA Action: The CAA accepts this Recommendation. NATS has already agreed to undertake the actions called for by this Recommendation, and the review process will be audited by the Safety Regulation Group's ATS Standards Department. In addition, the CAA has issued a Flight Operations Department Communication (FODCOM), No 25/2002 dated 16 October 2002, to all transatlantic operators bringing this serious incident to their attention. It recommended that all operators review their procedures for the cross-checking of Oceanic Airspace entry point estimates, amending their operations manuals where necessary. Operators were also recommended to ensure that all flight crew engaged on flights that enter Oceanic Airspace are reminded of the importance of ensuring that the Oceanic Boundary estimate is correct.

Following discussions with the Irish Aviation Authority (IAA) at Ballygirreen to agree a method of speedier delivery of emergency messages and the phraseology to be used, new procedures have been produced. These new procedures were published to all Prestwick Oceanic Centre Staff in Supplementary Instruction 22/03. The new procedures detailed in SI 22/03 were approved by UK CAA Safety Regulation Group on 24th April 2003, and published to staff on 13th May 2003 - effective immediately.

Status on (a), (b) - Accepted - Closed ; Status on (c) – Closed

Airprox 30/02 on 1 Apr 02 - involving an A320 and a PA34: Risk C

RECOMMENDATION: That the CAA asks NATS to review the efficacy of the London FIS as currently provided.

CAA/NATS Action: The CAA accepts this Recommendation. NATS will conduct a review of the FIS operation at the London Area Control Centre and produce a report with any necessary recommendations by the end of January 2003. UKAB will be informed as to the outcome.

Status – Open

Airprox 47/02 on 22 Apr 02 - involving a DHC8 and a SHAR: Risk C

RECOMMENDATION. That the MoD considers:

- a. A review of the rules for Visual Identification by military air defence ac in UK airspace.
- b. The feasibility of including an independent Air safety cell ashore for each RN AD exercise at sea, within UK airspace.

MoD Action: The MoD is processing this Recommendation. The RN cannot undertake to provide an independent air safety cell for every air defence exercise, but staff will examine the feasibility of increased liaison with adjacent aerodromes prior to more complex exercises that occur in the open FIR.

**Status - Acceptance on (a) - Open
Partial Acceptance on (b) - Closed**

Airprox 67/02 on 28 May 02 - involving an Embraer 145 and an Islander: Risk C

RECOMMENDATION: That the CAA considers publishing clarification on the meaning of “Radar Control” within Class D airspace for ac operating to different flight rules.

CAA Action: The CAA accepts this Recommendation. In view of the misunderstandings that have become apparent as a result of this Airprox, the CAA will reiterate, through various publications such as FODCOM (Flight Operations Department Communication), ATSIN (Air Traffic Services Information Notice) and GASIL (General Aviation Safety Information Leaflet), details of the various airspace types in use in the United Kingdom and the air traffic services that are provided in them. The meaning of “Radar Control” as it applies to IFR and VFR traffic will be included.

Status - Accepted - Closed

Airprox 102/02 on 2 Jul 02 - involving an RJ85 and a Jaguar: Risk A

RECOMMENDATION: The MOD should convey STC’s advice to all military pilots operating in UK airspace and publicise the incident as widely as possible.

MoD Action: MoD accepts this Recommendation. Details of the incident have been passed to the DASC who will feature the lessons to be learned from it in an article in the Tri-Service magazine ‘Aviate’.

Status – Closed

Airprox 104/02 on 3 Jul 02 - involving Jaguars x 2 and an AS332L2: Risk B

RECOMMENDATION: That the MOD considers, through HQ STC Flight Safety and Ops Spt ATC, a review of the guidance promulgated to military controllers in JSP 318A, about expressing the vertical position of ac by reference to the appropriate height/altitude/flight level datum when included within traffic information.

MoD Action: The MoD considers that the training received by military controllers should leave them in no doubt as to the dangers of mixing height, altitude and flight level information. Likewise the need for caution is emphasised in JSP 318A. However, several areas within JSP 318A have been identified where improvements could be made and these are being implemented in due course in the new JSP 552. Meanwhile, these changes and lessons learned will be highlighted to military ATC controllers, the Central ATC School, the ATC Examining Board and the ASACS community.

Status - Accepted – Closed

Airprox 105/02 on 3 Jul 02 - involving an Embraer 145 and a DHC8: Risk B

RECOMMENDATION: The CAA gives wide publicity to this incident and the lessons to be learned.

CAA Action: The CAA accepts this Recommendation. The CAA will give wide publicity to this incident by way of the issuance of a Flight Operations Department Communication (FODCOM) and in the General Aviation Safety Information Leaflet (GASIL). The subject documents are planned to be published by the end of August 2003. Regarding publicity in respect of the lessons to be learned, the CAA considers that FODCOM 19/2002 “ACAS – Action to be taken following a Resolution Advisory (RA) Warning” contains up-to-date advice. The CAA will therefore make reference to this FODCOM in the publicity described above.

Status - Accepted - Closed

Airprox 113/02 14 Jul 02 involving an Embraer 145 and a Paraglider: Risk C

RECOMMENDATION: In light of this incident, the CAA should consider looking at arrangements surrounding unregulated flying activities in UK airspace.

CAA Action: The CAA accepts this Recommendation and has reviewed arrangements surrounding unregulated flying activities in UK airspace. At present there is no compelling case for changing the arrangements for unregulated flying. However, the CAA will continue to monitor these arrangements and to provide support to the national airports associations and governing bodies with a view to ensuring best practice in the future.

Status - Accepted - Closed

Airprox 117/02 on 15 Jul 02 - involving a Robin and a Hercules: Risk B

RECOMMENDATION: That the MOD reviews the existing regulations within JSP 318 Joint Regulations Section 3 - 05111 (and its subsequent replacement) to ensure they are in accord with that promulgated within the ANO and UK AIP. Additionally, that the MOD defines more clearly within RAF FLIPs, the R/T frequencies used at UK civil and military airfields by participants of activities which occur outside of the applicable ATSU's hours of watch.

MOD Action: The MoD is processing this Recommendation.

Status - Open

Airprox 222/02 on 15 Nov 02 - involving a B747 and a B767: Risk B

RECOMMENDATION: That the CAA asks NATS to review and amend the way in which Track Data Blocks and aircraft symbols are displayed, to remove the scope for future confusion.

NATS ACTION: NATS has conducted a review and the action already taken, together with that proposed, is described below. Shortly after the Airprox occurred, as an interim measure, the London Area Control Centre (LACC) issued a Supplementary Instruction (SI 102/02, effective 16 December 2002) requiring Tactical Controllers, when moving individual labels from the globally set position, to ensure that the Track Data Block (TDB) is displayed on a strut to the aircraft target symbol. In addition, LACC staff have been working on software modifications to improve the manner in which TDBs are displayed. In changes (Workstation Situation Display Improvements) scheduled for introduction in April 2004, there are a number of enhancements. These are designed to improve the clarity of TDBs and to help overcome problems associated with overlapping TDBs. In the context of this Airprox, when an individual TDB is moved, a strut will be forced onto the display. TDB struts will be attached as closely as possible to the relevant TDB text by changing both the strut and strut attachment points.

Status - Accepted - Closed

GLOSSARY OF ABBREVIATIONS

AAA	Airfield Avoidance Area	BGA	British Gliding Association
AAI	Angle of Approach Indicator	BHAB	British Helicopter Advisory Board
aal	Above aerodrome level	BHPA	British Hang Gliding and Paragliding Association
ac	Aircraft		
ACAS	Airborne Collision Avoidance System	BINA ERS	British Isles/N America En Route Supplement
ACC	Area Control Centre	BMAA	British Microlight Aircraft Association
ACN	Airspace Co-ordination Notice	c	circa
ACR	Aerodrome Control Radar	CAA	Civil Aviation Authority
A/D	Aerodrome	CALF	Chart Amendment - Low Flying
ADA	Advisory Area	CANP	Civil Air Notification Procedure
ADC	Aerodrome Control(ler)	CAS	Controlled Airspace
ADF	Automatic Direction Finding Equipment	CAT	Clear Air Turbulence
ADNC	Air Defence Notification Centre	CAVOK	Visibility, cloud and present weather better than prescribed values or conditions
ADR	Advisory Route	CFI	Chief Flying Instructor
AEF	Air Experience Flight	CinC Fleet	Commander in Chief Fleet, Royal Navy
AEW	Airborne Early Warning	CLAC	Clear Above Cloud
AFIS(O)	Aerodrome Flight Information Service (Officer)	CLAH	Clear Above Haze
agl	Above Ground Level	CLBC	Clear Below Cloud
AGI	Air Ground Incident	CLBL	Clear Between Layers
AIAA	Area of Intense Aerial Activity	CLOC	Clear of Cloud
AIC	Aeronautical Information Circular	CPA	Closest Point Of Approach
AIP	Aeronautical Information Publication	CMATZ	Combined MATZ
AIS	Aeronautical Information Services	CPA	Closest Point of Approach
amsl	Above mean sea level	C/S	Callsign
ALFENS	Automated Low Flying Enquiry & Notification System	CTA	Control Area
AOB	Angle of Bank	CTR/CTZ	Control Zone
A/P	Autopilot	CWS	Collision Warning System
APP	Approach Control(ler)	DAAvn	Director Army Aviation
ARA	Airspace Restricted Area	DAT	Defence Air Traffic
ARP	Aerodrome Reference Point	D & D	Distress & Diversion Cell
ASACS SSU	Air Surveillance and Control System Standards and Safety Unit	DF	Direction Finding (Finder)
ASR	Airfield Surveillance Radar	DFTI	Distance from Touchdown Indicator
ATC	Air Traffic Control	DH	Decision Height
ATCC	Air Traffic Control Centre	DI	Direction Indicator
ATCO	Air Traffic Control Officer	DME	Distance Measuring Equipment
ATCRU	Air Traffic Control Radar Unit	DFDR	Digital Flight Data Recorder
ATIS	Automatic Terminal Information Service	DUA	Dedicated User Area
ATM	Aerodrome Traffic Monitor	EAT	Expected Approach Time
ATS (U)	Air Traffic Service (Unit)	ERS	En Route Supplement
ATSA	Air Traffic Service Assistant	est	estimated
ATSOCAS	ATSs Outside Controlled Airspace	FIC	Flight Information Centre
ATSI	Air Traffic Services Investigations	FIR	Flight Information Region
ATZ	Aerodrome Traffic Zone	FIS	Flight Information Service
AWACS	Airborne Warning and Control System	FISO	Flight Information Service Officer
AWR	Air Weapons Range	FMS	Flight Management System
AWY	Airway	FO	First Officer
Bdry	Boundary	fpm	Feet Per Minute
		FPS	Flight Progress Strip
		FW	Fixed Wing

GAT	General Air Traffic	MTRA	Military Temporary Reserved Airspace
GCA	Ground Controlled Approach	NATS	National Air Traffic Services
GCI	Ground Controlled Interception	NDB	Non - Directional Beacon
GMC	Ground Movement Controller	nm	Nautical Mile(s)
GP	Glide Path	NK	Not Known
H	Horizontal	NOTAM	Notice to Airmen
HISL	High Intensity Strobe Light	NR	Not Recorded
HLS	Helicopter Landing Site	NVG	Night Vision Goggles
HMR	Helicopter Main Route	OAC	Oceanic Area Control
HPZ	Helicopter Protected Zone	OACC	Oceanic Area Control Centre
HTZ	Helicopter Traffic Zone	OAT	Operational Air Traffic
HUD	Head Up Display	ODL	Opposite Direction Level
iaw	In accordance with	OHD	Overhead
ICF	Initial Contact Frequency	OJTI	On-the-Job Training Instructor
IFF	Identification Friend or Foe	OLDI	On-Line Data Interchange
IFR	Instrument Flight Rules	PAR	Precision Approach Radar
IICL	Intermittently In Cloud	PFL	Practice Forced Landing
ILS	Instrument Landing System	PF	Pilot Flying
IMC	Instrument Meteorological Conditions	PI	Practice Interception
JOI	Joint Operating Instruction	PIC	Pilot in Command
JSP	Joint Services Publication	PINS	Pipeline Inspection Notification System
KHz	Kilohertz	PNF	Pilot Non-flying
KLWD	In Cloud	PTC	Personnel & Training Command
kt	Knots	QDM	Magnetic heading (zero wind)
Km	Kilometres	QFE	Atmospheric pressure at aerodrome airport elevation (or at runway threshold)
L	Left	QFI	Qualified Flying Instructor
LACC	London Area Control Centre (Swanwick)	QHI	Qualified Helicopter Instructor
LARS	Lower Airspace Radar Service	QNH	Altimeter sub - scale setting to obtain elevation when on the ground
LAS	Lower Airspace Service	QSY	Frequency change
LATCC(Mil)	London Air Traffic Control Centre (Military) (West Drayton)	QTE	True bearing
LFA	Low Flying Area	RA	Resolution Advisory (TCAS)
LFBC	Low Flying Booking Cell	RAF	Royal Air Force
LFC	Low Flying Chart	RAS	Radar Advisory Service
LFS	Low Flying System	RHS	Right Hand Side
LHS	Left-hand side	RIS	Radar Information Service
LLZ	Localizer	RNAS	Royal Naval Air Station
LJAO	London Joint Area Organisation (Swanwick (Mil))	ROC	Rate of Climb
LOA	Letter of Agreement	ROD	Rate of Descent
LTMA	London TMA	RPS	Regional Pressure Setting
MACC	Manchester Area Control Centre	RSO	Range Safety Officer
MATS	Manual of Air Traffic Services	RT	Radio Telephony
MATZ	Military Aerodrome Traffic Zone	RTB	Return to base
mb	Millibars	RVSM	Reduced Vertical Separation Minimum
MEDA	Military Emergency Diversion Airfield	RW	Runway
MHz	Megahertz	RVR	Runway Visual Range
MOD	Ministry of Defence	SAP	Simulated Attack Profile
MRSA	Mandatory Radar Service Area (Military Area)	SC	Sector Controller
MSA	Minimum Safe Altitude	ScATCC(Mil)	Scottish Air Traffic Control Centre (Military) (Prestwick)
MSD	Minimum Separation Distance	SCH	Set Clearance Height
MTA	Military Training Area		

ScOACC	Scottish and Oceanic Area Control Centre	TRUCE	Training in Unusual Circumstances and Emergencies
SOC	Sector Operations Centre	UAR	Upper Air Route
SID	Standard Instrument Departure	UDF	Ultra High Frequency Direction Finder
SIF	Selective Identification Feature	UHF	Ultra High Frequency
SMF	Separation Monitoring Function	UIR	Upper Flight Information Region
SPS	Standard Pressure Setting (1013mb)	UKDLFS	United Kingdom Day Low Flying System
SRA	Surveillance Radar Approach	UKNLFS	United Kingdom Night Low Flying System
SRA	Special Rules Area	UNL	Unlimited
SRE	Surveillance Radar Element of precision approach radar system	USAF(E)	United States Air Force (Europe)
SSR	Secondary Surveillance Radar	USL	Underslung Load
STAR	Standard Instrument Arrival Route	U/T	Under Training
STC	Strike Command	UTA	Upper Control Area
STCA	Short Term Conflict Alert	UTC	Co-ordinated Universal Time
SVFR	Special VFR	V	Vertical
TA	Traffic Advisory (TCAS)	VCR	Visual Control Room
TANS	Tactical Air Navigation System	VDF	Very High Frequency Direction Finder
TBC	Tactical Booking Cell	VFR	Visual Flight Rules
TC	Terminal Control	VHF	Very High Frequency
TCAS	Traffic Alert & Collision Avoidance System	VMC	Visual Meteorological Conditions
TDA/TRA	Temporary Danger or Restricted Area	VOR	Very High Frequency Omni Range
TFR	Terrain Following Radar	VRP	Visual Reporting Point
TMA	Terminal Control Area		

AIRPROX REPORT No 102/02.

AIRPROX REPORT NO 102/02

Date/Time: 2 Jul 1410z

Position: 5453N 0100W (25nm SE Newcastle)

Airspace: FIR (Class: G)

Reporting Aircraft Reporting Aircraft

Type: RJ85 Jaguar

Operator: CAT HQ STC

Alt/FL: FL70 FL70

Weather IMC IMC

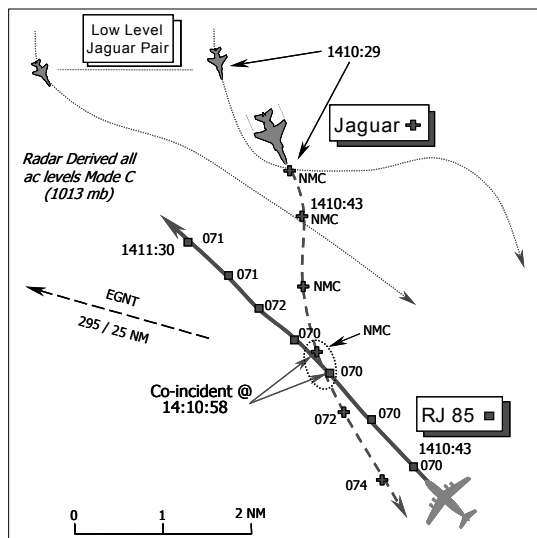
Visibility: NR NR

Reported Separation:

0H, 100ft V NR

Recorded Separation:

Contacts merged



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE RJ85 PILOT reports that he was inbound to Newcastle (NCL), flying in IMC and receiving vectors from APPROACH (A

PR). The ac was maintaining FL70, at 250 kt, squawking assigned code with Mode C. Suddenly he saw a "blue target" appear on TCAS within 2.5nm which changed quickly to yellow then red, with an associated "CLIMB" aural warning. The autopilot was disconnected in order to follow the TCAS commands, but at about the same time the crew heard jet engine noise from another ac and the First Officer in the RHS "saw him in a flash passing underneath while in a steep climb". Minimum separation was assessed as 100ft and risk as "high". As the crew had only just started avoiding action, their ac only deviated by an estimated 50ft above assigned level.

THE JAGUAR PILOT reports that he was operating as "bounce" ac to two other Jaguars. His ac was grey and HISLs were selected on. At the time of the Airprox he was squawking 7001 with Mode C. TCAS was not fitted. Operating in "good VMC" to the north east of NCL at FL120, he positioned his ac to engage the Jaguar pair who were due to route about 15nm to the east of NCL in a southerly direction. He visually acquired the pair and commenced his engagement, aware as he did so that he would soon be on minimum fuel

for recovery to base. Once at low level he converted to a position behind the formation and closed on them from astern. After the pair had reacted to his attack, he disengaged and commenced a climb in a south easterly direction whilst contacting London (Mil) for a radar service. He states his position at that time as 25nm SE of NCL, or 16nm from the nearest edge of the NCL zone. The final engagement had taken him towards a shower, and he became IMC at about FL60, climbing at this stage on a minimum fuel state. Initial contact with London (Mil) was 37 secs after disengagement with the pair, and two way comms were established on passing FL70. He was immediately informed of an unknown contact 1nm astern at an unknown height. He had not seen the reporting RJ85 and assumed that the contact would be one of the other Jaguars, who would still be at low level.

The pilot states that it would normally be his policy to contact NCL when in their vicinity. However, when he initiated the climb, he considered that his position and heading would make London (Mil) the more appropriate agency to contact.

UKAB Note (1) The minimum fuel state mentioned in the Jaguar pilot's report is that required to climb from low level, cruise at a

suitable altitude and descend to arrive at home base with the required amount of fuel.

THE JAGUAR PILOT'S UNIT comments that this incident highlights the dangers facing ac pulling up from low level in what may be busy airspace. Although the pilot's decision to call London rather than Newcastle is understandable, a call to the latter may have been more sensible, given the sensitivity of the airspace in their area, and such a call may have prevented the Airprox. Nevertheless, despite being on minimum fuel, the pilot should have established a radar service with London prior to going IMC, and should have allowed sufficient fuel to do so. The "big sky" theory cannot be relied upon and pilots should seek to minimise risks whenever possible. As a result of this incident, all Unit pilots have been reminded of the airmanship requirements for a planned climb, including the need to make a suitable fuel allowance to establish appropriate ATC comms.

HQ STC comments that when they were appraised of this Airprox, the following instruction was sent to all fast-jet Station Flight Safety Officers. "Emphasise to all your Station pilots the necessity to fly VFR in Class G airspace, or to obtain a radar service before going IMC. This may mean allowing extra fuel to deviate from a direct track, or to remain below cloud to obtain the necessary service." A further message was sent to all fast-jet Station Commanders by the Air Officer Commanding in which he emphasised "the need for the highest levels of airmanship and common sense" to be exercised by RAF crews. STC do not believe the Jaguar pilot was exercising good airmanship in this unnecessarily precipitate climb through IMC.

MIL ATC OPS reports that the Jaguar pilot contacted LATCC (Mil) Allocator East at 1411:25. The pilot passed his position as "*thirty miles south east of Newcastle*" and level "*passing seven zero requesting two three five*". The aircraft was identified, placed under a RIS as requested, and given clearance to climb to FL240. This transmission (1411:48) continued "*traffic in your 6 o'clock at one mile, no height information*". The pilot replied "(c/s) 3 I suspect that will be (c/s) 1 and 2 maintaining low level and I'm climbing well ahead of them". A squawk was then allocated and the ac handed to a suitable console.

Analysis of the radar recording shows three fast moving contacts at low level, one of which detaches from the group and at 1410:58 passes a contact squawking 3772 which is maintaining FL70. Mode C on the ac, subsequently identified as the Jaguar, is not observed until after the confliction, at which point it indicates FL72. At the time of first contact with LATCC (Mil), the Jaguar is passing FL77 and the airprox has already occurred. The traffic information passed to the Jaguar is indeed a low level squawk on which the Mode C has dropped out momentarily. As the incident occurred prior to the Jaguar establishing comms with LATCC (Mil), there appears to be no Military ATC involvement with this Airprox.

ATSI reports that the RJ 85 crew established communication with Newcastle Approach, at 1407, maintaining FL90 and heading 320° in order to avoid weather. The Approach Radar controller (APR) placed the flight under a RAS and advised that, once clear of the weather, it would be radar vectored for an ILS approach to RW25 at Newcastle. After instructing the RJ85 to descend to FL70, the APR observed what appeared to be high-speed military traffic manoeuvring to the north/northeast of it and, at 1409:30, advised: *..early warning of military contacts for you currently in your two o'clock at a range of fifteen miles they are all indicating low level over the sea at the moment but they may climb I'll keep you advised.*" The pilot reported that he was IMC and, at 1410:30, advised that the flight could now accept radar vectors. The APR assigned radar heading 315° and then, almost immediately, followed this up with an 'avoiding action' instruction: *..avoiding action one of those contacts climbing left heading two seven zero traffic in your twelve o'clock range of two miles.*" There was no immediate response from the crew but when asked, 17 seconds later, if they had received the message, the pilot commented that it had been *"a little bit late ...the traffic just one hundred feet below us."* The APR went on to explain that: *"he climbed straight out of nowhere he turned and I gave you it as soon as I could."*

Some Newcastle radar data are recorded for noise monitoring purposes, but the unit advise that this encounter was not captured. Therefore, the following observations are based on recordings of LACC radars. Although it appears that, at a late stage, the Newcastle radar did show the subject Jaguar climbing very rapidly towards

AIRPROX REPORT No 102/02.

the RJ85, no Mode C readout is evident on the LACC recordings until after the returns have merged. After the returns separate, the Jaguar is showing a Mode C readout of FL72. During the encounter, the RJ85 climbs from FL70 to FL72, presumably in response to the TCAS RA, but makes no reference to this on the RTF. At 1412:18, when 14.3nm southeast of the RJ85 and passing FL117, the Jaguar's SSR code changes to 6126.

Given the respective flight profiles and circumstances preceding the Airprox, it is not considered that there was much more that the Newcastle APR could have done to help prevent it and accordingly it is not assessed that he is open to criticism. The 'avoiding action' phraseology was not word perfect but it contained the essential elements and it is recognised that the APR had very little time to react.

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 agreed that this incident was one of the most serious Airprox they had seen. In similar fashion, the STC representative re-stated how seriously this incident had been treated within STC and said that a robust directive had been sent to all fast jet pilots in the Command to ensure that a similar occurrence could not happen again. Additionally, a draft amendment to military flying regulations had been raised. There was unanimous agreement that the Newcastle controller had been faced with a very difficult situation and had done everything he could in the circumstances, including employing his own experience to anticipate a sudden climb by the Jaguar. However, as subsequent events showed, the manoeuvring capability and potential for sudden flight path changes in such instances can not easily be countered by a controller, regardless of the type of service being provided.

The issue of cloud penetration whilst not under an ATS was acknowledged to be a long standing one within the aviation community. Questions were asked again concerning the legality of this and the Board established that, whilst there was no known regulation to bar such action, it was hardly appropriate in today's busy airspace; obtaining an ATS before going IMC should be considered a matter of good airmanship and common sense – though it was acknowledged that not all UK airspace is covered by radar. An instruction on this subject had been promulgated to STC crews, and the Board felt that this should be made widely available to all military pilots. Some Board members observed that guidance had been given before, but they were reminded that aviation is a constantly changing "family" and lessons need to be repeated and reinforced from time to time to ensure that corporate knowledge is not lost.

Clarification of the Jaguar's fuel state was sought. It was explained that the Jaguar was not short of fuel but had reached a point in the exercise whereby he had to cease the engagement and climb immediately if he was to land at his base with the prescribed minimum. No fuel emergency had existed and nearby diversion airfields were available should one have been needed (though the Board did not have access to information regarding their suitability on the day).

In determining the cause, the Board considered that the Jaguar pilot had taken an unnecessary risk in climbing from low level into IMC while seeking to establish an ATS, which had compromised his ability to "see and avoid" in Class G airspace. Had he taken time to make contact with and be identified by London (Mil), before climbing through cloud, a different outcome would have prevailed. As it was, the subsequent encounter with the RJ85 was so close that only chance, and perhaps the initial response to TCAS, had prevented a collision. The Board were in agreement that this incident should be widely publicised.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Jaguar pilot made a rapid climb from low level into IMC and into conflict with the RJ85.

Recommendation: The MOD should convey STC’s advice to all military pilots operating in UK airspace and publicise the incident as widely as possible.

Degree of Risk: A

AIRPROX REPORT NO 104/02

Date/Time: 3 Jul 0901

Position: 5748N 0240W (3nm NW of SMOKI)

Airspace: FIR (Class: G)

Reporting Aircraft Reporting Aircraft

Type: Jaguar Pair AS332L2

Operator: HQ STC Civ Comm

Alt/FL: 1000ft 1000ft

(QFE 996mb) (RPS 992mb)

Weather VMC CLBC VMC RAIN

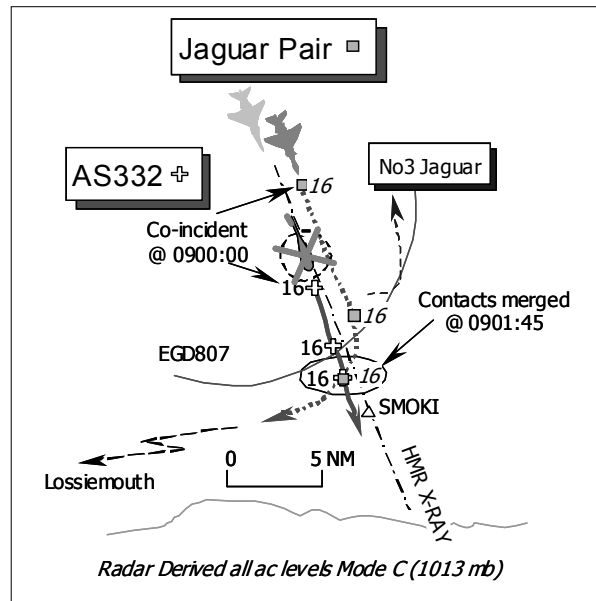
Visibility: 5km 3-5km

Reported Separation:

50m H, 100ft V 100m H, 100ft V

Recorded Separation:

Contacts merged - nil



BOTH PILOTS FILED

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE JAGUAR PILOT, a QFI, provided a laudably frank and comprehensive report, stating he was leading a pair of camouflage grey Jaguars in close formation echelon starboard; he was the Captain in the rear seat of a T2 with a refresher student as PF in the front. Inbound to Lossiemouth at 350kt, he was in receipt of a FIS initially from APPROACH (APP); neither TCAS nor any other form of CWS is fitted. The cloudbase was about 1200ft amsl on recovery, but he remained VMC throughout the incident.

On initial contact with APP, heading 180° at 1000ft Rad Alt, his formation was too low for radar ‘identification’, but the controller informed him of traffic in his area on a similar heading at 1600ft. He checked his height in relation to the SPS of 1013mb and found it to be about 1600ft. At this point he made an erroneous assumption – he

thought that APP could see his formation on their radar display and that the contact they had reported to him was, he thought, his Jaguar formation. This led him to believe, incorrectly, that his formation was the only traffic in the area. About 1min later, while turning R through S, towards Lossiemouth, he spotted a Puma helicopter - coloured red and blue at 2 o’clock low about 300m away - at the same time as the PF. No avoiding action was taken as it was seen too late; they crossed 50m ahead of and about 100ft above the helicopter. Fortunately, he had elected to remain VMC below cloud, rather than climb in IMC below the helicopter route prior to identification and before being placed under a radar service.

He explained that he had made an incorrect assumption, which led him to believe that there

AIRPROX REPORT No 104/02.

was no conflicting traffic; had he been aware that the reported traffic was a helicopter in radio contact with Lossiemouth ATC he would not have made the assumption.

UKAB Note (1): A height of 1000ft Lossiemouth QFE (996mb) would equate to a level of about 1510 ft (1013mb).

THE AS332L2 SUPER PUMA PILOT reports his helicopter has a blue, orange and white livery; the white HISL, navigation lights, red anti-collision beacon and forward facing floodlights were all on whilst southbound at 140kt to Aberdeen from an oil rig. They were flying under a limited RIS from Lossiemouth RADAR (RAD) and the assigned squawk of A3720 was selected with Mode C; neither TCAS nor any other form of CWS is fitted.

The Airprox occurred whilst flying in VMC about 200ft below and 3km clear of cloud, passing through a light rain shower with an in-flight visibility of 3-5km. About 342° ADN 26nm, whilst heading 170°, flying at 1000ft ORKNEY RPS (992mb), RAD reported military traffic 3nm to the NE at 1700ft, which would pass down his LHD side, followed by a report that the other ac was indeed passing down their LHD side. The reported traffic – a pair of Jaguars – was then spotted at a range of 9nm. He rapidly pitched nose down to avoid the jets which passed about 100m close down the port side - 100ft above his helicopter. He asked ATC what height the conflicting traffic was, who replied "1600ft – same height as you". He assessed the risk as "high".

UKAB Note (2): An altitude of 1000ft RPS (992mb) would equate to a height of about 1120ft QFE (996mb).

UKAB Note (3): It would appear that the AS332 crew were following Helicopter Main Route (HMR) 'X-RAY' aligned between WICK and ABERDEEN VORs. The Mil AIP at Vol 3 HOOPs – Annex A UK Civil Procedures pg 2-2 states that:

"HMR have no lateral dimensions...the vertical operational limits are from 1500ft amsl – FL85. However...helicopters may be required to operate below 1500ft amsl. Military operations near HMRs are normally conducted at or below 1000ft amsl...with due regard for civil helicopter operations...".

MIL ATC OPS reports that the RT transcript timings are about 2min 18sec ahead of the radar recording time reference, consequently, the RT timings here have been corrected to the radar recording time for clarity and uniformity. The AS332 crew called Lossiemouth RADAR (RAD) at 0849:32, on handover inbound to Aberdeen squawking A3720 and requesting a RIS. The flight was identified by RAD and placed under a limited RIS "*at the base of radar cover.*" RAD informed the crew that EGD807 was "cold" and issued the ORKNEY RPS (992mb), following which the crew acknowledged "*Orkney 992, maintaining 1000ft.*" At 0900:36, RAD started to pre-note the AS332 to Aberdeen RADAR.

Meanwhile, the formation of 3 Jaguars freecalled Lossiemouth APPROACH (APP) at 0859:29, "*[C/S]...for recovery, 3 aircraft...1&2 pairs GCA, [C/S] 3 will be in trail for GCA.*" At 0859:39, the heading and height of the formation were confirmed as "*...heading 150, climbing fifteen hundred.*" A squawk of A3715 was allocated to the leader of the Jaguar pair and A3714 to the No3 singleton; the leader was requested to report "*...ready for the split,*" which he did at 0900:00. However, at this point, APP advised that he had "*...no radar contact at the moment,*" but added that there was "*...traffic on the advisory route southbound just over 807, approaching the reporting point at SMOKI, indicating 1600 feet.*" To which the Jaguar leader replied that the formation was "*descending to maintain one thousand.*" At 0900:41, the Jaguars were identified by APP, "*...identified limited traffic information from all around due to your height and range Radar Information Service..*" who queried whether the pilots were visual with the surface, which they were. The Jaguar leader then requested a RAS, but this was refused by APP as the formation was flying below the sector safety height. After confirming that the formation was "*... happy to accept a turn...*" the subject pair [No1&2] was advised at 0900:59, to "*... take a heading of 270 initially,*" which was acknowledged.

At 0900:48, RAD interrupted the landline pre-note to report to the AS332 crew - "*traffic NNE of you approximately 3 miles, tracking SE, indicating 1700ft ...believed to be fast jet passing down your left hand side.*" RAD continued with the AS332 pre-note to Aberdeen and on completion, at 0901:40, transmitted "*that traffic now passing behind you same altitude.*" The AS332 crew

reported visual with the pair of jets and asked RAD, "did you notice the altitude as they passed over us?". The controller replied "indicating 1600ft as are you", adding almost immediately, "the same altitude they popped up about NNE of you about 3 miles behind you as I called them the first time...". Whereupon the pilot questioned, "I presume that reported 1600 was a pressure altitude?" RAD answered "indicating on secondary radar exactly the same height [sic] as you". Later the AS332 pilot reported that he would file an Airprox adding that "...they were pretty close to us". RAD reported the details of the Airprox to the ATC Supervisor who ascertained that the formation had been visual with the AS332; this was passed to the AS332 crew at 0903:52. Meanwhile APP attempted to confirm the heading of the third Jaguar however, due to radio problems, this was not accomplished until 0901:43, when the No3 reported "... heading north level 1000feet victor mike" and continued under FIS until turned S for recovery.

[UKAB Note (4): Thereafter at 0902:09, the Jaguar leader reported to APP "We've just had a close [unreadable] with a helicopter that passed about 100ft underneath us about 30 seconds ago", which was acknowledged. The Jaguar leader added that they were still maintaining 1000ft, whereupon APP instructed the pair to climb to 3700ft for the PAR recovery.

Analysis of the radar recording shows the AS332 entering coverage just to the SE of MORAY at 0855:52, whilst 3 contacts are visible in the Clythness area, all indicating below 1000ft (1013mb). These 3 ac subsequently flew SE in a loose formation, slowly catching up the AS332. At 0900:00, the Jaguar leader's squawk changes to A3715, closely followed by the singleton on an A3714 squawk. The pair make a gentle R turn into conflict with the AS332 as the singleton turns onto a northerly heading at 0901:12. The contacts of the Jaguar pair and the AS332 then merge at 0901:45, both indicating 1600ft Mode C (1013mb). Although all the subject ac are shown on the video recording provided by ScATCC (Mil), the Lossiemouth radar might have shown a different picture. The ATSU reports that the coverage of SSR is marginally better than primary radar within the general area of the Airprox [which is >23nm from Lossiemouth], moreover traffic information was passed to the AS332 crew about the Jaguars as soon as a radar response from the

jets appeared on the RAD controller's display, which corresponds with the same time APP was identifying the Jaguars. We would conclude, therefore, that the Jaguars were not displayed on the Lossiemouth SRE until 0900:41 – [about 1 min before the Airprox occurred]. It appears that APP recognised a potential conflict between the Jaguars and the AS332 based on the DRDF trace provided by the Jaguar's RT transmission and passed traffic information relating to the helicopter. The reference to the AS332's Mode C as "...indicating one thousand six hundred feet", though technically correct, may have been misleading and it might have been preferable to have referred to it as "slightly above" (iaw JSP318A 235.145.4) or even "similar level". [UKAB Note (4): The Lossiemouth SRE displays SSR Mode C data as a level related to 1013mb, even below the Transition Altitude.] RAD appears to have responded quickly to a rapidly developing situation and passed traffic information to the AS332 crew in a timely manner. The actions of APP during the identification of the Jaguars was non-standard and appears to have been based entirely on the observation of an assigned SSR code that appeared in the general direction of the DRDF trace. Given that the pilot called on RT below radar coverage requesting an instrument recovery, it might have been more advantageous to ask if the Jaguar leader would accept a climb. This might have enabled earlier identification, given more opportunity to provide both traffic information and avoiding action against the AS332, especially as the Jaguar leader wanted a RAS as soon as the formation was identified. Nevertheless, APP elected to allow the ac to remain at low-level and concentrated his efforts on establishing when they would be happy to make the split as well as effecting co-ordination relating to another pair of ac under his control. Why APP then elected to turn the pair of Jaguars towards the AS332 is unclear. Undoubtedly, APP could have been far more pro-active and should have taken charge of the situation from the moment the Jaguars requested PAR recoveries.

HQ STC comments that there are important lessons to be learnt from this wholly avoidable incident. HMR X-RAY is confusingly marked on RAF FLIP En Route Charts [UK(L)2] underneath advisory route W4D as purely "X-RAY". There is no mention of the HMR and the base of W4D is marked as FL55 between MORAY and SMOKI. Even APP called the helicopter position as "...on

AIRPROX REPORT No 104/02.

the advisory route" instead of mentioning the HMR. As a result of this Airprox, a change to ERCs is being staffed through No1 AIDU, to make the depiction of HMRS here more distinctive.

The Jaguar leader made a sound judgement to stay VMC as the Jaguar ac has no internal aids to allow them to fly safely in formation under IMC, hence, staying VMC whilst awaiting identification is preferable but there was a lack of communication between APP/RAD, and APP/Jaguars. The Jaguar leader should have reported their position to APP on the initial call, or, APP could have requested it. RAD had an accurate reported altitude on the helicopter and could have passed it to APP. APP passed information on the AS332 as *"one thousand six hundred ft"* with no pressure reference. The Jaguar PF in the front seat understood this report as 1600ft ALT amsl and called descending to 1000ft - to avoid the helicopter. APP did not comprehend the mistake being made. The Jaguar captain PNF understood *"indicating one thousand six hundred ft"* to be a flight level, but assumed the reported traffic was themselves. If APP had said *"...helicopter traffic"* rather than just *"traffic"* then the Jaguar captain may not have made his false assumption. The two Jaguar pilots in the T2 did not communicate their different air pictures to each other, this resulted in the loss of situational awareness by the Jaguar PNF leader in thinking that he was the only traffic in the area. APP identified the Jaguar pair from SSR, but did not then ask them to climb above the sector safe altitude to give the RAS they had asked for and then proceeded to turn them into conflict with the AS332.

The AS332 pilot reported that his helicopter had a blue, white and orange livery. Coupled with a red anti-collision beacon, navigation-lights, forward-facing floodlights and the reported 5km visibility in rain below a 1200ft cloudbase, it is not surprising that the Jaguar crew did not see the AS332L2 until very late. The lessons above are solely the result of Human Factors that can be summarised as - *ensure that the information passed is accurate and if in doubt - ask*. This Airprox should be used as an example to aircrew and controllers of how accumulated small errors can lead to dangerous situations. Poor communication, assumptions, and lack of positive control all contributed to build this Airprox.

Ultimately, this might have been avoided if the altitude of the AS332 had been reported as such by APP and had not been confusing. As required in JSP318A 905.100.3 *"..care must be taken not to confuse or prejudice basic meanings"*. Alternatively the above/below method highlighted by STC ATC should have been used. However JSP318A is not very clear on avoiding the dangers of confusing altitudes and FLs, therefore, it is recommended that the STC Flight Safety and Ops Support ATC offices jointly revise the clarity of the guidance in JSP318A.

THE AS 332L2 OPERATOR comments that the helicopter commander had elected to fly at 1000ft to enable a VFR recovery to be made at his destination, Aberdeen. This is in accordance with UK AIP ENR 1-15 2.3.4 Aberdeen – Atlantic Rim (West of Shetland operations), which specifies that HMR X-RAY is a bi-directional route between Aberdeen and Wick – Northbound at 3000ft ALT; Southbound at 2000ft ALT to SMOKI. However, the UK AIP Note at ENR 2.3.4.3 adds that under certain meteorological conditions helicopters may operate at lower altitudes. An IFR routing for the ILS to RW34 would have significantly extended the flight; for VFR recovery, VFR flight has to be established & maintained before reaching & crossing the coast inbound. In this case, the flight had been established at 1000ft ALT for the latter part of this sector.

The Aberdeen 0850 METAR on the day gives a surface wind of 340/08; 30km in nil weather; FEW @1500ft, BROKEN @4000ft; +14, +10 QNH 997mb. Thus the decision to route to the field VFR was reasonable, as the weather inland was markedly better than that experienced en route.

This was obviously a very high risk event for all parties involved. We await the deliberations of the UKAB and will study them to see if the guidance to crews needs to be reviewed.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available to the UKAB 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 authorities.

The Board endorsed the change to RAF FLIP ERCs, staffed by HQ STC to make the depiction of the HMRs more distinctive on charts, although it did not appear to be a factor here and the Jaguar crew was cognisant of the subject HMR. Members noted the AS332 Super Puma crew had elected to fly 500ft below the promulgated lower level of HMR X-RAY – 1500ft amsl. Notwithstanding the caveat that "...helicopters may be required to operate below 1500ft amsl" in the Military AIP, members thought that military crews would fly outside the HMR expecting participating rotary traffic to be within it – not as occurred here. Nevertheless, this was Class G airspace and the AS332 pilot's company had explained why the crew had done this, but it seemed to some members to be 'corner cutting' to save time/fuel. The point to be realised was that any 'protection' they thought might be afforded by flying in a promulgated HMR was immediately nullified. The risk was the AS332 crew's to take and to mitigate it somewhat they had obtained a limited RIS from Lossiemouth RADAR, who had provided traffic information on the Jaguar pair. Thus, the Super Puma crew and the Jaguar crew were mutually responsible for sighting traffic and maintaining appropriate separation from it; here with the jets approaching rapidly from abaft the beam it was very fortunate that the Puma crew saw the Jaguar pair when they did.

The HQ STC fast-jet pilot member explained his concern over the regulations contained in JSP318A relating to the vertical levels of reported traffic. The use of height (QFE); altitude (QNH/RPS); or Mode C level related to the Standard Pressure Setting (1013mb), should be more clearly proscribed. He believed current guidance was imprecise and was a significant factor here. Following the transmission of traffic information from APP about the Puma "...traffic on the advisory route southbound just over 807, approaching the reporting point at SMOKI, indicating one thousand six hundred feet", the Jaguar leader in the rear seat of the T2 – the PNF – reports that he had made a mental calculation that had instilled in his mind an erroneous assumption that his formation was the only traffic around. Some members were surprised at this 'double-guessing' by the Jaguar PNF, but recognised the plausibility of what he had done. The trap was that he was not then pre-disposed to checking with APP exactly what the traffic information related to. However, others thought

that APP had clearly related in the phrase "...traffic on the advisory route southbound" that it was another ac. Here the members concurred with HQ STC, that APP had used inappropriate terminology, referring to the ADR instead of the HMR and that this had been a contributory factor in this Airprox. The aim with traffic information here was to paint the 'whole' picture, without room for any ambiguity. If APP had been more precise with the traffic information and included that it was a helicopter below the HMR at an altitude of 1000ft, or referenced it to the Jaguars' height, this Airprox might not have occurred. Furthermore, it was revealed that there had been a lack of communication in the Jaguar cockpit between the front seat student PF and the captain PNF in the back, which was a salutary lesson in CRM. Independently, the student PF, who was working the radio, had formed another mental picture and had elected to descend to a height of 1000ft to remain clear of the traffic reported at "...SMOKI, indicating one thousand six hundred feet", thereby intending to avoid the helicopter, he thought by 600ft, whereas at an altitude of 1000ft the Puma was merely 120ft above the jets' height of 1000ft QFE. The lesson was that neither pilot had communicated with each other and in the end each had a different air picture that stemmed from a description of traffic information that included an unqualified 1600ft. Constantly being aware of the differences between the various barometric altimeter pressure datums and the ability to relate this clearly and accurately within traffic information provided to pilots, was a basic ATC skill and technique. This aspect is amplified in JSP 318A [235.145.2-3 & 915 serial 5], which reinforces that clarity is essential. Controller members said they would have specified the traffic information more usefully as a height or altitude as appropriate to convey a more accurate picture to the Jaguar crew in an easily understandable form. The Board agreed that the controller's inexactitude was part of the cause, insofar as APP had passed misleading traffic information to the Jaguar leader, about the AS332's vertical position.

In the mistaken belief by the PNF that they were the only ac in the vicinity - and by the front seat PF that they were 600ft below the 'other' traffic - the lead Jaguar crew accepted APP's turn instruction onto 270°. Acceptance of this instruction was implicit if the Jaguar pair was to be vectored into the PAR pattern, but the Mil ATC Ops advisor was

AIRPROX REPORT No 104/02.

at a loss to explain why APP had done this knowing the helicopter would conflict. Pilot and controller members alike were aghast that the controller could have done so without clarifying if the Jaguar crew could see the helicopter. Whilst the Jaguar crew had asked to upgrade the ATS, members understood why APP had not acceded to the request for a RAS, if the controller could not see the ac on his display; the Mil ATC Ops report had explained that an earlier climb might have been more appropriate. Notwithstanding the RIS that pertained - where pilots are responsible for their separation from other traffic and that the crew had not requested an update on the traffic - members thought it had been most unprofessional of APP to turn the Jaguar pair toward the AS332, without confirming that the PF could effect his own separation. If the controller had done this first, the Airprox would not have occurred. Consequently, the Board determined that the other part of the cause was that Lossiemouth APPROACH vectored the Jaguar pair into conflict with the AS332.

Evidently the lead Jaguar crew only spotted the helicopter at a range of 300m, when no avoiding action was feasible; they crossed 50m ahead of and about 100ft above it. The Board recognised that this vertical separation reported was similar to the difference between the respective QFE/RPS pressure references used, which suggested to some that an actual risk of collision had existed. Although, the vertical separation reported by the AS332 pilot was the same, he thought he had influenced this when he instinctively pitched nose down as the Jaguar pair passed 100m down his port side. This geometry was slightly at variance with that shown on the radar recording, which showed the Jaguar pair crossing from L-R in the turn as the contacts merged at the same indicated level of 1600ft Mode C (1013mb). Noting that the No2 Jaguar was in echelon starboard to the lead ac and therefore, closer to the Puma, the Board agreed it had certainly been a close call. At these speeds, members postulated that the helicopter pilot had about 5sec to effect a change in his flightpath which apparently he did, leading the Board to conclude by a narrow majority that a collision had been averted, but that the safety of the ac had been compromised.

The Board recognised that military controllers must be punctilious when passing height/altitude/level traffic information, and understood the view

expressed by the HQ STC Flight safety member that the guidance given within JSP318A might not be as specific as it could be. The aim was clear, accurate and prompt transmission of traffic information so that pilots could sensibly make use of it in the time available. If controllers and pilots did not comply with the basics of altimetry and refer to height with respect to QFE, altitude with QNH and FL with the SPS, then this Airprox was indicative of what could seriously go wrong. This incident was not necessarily symptomatic of a more widespread trend, but the Board endorsed the recommendation; that the MOD considers, through HQ STC Flight Safety and Ops Spt ATC, a review of the guidance promulgated to military controllers in JSP318A, about expressing the vertical position of ac by reference to the appropriate height/altitude/flight level datum when included within traffic information.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause:

- a. Lossiemouth APPROACH vectored the Jaguar pair into conflict with the AS332.
- b. Lossiemouth APPROACH passed misleading traffic information to the Jaguar leader about the AS332's vertical position.

Degree of Risk: B.

Contributory Factors:

- a. The Jaguar captain's (PNF) erroneous assumption that his formation was the only traffic in the vicinity following receipt of the traffic information from APPROACH.
- b. The misleading terminology used by APPROACH, when referring to an ADR instead of an HMR.

Recommendation: That the MOD considers, through HQ STC Flight Safety and Ops Spt ATC, a review of the guidance promulgated to military controllers in JSP318A, about expressing the vertical position of ac by reference to the appropriate height/altitude/flight level datum when included within traffic information.

AIRPROX REPORT NO 105/02

Date/Time: 3 Jul 1820

Position: 5222N 0317W (8nm NNW RADNO)

Airspace: CTA A25 (Class: A)

Reporter: LACC S5/8/23

First Aircraft Second Aircraft

Type: E145 DHC8

Operator: CAT CAT

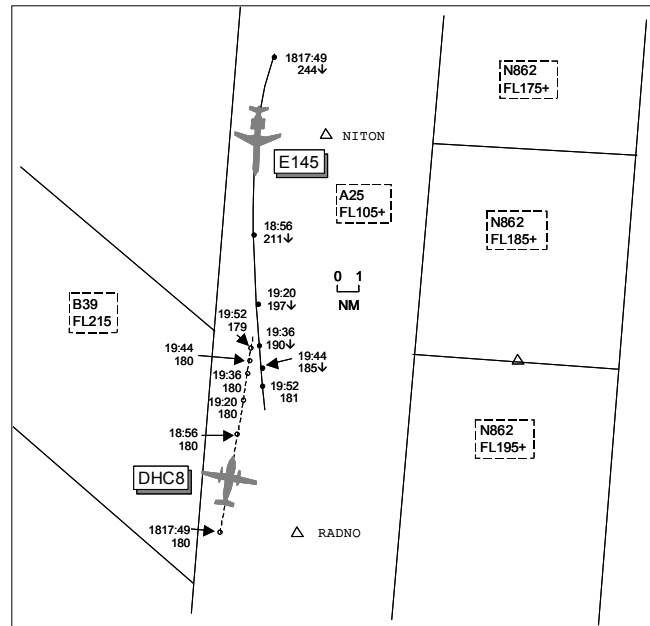
Alt/FL: ↓ FL190 FL180

Weather VMC CLOC VMC CLOC

Visibility: >10km 50km

Reported Separation:
NK 100ft V 0.6nm H

Recorded Separation:
500ft V 0.6nm H

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

THE LACC S5/8/23 TACTICAL CONTROLLER reports that the E145 was given a radar vector to separate it from other traffic and was then given descent clearance to FL190 to remain above opposite direction DHC8 traffic at FL180. Subsequently, when descending through FL250 the E145 was released on its own navigation to TALGA. STCA activated as the E145 descended through FL230. The E145 pilot requested further descent as he descended through FL210 and was told to *"maintain on reaching traffic to cross"*, which he acknowledged. The Embraer pilot then advised that he was taking a TCAS RA descent, the radar returns were seen to merge, with him then reporting clear of traffic having *"missed"*. The Mode C labels were by now showing FL180 (DHC8) and FL181 (E145) and a brief conversation with the DHC8 pilot revealed that he too had received a TCAS RA.

THE E145 PILOT reports flying inbound to Bristol at 300kt in the descent to FL190. Approx 24nm N of TALGA descending through FL197, he received a TA alert which quickly became an RA *"descend, increase rate of descent"*, he thought. He, the Capt and PF, alerted the FO/PNF to the RA alert, and whilst following its guidance he quickly saw the conflicting traffic visually. Meanwhile, TCAS

now gave an RA *"climb"*, which he followed as the other ac passed down his starboard side, and he advised ATC that he was returning to his assigned level.

THE DHC8 PILOT reports heading 010° at 210kt in the cruise at FL180 when he received a TCAS TA on opposite direction descending traffic 10nm ahead 2000ft above. He visually acquired the traffic about 2-3nm away still descending but regarded this as a low risk as it was about to pass to his R with a decreasing ROD. As the traffic passed abeam - he estimated about 0.6nm away - TCAS annunciated *"monitor vertical speed"* then *"descend descend"*, demanding a ROD of 2000fpm, followed almost immediately by *"clear of conflict"*. During this TCAS encounter, the FO/PF disengaged the A/P and commenced a descent as he switched on the seat belt signs. He was unable to inform ATC immediately of his TCAS manoeuvre (down 150ft), owing to RT congestion, only telling them later after regaining FL180. The other ac's pilot was heard to advise ATC that despite flying above his ac, he had received an RA descent.

THE E145 FLIGHT SAFETY DEPARTMENT comments that initial investigation shows that the

AIRPROX REPORT No 105/02.

TCAS RA received was *"monitor vertical speed"* with a green arc from 0-2500fpm. The A/P was disengaged and apparently the conflicting ac was searched for by both pilots. As the ac reached FL184 the TCAS RA strengthened to a *"climb"* and during the RA demanded change, the conflicting ac was seen visually in a position corresponding to that indicated from the TCAS display. It was concluded that the pilot's initial RA response was unintentionally not in accordance with the display guidance which resulted in a deviation below the cleared level. A Flight Operations review identified a lack of clear guidance in the Operations Manual Part A as to the required method of manoeuvre following a TCAS RA, the procedures which have been subsequently amended and promulgated.

ATSI reports that the incident took place 8nm NNW of RADNO reporting point within the confines of Airway A25, Class A CAS. The two flights involved were on opposite direction tracks: the E145 was inbound to Bristol from Glasgow while the DHC8 was outbound from Bristol, en route to Newcastle. Both flights were being provided with an Area Control service by the LACC Tactical controller (SC) operating Sectors 5, 8 and 23 in banded mode. Though the sector was assessed as busy, both the SC and the Planner controller considered the traffic level well within their capabilities.

The DHC8, northbound, had been positioned on the W side of airway A25 and had reached FL180, its cruising level. At 1814:23, the E145, southbound, established communications with the sector, reporting at FL270. To facilitate this flight's descent through traffic at FL260, the SC placed it onto a radar heading of 200°. This would also take it to the west side of the airway. At 1815:40, the E145 was instructed to descend to FL190, above the DHC8 at FL180, opposite direction; the descent clearance was correctly read back by the pilot of the E145. The DHC8, meanwhile, had been released on its own navigation to MONTY, a reporting point some 50nm to the N on the airway C/L. At 1817:53, the E145 was also instructed to resume its own navigation, in this case direct to TALGA, on the airway C/L, 54nm to the S. By this time, the radar recording shows, the subject flights were about 20nm apart, on opposite direction tracks which were slowly converging as each flight had now turned towards its respective reporting point. Moments later, it is reported, STCA

activated a warning between the two flights. The SC recalls the event occurring as the E145 was descending through FL230. Knowing that the E145 was only cleared to FL190, the SC might reasonably have taken this to be a 'nuisance' alert, nevertheless, at 1818:57, when the E145 was passing FL210, the SC transmitted *"(c/s) further descent ten miles traffic to cross call you back"*. Although a little vague, this statement should have emphasised that the flight should not descend below FL190. The SC's plan was to issue the E145 with descent below FL190 once it had passed the DHC8 and the required radar separation had been achieved. The Mode C height readouts of the E145 indicate that the ac was descending at a rate in excess of 3500fpm during this period. When the E145 was passing FL197 Mode C (1819:20), the DHC8 was in its 1230 position at a range of 4nm, maintaining FL180. At 1819:36, when the E145's Mode C was indicating FL190 and the DHC8 was at a range of 1.4nm in its 1 o'clock position, the pilot of the E145 transmitted *"(his c/s)'s er TCAS descending"*. The controller acknowledged the report, as required by the MATS Part 1 SI relating to TCAS – 03/2001, para 6, but added *"...er just a little bit of spacing for the computer I'll call you back"*. It is not clear from either the controller's written report or the Unit report what the controller meant by his response, however, it is apparent that he was unable immediately to determine what was happening as the TDBs of the two flights were overlapping, thus preventing an interrogation of the Mode C height readout. During the course of the SC's response, the E145 continued its descent below FL190, passing starboard to starboard with the DHC8. Minimum separation, observed on the radar recording at 1819:44, was reached when the E145 was 0.6nm to the E of the DHC8 and 500ft above, as the former was descending through FL185. Almost immediately the pilot of the E145 reported *"clear of conflict"* and climbing (again) to FL190. By now the tracks of the two flights were diverging, each in the other's 5 o'clock position with the E145 indicating at FL181 and the DHC8 at FL179 for one sweep only before returning to FL180. Observing that the two ac had now passed, the SC responded to the E145's report by clearing this flight to descend to FL110. The pilot of the other flight, the DHC8, then reported *"...we've just had er TCAS descent from the traffic that just passed us er and er maintaining now one eight zero it er went off very quickly"*. The SC then

called the E145 and the following exchanges took place:

LONDON *Okay according to my strips (fps) you're descent clearance was one nine zero*

E145 *Er (c/s) yeah affirm we had a TCAS er RA er at nineteen point five giving us a descent*

LONDON *Okay nineteen point five the traffic below you was one eight zero confirm*

E145 *Affirm yes it was*

LONDON *Strange er TCAS alert okay descend flight level one one zero...(controller then advises he will have to file a report)*

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members noted the reported discrepancy on TCAS indications - as perceived by the E145 pilot at the time and then subsequently by his Flight Safety Department - and so tried to unpick events to explain why the E145 had descended into conflict with the DHC8, which had caused the Airprox. One possibility was that the E145 pilot might have disconnected the AP, soon after receipt of the TA or in anticipation of or during receipt of the RA that had quickly followed. This would have disabled the altitude capture Mode and, instead of the ac's ROD reducing automatically to level-off at FL190, the steep descent would have been maintained. From the E145's Flight Safety Department analysis, the RA alert had then advised a ROD of <2500fpm and members wondered why, if this was the case, the pilots (both involved by this stage) had continued going down at 3500fpm. There were two possibilities. One was that the crew may have been distracted momentarily in looking out for the other ac visually; the other was that one or both pilots had misinterpreted their displayed TCAS indications. Whatever the reason, the ac had continued descending through FL190, the ATC cleared level and eventually the TCAS advice had

changed to 'climb'. This was too late to comply with their ATC clearance, but essential still to avoid the DHC8, which the Capt had by then acquired visually. From the information available and contrary to what had been reported initially, it seemed to members that TCAS had worked 'as advertised', but, for whatever reason, the crew had misinterpreted the guidance, leading them to descend below FL190.

Turning to risk, the SC had executed his plan to provide vertical separation between the subject ac until they had passed. However, it appears from his response to the E145 pilot's call "TCAS descending" that he had misheard this transmission and had taken it as a request for further descent - the ac were quite close together with the E145 descending through, not levelling as he thought, at FL190. Probably, with the degree of label overlap at this stage, the controllers may not have noticed the E145's 'level bust' so his response was pertinent as he would have been waiting for the ac labels to declutter and to ensure the ac had safely crossed before issuing further descent clearance. At about the same time the DHC8 had received a TA warning which had alerted the crew to the E145's presence. They acquired the Embraer visually, 2-3nm ahead, and had watched it pass to their R above but descending; their subsequent RA 'descend' occurred as the ac passed abeam still descending. The E145 crew's actions had allowed their ac to descend towards, and pass close to, the DHC8, which they saw visually, eventually levelling FL181 after passing. Although the subject acs' flight paths meant that they were never going to collide, the Board agreed that E145 crew's actions had placed the subject ac in such close proximity to the extent that safety had been compromised.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The E145 crew descended below their cleared level having misinterpreted TCAS guidance.

Degree of Risk: B

Recommendation: The CAA gives wide publicity to this incident and the lessons to be learned.

AIRPROX REPORT No 106/02.

AIRPROX REPORT NO 106/02

Date/Time: 4 Jul 1259

Position: 5600N 0255W (6nm W of East Fortune Aerodrome)

Airspace: UKDLFS/FIR (Class: G)

Reporting Aircraft Reported Aircraft

Type: Tornado GR 4 C152

Operator: HQ STC Civ Trg

Alt/FL: 810ft 1000ft ↑
(Rad Alt) (QNH)

Weather VMC CLOC VMC CLOC

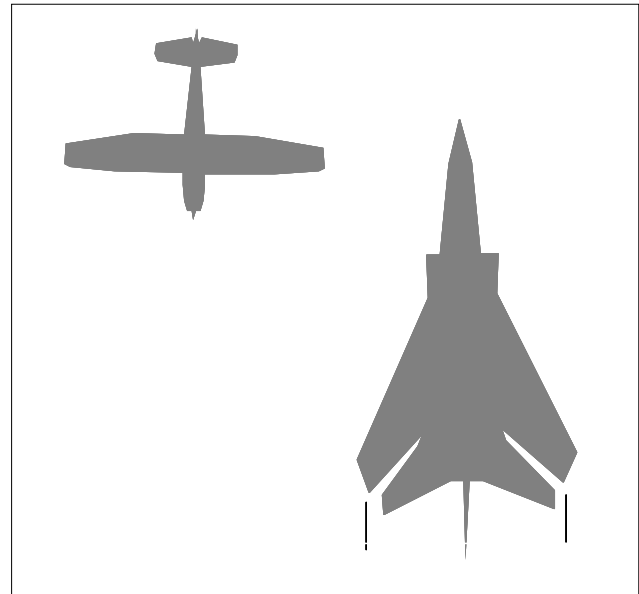
Visibility: 40km+ 10km+

Reported Separation:

150m H 200m H, nil V

Recorded Separation:

Not recorded



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE TORNADO GR4 PILOT reports that he was leading a formation of 4 ac that were egressing from a high workload tactical training exercise. Although in contact with an AWACS ac he was not receiving an ATS; all four GR4s were coloured in standard camouflage. His HISLs, transponder (with tactical squawk) and Mode C were all on, but TCAS was not fitted. In order to deconflict with other known exercise traffic the formation was flying not below 750 ft agl. He was flying out of sun, with "excellent" visibility and about 2000 ft below cloud when he sighted a high wing ac, believed to be a Cessna, which was coloured white with red / blue stripes. He had just rolled out from a gentle right turn and the other ac appeared in his field of view from behind the canopy arch. First sighting distance was about 150m, as the other ac passed abeam on his left hand side and slightly below. No avoiding action was possible in the time available, but he called the threat to the formation and the No 4, who was following some distance behind, pulled up to remove any conflict.

THE C152 PILOT reports that he was engaged in a low level handling exercise with the student occupying the left hand seat. The visibility was >10km, with an overcast cloud layer at about 3000 ft. His ac was coloured white overall with red and

blue fuselage stripes. Navigation lights, anti-collision beacon and the landing light were selected on. Neither a transponder nor HISLs were fitted. At the time of the incident he was not in receipt of an ATS, but had recently selected Edinburgh Approach frequency prior to making an initial call.

After flying in a westerly direction at 500 ft MSD he turned south and commenced a climb with the intention of routeing through Edinburgh CTR. At about 1000 ft amsl he saw a Tornado through his port window, passing in the opposite direction, straight and level at the same altitude and about 200m away. Suspecting that the Tornado was probably part of a formation, he continued to "climb and weave" whilst visually acquiring three more Tornados which passed well clear. Avoiding action on the first Tornado was not taken as it was already passing abeam his ac when first seen. He comments that the approaching Tornado would have been obscured by part of his instrument panel, which restricted forward visibility with the ac in the climbing attitude. As he was in the RHS, his view ahead and to the left of the ac would have been further degraded. The restricted forward visibility in such circumstances had already lead his company to establish a procedure to weave

whilst climbing. He assessed the risk of collision as "high"

UKAB Note (1): This Airprox occurred outside the coverage of recorded land based radar. Recorded data from the AWACS confirms the formation's routing but does not show the Cessna or the Airprox itself.

THE TORNADO PILOT'S UNIT comments that from the Tornado pilot's perspective, the Cessna would have been hidden beneath the nose of the ac as a result of both the Cessna's climb from below and the slight right turn of the Tornado. The Cessna would not have been visible to the Tornado crew until its relative movement placed it in the left quarter light. This may well have been only a few seconds before the Airprox and even then the Cessna may have been hidden from view behind the canopy arch until it bloomed to a noticeable size. The crew therefore, had little time to spot the Cessna and take avoiding action.

This was a close Airprox which occurred as a result of both pilots being unsighted due to their relative position and the climbing attitude of the Cessna. The very nature of fast jet operations at low level reduces the likelihood of conflicts from below, but in the vicinity of light ac strips and when flying above 500ft MSD a conflict from below becomes an increasing possibility. Pilots flying at any level should be aware of the possibility of other ac posing a potential threat from below and all-round lookout is therefore essential. The responsibility for good lookout under VFR requires pilots to ensure that their flight path is clear. If the ac attitude or cockpit obstructions make this difficult then either the head or the ac need to be moved at frequent intervals to ensure that lookout is effective.

HQ STC concurred with the comments of the Tornado pilot's unit.

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.

Both pilots' reports and separation estimates were very similar, enabling the Board accurately to reconstruct the encounter. While both pilots would have been presented with obstructions to visibility during the latter stages, it was felt that the opportunity to see each other would have existed, and been practical, when the ac were further apart, and that the physical restrictions could not be held solely responsible for the late sightings. The aspect of the two ac was certainly a factor in making sighting more difficult, but it was felt by some members that the lack of relative movement was less so. The Chairman observed that all the factors taken together, particularly that of aspect, were all too often common features in Airproxes where two ac came close to each other in good weather conditions.

Although the Tornados were flying higher than the normal low level operating heights for deconfliction purposes, they would in any case have pulled up to a similar level when crossing a coastline, in order to reduce the bird strike risk. Light ac operators should therefore be aware that, in the vicinity of coastlines, fast jet ac may be encountered at higher heights than may be expected.

Neither pilot had influenced the final separation distance which had been a product of chance in the end. This persuaded members that a risk of actual collision had existed.

PART C: ASSESSMENT OF CAUSE AND RISK

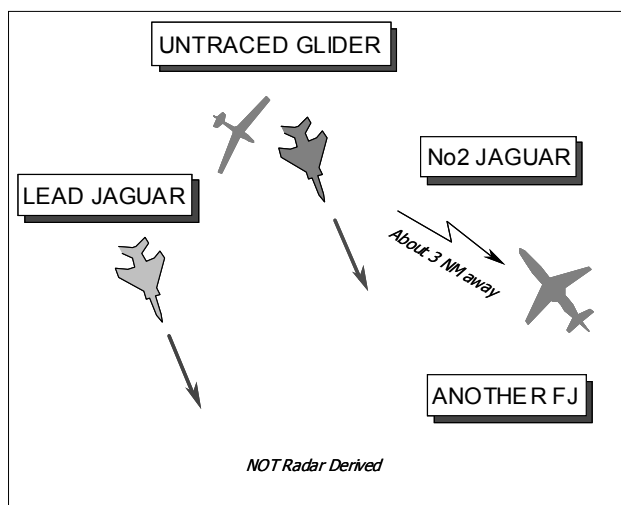
Cause: Effectively, a non-sighting by both pilots.

Degree of Risk: A

AIRPROX REPORT No 107/02.

AIRPROX REPORT NO 107/02

Date/Time: 06 Jul 1413 (Saturday)
Position: 5117 N 0132 W (3½ NM S of Rivar Hill - elev 730 ft)
Airspace: UKDLFS/London (Class: G) FIR
Reporting Aircraft Reported Aircraft
Type: Jaguar Untraced Glider
Operator: HQ STC Unknown
Alt/FL: 500 ft Unknown
agl
Weather VMC CLBC Unknown
Visibility: 20 NM + Unknown
Reported Separation:
150 ft (H) nil V Unknown
Recorded Separation:
Not recorded



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE JAGUAR PILOT reports his ac has a grey camouflage scheme, but HISLs were on, whilst flying as the No2 of a two ship formation engaged in a firepower demonstration over Salisbury Plain Training Area within LFA1. He was in RT communication with an A/G station and also "listening out" with Boscombe Down, but was not in receipt of any form of ATS; a squawk of A7001/2 was selected with Mode C but neither TCAS nor any other form of CWS is fitted.

Flying at 500 ft agl in wide battle formation with his leader to starboard at a range of 2 NM, heading 170° (T) about 3¾ NM S of Rivar Hill gliding site at 450 kt after a formation split, he was watching his leader at 2 o'clock to maintain his timing for their part in the demonstration and also watching another fast jet in his 10 o'clock about 3 NM away. Just as he transferred his attention back to the lead ac he spotted a white glider in his 4 o'clock about 150-200 ft away heading SE at the same height. He saw the glider too late to take any avoiding action. The glider was a 2-seater – possibly a K13 – which might have had a blue tail. He assessed the risk of a collision as "high".

UKAB Note (1): None of the recorded LATCC radars illustrate this Airprox, which occurred outwith their coverage.

UKAB Note (2): The UK AIP at ENR 5-5-1-4, promulgates Rivar Hill Glider Launching Site for winch launches where cables may be encountered to 3000 ft agl, during daylight hours, throughout the week. Additionally, the UK Mil AIP at Vol 3 Pt 1-2-1-3 – G01, specifies a mandatory 1.5 NM avoidance area around Rivar Hill up to 3000 ft agl.

AIS (MIL) report that despite extensive tracing action involving many glider sites/clubs and the good offices of the BGA, they have been unable to ascertain the identity of the reported glider.

UKAB Note (3): Tracing action was terminated by the UKAB on 4 Dec 2002, five months after the Airprox. Therefore, the reported glider remains untraced.

THE JAGUAR PILOT'S UNIT comments that the congested airspace around Salisbury Plain Training Area (SPTA) gives fast jet crews a number of challenges that are carefully briefed prior to each sortie. The proximity of a variety of civilian flying operations to SPTA mean that there will always be a confliction between lookout and cockpit tasks in this area. This Airprox took place at a time when the Jaguar pilot's workload was particularly high as he prepared for a firepower

demonstration in front of a large high profile audience. Moreover, gliders are notoriously difficult to acquire and consequently the glider was seen at a very late stage.

HQ STC comments that fast-jets do not train routinely in the Salisbury plain area due to the congestion and restriction of the airspace. However they do operate in the area when requested to support Army exercises. It is essential that all ac operating in this congested airspace maintain the utmost vigilance and lookout at all times.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included a report from the No2 Jaguar pilot alone and a report from the appropriate operating authority.

It was unfortunate that the identity of the reported glider had eluded AIS (Mil), because without the other pilot's report the picture of what had occurred was incomplete. The Board recognised that the military activity conducted here was possibly unusual for a summer weekend, which made the chances of an encounter with sporting aviators all the more likely – a salient point to be borne in mind when planning sorties such as this. Although Rivar Hill was only 3¾ NM N of the Airprox location, and flight in the vicinity of a glider site clearly increases the chances of an encounter with such ac, there was no evidence to suggest that the untraced glider the Jaguar pilot saw had either departed from, or, was returning to this site. Indeed the tracing action conducted by AIS (Mil) had shown this was probably not the case. However, the Jaguar pilot's report, indicating the untraced glider's height was 500 ft, surprised some members who thought this unusually low; its pilot might have been attempting to land in the

area away from Rivar Hill, but without a report this was pure conjecture.

The Board concurred with the Jaguar pilot's unit that the small cross-sectional area, size, white colour scheme and aspect of the relatively slow glider was not conducive to early visual acquisition in the complex scenario described here. The No2 Jaguar pilot was apparently concentrating on his formation leader for timing, which, compounded by the relative position and direction of another jet flying towards his ac in this high workload phase of sortie, conspired to distract his attention at the critical moment. Hence he did not see the glider at all until after he had flown past it and the Board concluded the cause of this Airprox was, effectively, a non-sighting of an untraced glider by the No2 Jaguar pilot.

Turning to risk, the Board recognised that whatever separation had existed, had been by chance. A fast-jet pilot member suggested that if the confliction had been more acute and the glider even closer to the jet's flightpath, then it would have been more apparent to the pilot of the No2 and he would have seen it. But this was a solitary view that did not engender support. Unfortunately it was not feasible to obtain any independent corroboration of the reported separation distance without radar data; clearly they had missed each other - but not by much. The Board concluded, therefore, that the safety of the subject ac had indeed been compromised.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Effectively, a non-sighting of an untraced glider by the No2 Jaguar pilot.

Degree of Risk: B.

AIRPROX REPORT No 108/02.

AIRPROX REPORT NO 108/02

Date/Time: 8 Jul 0928

Position: 5200N 0123E (5nm South of Woodbridge)

Airspace: London FIR (Class: G)

Reporting Aircraft Reported Aircraft

Type: Gazelle AH1 Robin HR200

Operator: HQ JHC Civ Trng

Alt/FL: 500ft 900ft

(Rad Alt) (QNH 1008mb)

Weather VMC VMC Drizzle

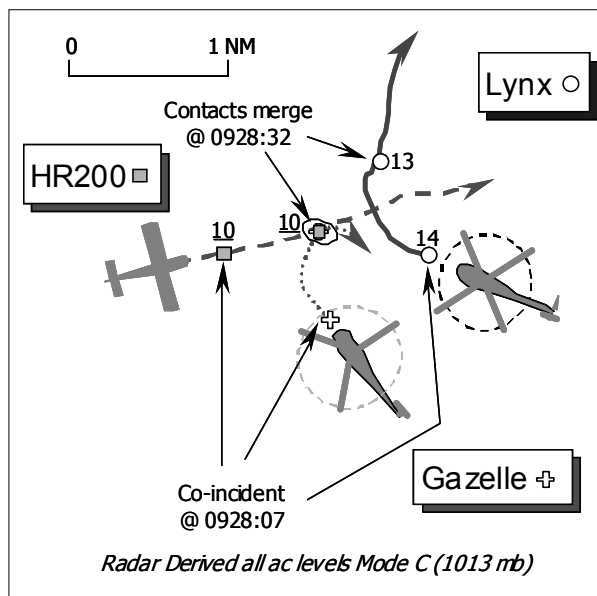
Visibility: 9km 4km

Reported Separation:

150m/30ft V 2-300m H/50ft V

Recorded Separation:

Contacts merged



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE GAZELLE PILOT, a QHI, provided a very frank report, stating his helicopter has a grey/green camouflage scheme, but the HISL was on whilst he was flying a general handling sortie 5nm S of Woodbridge. He was in receipt of a FIS from Wattisham and squawking A4522, but neither Mode C, TCAS, nor any other form of CWS is fitted. Heading 035° at 70kt, whilst climbing out from a practice forced landing (PFL) passing 400ft agl, a Lynx helicopter was seen at 1 o'clock - 2nm away he thought - flying at 1000ft agl and crossing ahead from R - L. Moments later whilst approaching 500ft agl in the climb, a light fixed wing ac - white with red & blue stripes - was suddenly spotted in his 11 o'clock about 200m away crossing from L - R. To avoid the fixed wing ac he turned hard R into a descending turn, but he thought no avoiding action appeared to have been taken by the pilot of the Robin, who passed about 30ft above and 150m to port of his helicopter. He assessed the risk of a collision as "very high" and added that he had been distracted by the sighting of the Lynx helicopter.

THE ROBIN HR200 PILOT, a flying instructor, provided a very comprehensive report, stating his ac colour scheme is red white & blue and the navigation lights and HISL were on whilst conducting an instructional sortie in

communication with Earls Colne A/G Stn. A squawk of A7000 was selected with Mode C. At the time of the Airprox his workload was low with nothing to compromise lookout. The student was flying the ac at 85kt at an altitude of 8-1200ft in a series of turns, he thought, predominately to the L to fix his position. During one of these turns he spotted a military helicopter at 1-2 o'clock about 300m away and 100ft below his ac flying from R - L, which seemed to be climbing in a level attitude. He took control of his ac from his student for a few seconds and initiated a climb whilst also increasing the rate of turn to the L to avoid the helicopter, which passed about 2-300m away and 50ft below his ac. About a second or two after pointing out the helicopter to his student, he saw the helicopter manoeuvre quite abruptly - presumably into avoiding action.

He opined that the risk of a collision was "low", but on reflection, he thought that several factors led to their late sighting. When his ac was in a L bank, it would have presented a white-grey underside to the helicopter crew. Furthermore, the single HISL is mounted centrally on the top of the fuselage - quite possibly obscuring it from the helicopter below, whilst above his ac was a grey stratus overcast. From his ac - in a L turn - the helicopter would most likely have been beneath the Robin's

nose impeding visual acquisition and the camouflage colour scheme is deliberately low conspicuity.

While this incident was too close for comfort and despite unfavourable circumstances, the principle of 'see and avoid' had worked.

UKAB Note (1): The Debden radar recording shows the Gazelle manoeuvring before turning northbound at 0928:07, as the Robin approaches from the W level at 1000 ft Mode C (1013 mb). Simultaneously, the Lynx helicopter referred to by the reporting Gazelle pilot is shown NW bound at 1400ft Mode C (1013mb) – above the ac involved in the Airprox. The Gazelle and Robin converge as the helicopter turns through N onto 035° - the Robin still indicating 1000ft Mode C - whereupon the contacts merged at 0928:32; radar contact on the Gazelle is then lost and does not show again until 37 sec later. Consequently the helicopter pilot's avoiding action R turn is not shown. The avoiding action climbing L turn reported by the HR200 pilot is not reflected by the radar recording and the Robin indicates 1000ft Mode C throughout.

UKAB Note (2): The Robin pilot reported that the other helicopter was "*larger than a Gazelle*" and may have been a Lynx, but both the Gazelle and Robin pilots' descriptions of the geometry broadly agree. As the Lynx was some 3-400ft above the Robin and descending, it is believed that the Robin pilot actually saw the Gazelle flown by the reporting pilot - not the Lynx, which had already crossed ahead and above his ac.

ATSI had nothing to add.

HQ JHC comments that both pilots' difficulty in visually acquiring each other was undoubtedly compounded by the ac colour schemes, one being a camouflaged helicopter against a green, rural background and the other a light fixed wing ac with a grey underside against an overcast sky. This Airprox highlights the requirement for lookout throughout all stages of flight.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available to the UKAB included reports from the pilots of both ac, radar video

recordings, and a report from the appropriate operating authority.

The members agreed that from the geometry reported by the HR200 pilot, the profile flown by the Gazelle most closely matched his description of the occurrence, unlike the Lynx helicopter which had been 3-400 ft above both the HR200 and the Gazelle throughout. The comprehensive report from the HR200 pilot had highlighted the problems of ac conspicuity here against similar backgrounds. Whilst the turns reported by the HR200 pilot were not evident on the radar recording, helicopter pilot members concurred with the JHC comment that the grey underside of the Robin against the grey overcast would have made it very difficult to see. Furthermore, a civilian helicopter member confirmed the effectiveness of the standard Gazelle grey/green camouflage scheme against the countryside below, explaining that this small helicopter was extremely difficult to spot from above. Understandably this, coupled with little relative movement between the two ac as the Robin approached the Gazelle from abaft the port beam and the distraction of the Lynx helicopter to the NE had all conspired to mask the presence of each other's ac from the other pilot. Consequently, this led to a late sighting by both pilots, which the Board agreed unanimously, was the cause of this Airprox.

Turning to risk, both pilots agreed broadly on the vertical separation that pertained – 30-50ft, but as Mode C is not fitted to the Gazelle helicopter the vertical separation could not be determined with certainty. However, the Board noted that the Gazelle pilot's estimate as the Robin passed by was 150m, whereas the Robin pilot reported 2-300m. The radar recording showed that both contacts had merged, thereby confirming it had been a close call. In the Board's opinion the sighting, albeit late, and subsequent avoiding action by both pilots had removed the actual risk of a collision. Nevertheless, the close proximity and little time available for the pilots to accomplish their avoidance manoeuvres convinced the members that the safety of the subject ac had been compromised.

AIRPROX REPORT No 110/02.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Late sighting by both pilots.BB

Degree of Risk: B.

AIRPROX REPORT NO 110/02

Date/Time: 3 Jul 1726

Position: 5140N 0034E (16nm E LAM)

Airspace: TMA (Class: A)

Reporting Aircraft Reported Aircraft

Type: MD82 B737-500

Operator: CAT CAT

Alt/FL: FL170 ↓FL170

Weather VMC SKC IMC NK

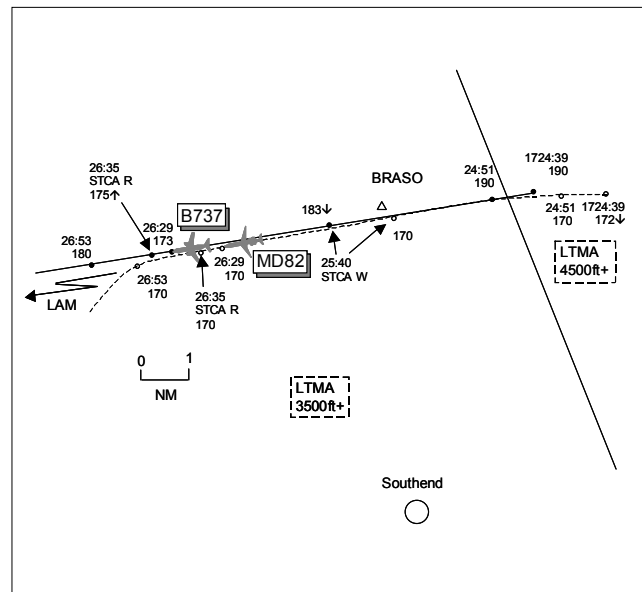
Visibility: UNL NK

Reported Separation:

200ft V 1.5-2nm H 300ft V 1nm H

Recorded Separation:

300ft V 1.2nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE MD82 PILOT reports heading 266° at 250kt enroute to Heathrow following a LAM 3A STAR. Approaching LAM at FL170 flying into sun in VMC with unlimited visibility, he saw an ac in his 12 o'clock descending towards his level from above, heading in the same direction. This was confirmed by his TCAS indications. He asked ATC for TI and he was given a L turn onto heading 180°; simultaneously TCAS gave a TA alert. The other ac was seen to descend to within 200ft above his level and about 1.5-2NM ahead.

THE B737 PILOT reports heading 270° at 225kt inbound to Heathrow and in receipt of an ATC service from LONDON on 121.22MHz. Approaching about 12nm E of LAM and while descending from FL190 to FL170, he received an ATC climb instruction to FL180. He reached FL173 before commencing a climb whilst simultaneously TCAS gave a TA alert on traffic 300ft below and 1nm behind.

ATSI reports that the LAM SC reported that workload had been high throughout the shift and, although traffic loading was only moderate, the situation had been complicated by ac avoiding weather and holding both standard and non-standard at LAM i.e. to the L and R. This situation was described by the SC, in his written report, as 'disorientating', although he had experienced it on a number of previous occasions. Ac were holding both at BRASO and LAM but the controller stated that this was not unusual for the time of day.

The controller took over the LAM Sector at 1722, i.e. about four min before the Airprox occurred. He stated that the handover had been adequate and does not attribute the incident to the brief period he had been at the position. At this time, the MD82 was already on frequency, having been cleared from the BRASO to the LAM hold, at FL180. After taking over the position, the controller issued several descent clearances to ac inbound to LAM, including to a flight ahead of the

MD82. Accordingly, he was able to clear the MD82 to descend to FL170, as that level was vacated.

The B737 established communication with the LAM Sector, at 1724, reporting in a L turn direct to LAM at FL190. The call was acknowledged and an update to its EAT (1743) was passed. Radar recordings of the event show that the B737's turn resulted in it turning inside the track of the MD82 and positioning it just ahead of this ac, as they both tracked towards LAM. Revised EATs, including one to the MD82 (1742), were then transmitted to other ac inbound to hold at LAM. Having completed this task, the LAM SC instructed the B737 to descend to FL170, the same level as the MD82. The radar at 1724:51 shows the B737 (still maintaining FL190) 1.6nm ahead of the MD82, with both ac tracking towards LAM, at apparently similar speeds. The SC said that he believed that his error, in clearing the B737 to an occupied level, arose because the B737 was now ahead of the MD82. He explained that he had scanned the airspace ahead of the B737 and, not observing any conflicting traffic, believed it was next in the sequence. Consequently, he had cleared it to descend to FL170. Although he had previously cleared the MD82 to the same level he had overlooked this ac's presence on his radar display, probably, he thought, because of its position relative to the B737. He added that there may also have been a degree of label overlap, between the subject ac, at the time. He admitted that the fps display would have shown the situation but although he annotated the B737's fps with its cleared level of FL170, he did not register that this was the same level as the MD82.

In common with other ac on the frequency, the MD82 requested to hold R hand at LAM. Whilst this request was being made by the pilot and approved by the SC, STCA activated with a low severity alert, as the B737 was passing FL183. The SC inexplicably believed that he had only cleared the ac to descend to FL180 and assumed, therefore, that the STCA alert was only a 'nuisance' warning. However, he continued to monitor the B737's descent profile and realised that it had dropped just below, what he considered to be, its cleared level. Following a lengthy transmission from another ac on the frequency, the SC instructed the B737, at 1726:10, to "*climb maintain flight level one eight zero*". It is evident that the pilot was confused by this instruction and

it had to be repeated by the SC. The SC said that, at the time, he still believed that the ac had made a slight dip below its cleared level and reasoned that the action taken would soon restore separation, without the need to use the term 'avoiding action'. However, the pilot was unable to arrest the ac's RoD before it reached FL173, at which time it was 1.2nm ahead of the MD82. (The STCA changed to a high severity alert as the B737 climbed through FL175.) The pilot of the MD82 commented that he had an ac "*straight ahead er same level er one mile*". The SC immediately issued the MD82 with an 'avoiding action' turn heading 180°. In response, the pilot reported that he could see that the other traffic was now climbing. Vertical separation was quickly restored, by 1726:53. Thereafter, both ac continued to LAM, initially at FL170/180 respectively.

Both pilots involved in the incident reported receiving a TCAS TA. The pilot of the MD82, in his written report, stated it was as ATC instructed him to turn onto 180° and the B737 pilot commented, on the LAM Sector frequency that "*I didn't have him on the TCAS until the very last second*".

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 LAM SC was undoubtedly busy - the EATs being passed indicated nearly 20 min delays - and he had just taken over the Sector shortly before the incident. ATCOs were familiar with the scenario and its associated pitfalls. Having seen the B737 on radar as being the ac nearest to the holding stack LAM, the SC had assumed it to be the next one in the 'stepping down' sequence (for the lowest available level) overlooking the presence of the MD82 that he had cleared shortly beforehand to the same level. This may have been a temporary oversight or lapse in concentration but he had then correctly annotated the B737's fps without registering the potential conflict from the fps display. However, a safety net in the form of STCA activated; this should

AIRPROX REPORT No 111/02.

have prompted the SC to check for conflicts, both on radar and additionally by checking the fpps but he dismissed it as a nuisance alert. Accordingly members were clear that despite clues and a warning, the LAM SC had descended the B737 to the same level as the MD82, to cause the encounter.

The SC, on seeing the B737 descending through its cleared level, had been unable to use the RT immediately but subsequently was able to instruct its crew to "climb to maintain flight level one eight zero". This had apparently confused the B737 pilot which necessitated a repeat of the instruction, further delaying the required remedial action. It was a pity the SC had not used the 'avoiding action' phraseology, which undoubtedly had not conveyed the urgency of the situation to the B737 crew who descended to FL173 before climbing, whilst simultaneously receiving a TA alert on the MD82 behind and below them.

Happily the MD82 crew were in a position to watch the whole incident develop. They saw the B737 ahead visually and on TCAS, observing it descend towards their level - there was hardly any overtake and the situation unfurled ahead of them in 'slow time'. After posing the obvious question to ATC, the MD82 crew were given an avoiding action L turn away simultaneously as TCAS also gave them a TA alert. Although an untidy situation at best, these elements combined persuaded the Board that any risk of collision had been effectively removed.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The LAM SC descended the B737 to the same level as the MD82.

Degree of Risk: C

AIRPROX REPORT NO 111/02

Date/Time: 6 Jul 1814 (Saturday)

Position: 5713N 00407W
(20nm S of Inverness)

Airspace: ADR/FIR (Class: F/G)

Reporter: ScACC

First Aircraft Second Aircraft

Type: BA46 P3C

Operator: CAT Foreign Mil

Alt/FL: FL80↑ FL90

Weather VMC CLBL VMC CLAC

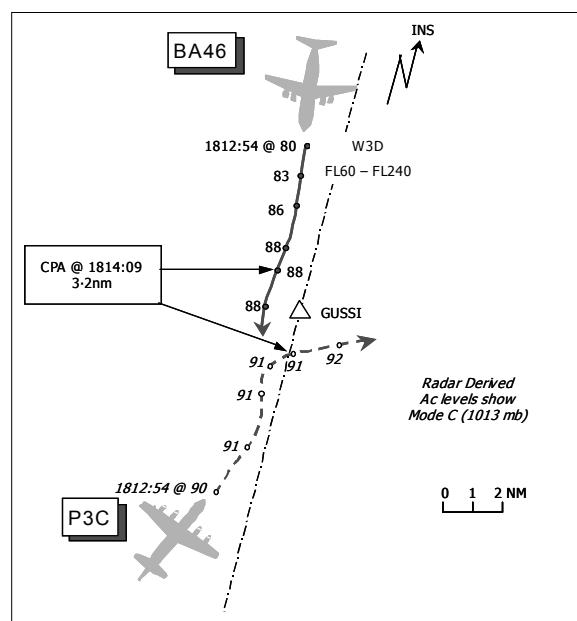
Visibility: NK >10km

Reported Separation:

Nil V, 3nm H 200ft V, 1nm H

Recorded Separation:

300ft V, 3.2nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE ScACC TAY SECTOR CONTROLLER reports that he had issued a procedural, departure clearance to Inverness for the BA46 on ADR W3D climbing to FL250 and an active flight progress

strip was subsequently produced and displayed. At approximately 1815, with the ac still under the control of Inverness ATC, he became aware of traffic on a ScATCC(Mil) squawk at FL90 on an

easterly track about 5nm ahead of the BA46, which had now appeared on his radar. He immediately rang ScATCC(Mil) Allocator to alert him of the potential confliction. The BA46 then called on frequency and, since separation now appeared to be less than 5nm if tracks were maintained, he gave the pilot avoiding action and traffic information. At the same time the ScATCC(Mil) traffic turned towards the BA46 and consequently he advised the BA46 pilot to stop his climb immediately, which he did at FL88; further traffic information was passed. Visual contact was reported as the other traffic turned away again to the E.

THE BA46 (RJ1) PILOT reports that he had just departed Inverness for Zurich and was climbing at 210kt between cloud layers on a heading of 190°, he thought, when ATC advised him to stop climb and turn right 30°, he thought. At the same time he received a TCAS TA on the other ac and, because he was by now in VMC, he visually acquired what he thought was a Nimrod in a R turn about 3nm away at the same altitude just before it disappeared into cloud. He did not consider the event dangerous.

THE P3C PILOT reports that he was in transit back to Kinloss at FL90, about 500ft above cloud, heading E at 260kt and in receipt of a RAS from ScATCC(Mil). ScATCC(Mil) then advised traffic and gave a L turn onto N, he thought, shortly followed by a R turn onto S. During the R turn the other ac was spotted approx 1 – 2nm away and 500ft below but climbing. The revised vector kept him clear of the other ac by about 1nm and thereafter he was able to resume track to Kinloss.

The P3C pilot adds that his ac was coloured grey and that all nav lights and HISLs were selected on. However, his ac was not fitted with TCAS.

THE ScOACC ENGINEERING WATCH MANAGER reports that an investigation of radar services provided to ATC revealed that coverage in the area of the reported incident showed discrepancies between the radars being used. Three radar displayed the P3C and not the BA46 whereas the Aberdeen (Perwinnes) radar displayed the BA46 and not the P3C. Both ac were displayed on Allanshill radar.

ATSI reports that the incident took place approximately 20nm S of Inverness Airport in

Class F airspace. The BA46 was outbound from Inverness to Zurich, operating on an IFR flight plan and routing initially via ADR W3D. At 1802, the ScACC TAY sector controller (SC) issued Inverness ATC (who are not radar equipped) an outbound procedural clearance for the BA46 to climb to FL250. ScACC is the notified controlling authority for ADRs in the vicinity of Inverness but from Monday to Friday, during specific times, Lossiemouth Radar provides a RAS to Inverness IFR outbound traffic up to FL100, prior to transfer to the appropriate ScACC sector. On this occasion, however, being the weekend, the TAY SC could expect the BA46 to be transferred direct to his frequency on transfer from Inverness ATC. The BA46 departed at 1808 and a little under 3 min later was shown passing FL61 on the Tay SC's display, which had been set, as it is routinely, to the Aberdeen (Perwinnes) radar source. [Note: The Allanshill radar displayed both ac prior to them being shown on the Aberdeen (Perwinnes) source. ScACC advises that the TAY sector customarily uses Aberdeen and either Lowther Hill or Great Dunfell to provide coverage over the full lateral extent of the sector's area of responsibility and the Allanshill is (generally) of limited use to civil (and military controllers, it is believed) because primary cover extends only to 60nm – beyond this range it is SSR only. Following this incident, ScACC has implemented measures to raise controller awareness of the capability of the Allanshill radar in specific circumstances.] The SC reports that before the BA46 established communications with him he noticed other traffic transponding SSR code 4601 (without callsign conversion) at *"FL90 on an easterly track and crossing ahead of the BA46"*. The radar recording indicates that at this point the BA46 was climbing through FL80 on a southerly track, with the "4601" traffic level at FL91, Mode C, in its 12:30 position at a range of approximately 13nm. The latter was tracking NE and crossing the ADR at about 45° to its centreline. Recognising "4601" as a ScATCC (Mil) code, the SC immediately selected the ScATCC(Mil) Allocator telephone line *"...to alert him to the potential conflict"*. The telephone was answered by the military assistant who identified himself as *"D & D Support Scottish Mil"*. [Note: It is understood that the ScATCC(Mil) and D&D tasks were being operated from the D&D suite at the time]. Without further enquiry the TAY SC said *"...watch my [company c/s] there's a [company c/s] climbing out of er Inverness against your 4601"*.

AIRPROX REPORT No 111/02.

The assistant acknowledged this information with "Roger" to which the SC responded "Right across his nose watch it". Again the response was "Roger" and the call was terminated. The ScACC MATS Pt 2 Gen 5-8 para 4.11 (b) states that "Outside CAS, below FL245, military and civil controllers are equally responsible for initiating co-ordination" (between GAT (BA46) that conflicts with OAT/DAT). Also, in para 4.12 it states that co-ordination is to be initiated by prefixing the message with the term "**Request Co-ordination**" - when *confliction between a specific number of aircraft can be identified and resolved through co-ordination*". It adds "Controllers who initiate co-ordination are responsible for securing mutual agreement on the course(s) of action to be taken" and "Controllers are not to regard the act of co-ordination as being complete until a positive statement of the action(s) has been given or received". Clearly, on this occasion the SC did not follow this procedure. Employing the opening phrase "Request Co-ordination" would have informed the ScATCC(Mil) assistant that the caller wished to speak with a controller. Thereafter, a co-ordinated resolution to the conflict could, theoretically, have been achieved. That said, one would have hoped that, in view of the urgent nature of the message from the TAY SC, the relevant Military controller would have been alerted to its contents as soon as possible.

About 15 sec later the BA46 made its first call on the TAY sector frequency on transfer from Inverness. The pilot reported passing FL84 for FL250 and routing direct to the GOW VOR (Glasgow). The SC assessed that if the 2 flights continued on their current tracks, it was unlikely that the minimum 5nm horizontal separation would be achieved (the minimum that he would be seeking to achieve under a RAS (MATS Part 1 Sect 1 Chap 5 1.4, RAS, refers). Consequently, at 1813:25, the SC's response was "...*(callsign) er avoiding er action...(callsign) turn R immediately heading 240 there's er traffic at FL90 12 o'clock at a range of 8 miles...*". He also advised the pilot to stop the climb immediately as it became apparent, the SC explained in his written report, that the other traffic had turned towards the BA46. The pilot read back the instruction correctly, adding that he was "looking out". The radar recording shows that the 4601 traffic had commenced a L turn towards the N and was briefly head-on to the BA46 prior to it turning R onto an easterly track.

The SC then advised the BA46 pilot that the traffic had now turned "to the R" (towards the E) and sought confirmation that the climb had been stopped. He added that the traffic was still at 12 o'clock, but was now disappearing from his radar cover. This occurred probably when the 2 ac were about 4nm apart. The pilot reported the traffic in sight and moments later asked "...*can we proceed with a visual separation (to the) Glasgow VOR we have the traffic in sight er its no factor any more*". This was approved and the flight released on its own navigation to the GOW. Information from the various sources of recorded radar data indicate that when the 4601 traffic was briefly head-on to the BA46, at a little under 4nm range, their mode C readouts showed FL91 and FL88 respectively. The 4601 traffic then turned E and the ScACC unit report states they reached their closest point when 4601 traffic was to the SE of BA46 at just under 3nm and there was 400ft of vertical separation – the former indicating at FL92 and the latter at FL88. It is not known what service the 4601 traffic was under at the time.

The ScATCC(Mil) authorities have issued an instruction to staff that, in essence, states when working traffic which will pass to the S of Inverness, at or below FL130 and within 30nm of the Airport they are, Mon - Fri, to co-ordinate with Lossiemouth ATC for potential Inverness departures and at the weekend carry out the same exercise with the ScACC TAY sector. The instruction adds that the relevant co-ordination should be agreed and implemented before their traffic has reached within 10nm of the centreline of W3D. ScACC civil authorities are reviewing their procedures.

MIL ATC OPS reports that the ScATCC(Mil) rostered controller was on a break from the Operations Room and controlling duties had been transferred to the D&D Controller. In accordance with ScATCC(Mil) Controllers' Order Book Sect 1 Order No 32, single controller manning of ScATCC(Mil) is authorised subject to:

"3. Breaks Away From Operations Room. During single controller manning in the Main Operations Room the Controller may take short breaks away from the Operations Room provided that the following conditions are met:

a. Traffic Under Service.

(1) Control is handed to the D&D Controller who will continue to provide the service within the normal priorities of service laid down in HQ STC ATC Orders Sect 2, Chap 3 Para 0313.

(2) Ch 31E, 31W and 10 are cross coupled and at least one of these frequencies is selected and monitored by a controller in D&D.

(3) The Supervisor's telephone extension 6020 is to be patched to the D&D telephone extension 6610 (Annex A provides a guide for patching and unpatching phones).

(4) Any break is to be as short as possible and in no case longer than 20 minutes.

(5) The location of the Ops Controller is to be left with the D&D Controller and apart from short natural breaks a contact extension is to be provided".

b. No Traffic Under Service.

(1) *As per para 3a (2) to (5) inclusive.*"

The P3C, level at FL90, called ScATCC(Mil) at 1805:11 and requested a RAS inbound to Kinloss. The ac was identified by the D&D Controller and provided with a RAS. At 1808:00 the D&D Controller advised the P3C pilot "... *limited warning of traffic from below at the base of radar cover*". Radar handover to Lossiemouth Approach (APP) was commenced at 1812:22 during the course of which, at 1812:53, APP advised the D&D Controller of "*traffic L 11 o'clock range of 10 miles climbing out of Inverness*". The D&D controller replied "*I don't see that one*" and so, at 1813:00, APP suggested "*OK, avoiding action, turn L please heading 330*". This was immediately relayed to the P3C by the D&D Controller together with traffic information, based on the information passed by Lossiemouth APP, "*...unknown traffic, eh NE of you range of 10 miles, not seen on my radar*". Shortly afterwards the BA46 became evident on displayed radar and so, at 1813:17, the D&D Controller endeavoured to stop the original avoiding action "*C/s, eh maintain your present heading now, traffic is N of you range 5 miles passing FL85*". Subsequently, at 1813:32, the D&D Controller attempted to issue further avoiding action; however, this transmission was blocked by another, simultaneous transmission. The D&D Controller immediately

made a further attempt but again the transmission was blocked by radio interference. At 1813:38 the P3C pilot asked, "*Are you calling...!*" to which the D&D Controller responded with "*C/s, avoiding action turn R heading 090*". Once the P3C pilot had confirmed turning, the D&D Controller passed traffic information on the BA46 which by now was "*... N range 5 miles passing FL87 climbing*". The D&D Controller then called the TAY SC but no sooner had the latter answered when the P3C pilot reported visual contact with the BA46 followed, at 1814:20, by the P3C pilot reporting "*well clear of the traffic*". Subsequently the handover to Lossiemouth APP was completed at 1815:00.

It became evident to the D&D Controller, as the BA46 came into radar cover, that the avoiding action given to the P3C pilot was inadequate and that further action was required. The D&D Controller elected to reverse the turn onto E, a decision made, it would appear, after he had first cancelled the original avoiding turn L onto 330° leaving the P3C hdg towards the BA46. The Unit reports that it was a fine line as to whether reversing the turn of the P3C would improve the situation. With the benefit of hindsight and the radar replay, a further turn to the W may have been more prudent.

Unlike control suites in Operations Room, the D&D control suite has only one radar display and therefore D&D controllers cannot monitor 2 radar sources simultaneously. On this occasion the D&D controller had been switching between Tiree and Aberdeen (Perwinnes) radars to determine when the P3C would show on the latter and in order to pick up traffic not showing on the Tiree. The Unit is aware of the limitations posed by radar cover to the S of Inverness and the danger of Inverness departures on W3D climbing rapidly into cover. But, following assumption of responsibility by Lossiemouth ATC of the Inverness Approach task, former internal procedures, whereby ScATCC(Mil) controllers sought information from Inverness on impending departures, were superseded. Consequently the D&D controller assumed that Lossiemouth would be controlling any traffic departing Inverness, an assumption supported by existing local orders, and that an early radar handover of the P3C to Lossiemouth APP would resolve any problems. However, this was not the case and it was only as a result of this incident that it was discovered that

AIRPROX REPORT No 111/02.

Lossiemouth ATC has no responsibility for Inverness departures at weekends. Accordingly ScATCC(Mil) local orders have now been revised. Additionally, subsequent investigation showed that both ac were displayed on the Allanshill radar. This source, which has SSR cover out to 120nm, only displays primary radar contacts to a range of 60nm and was, therefore, not an obvious choice for use by the D&D Controller. Rather, the Tيرة radar is still considered to be the optimum selection in the area of the incident for both primary and secondary radar cover. However, as a result of this incident use of the Allanshill radar has been reviewed and ScATCC (Mil) controllers have now been issued with revised guidelines accordingly. Furthermore, the Unit also reports that a safety survey will be conducted on single controller operations.

The Lossiemouth APP Controller reports that he had seen the BA46 climbing out from Inverness along W3D. Consequently, when the ScATCC(Mil) D&D Controller rang for handover on the P3C, his initial thought was that the P3C may have been co-ordinated as the BA46 appeared to stop at FL80. But as the handover progressed he noted the BA46 passing FL82, pointed out the confliction to the D&D Controller and suggested avoiding action since the D&D Controller was unable to see the traffic. With the benefit of hindsight, the suggested heading of 330° was inappropriate for increasing separation between the ac. Had the initial avoiding action turn suggested by Lossiemouth APP been to the E, undoubtedly separation would have been greater.

This incident has highlighted some areas where procedures needed improvement. In most cases action has already been taken to address these issues.

UKAB Note (1): Analysis of the Allanshill radar data recording reveals that at 1812:54, the P3C, squawking 4601 with Mode C displaying FL90, is 7nm SSW of GUSSE and tracking 020°. At the same time the BA46, shown with code/callsign conversion and Mode C, is 6nm N of GUSSE tracking 190° and passing FL80 in the climb. At 1813:28, the P3C, displaying FL91 on Mode C, turns onto a N hdg with the BA46, by now at 1230 range 8.8nm. Two sweeps later the P3C, still displaying FL91 on Mode C, begins a turn onto E whilst the BA46, at FL87 on Mode C, makes a

slight R turn. Thereafter, the BA46 maintains FL88. CPA occurs at 1814:09 when the subject ac are 3.2nm apart with 300ft V separation. STCA activates at 1814:16.

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 data recording photographs, radar data video recording, reports from the air traffic controllers involved and reports from appropriate ATC authorities.

Much discussion focused upon the fact that the 3 controllers involved in this incident had each used different radar sources, resulting in differing degrees of information being revealed to them on the 2 ac. Of the 3 controllers, only Lossiemouth APP retained radar contact with both ac throughout the encounter. For his part the TAY SC, aware of the impending problem, had endeavoured to anticipate it, but lost contact with the P3C when it turned E. The D&D Controller, however, had the least complete picture since he was unaware of the presence of the BA46 until so alerted by Lossiemouth APP; worse, only after committing the P3C pilot to the L turn was he able to see the developing situation for himself. Members noted, notwithstanding the limitation of SSR data only, the Allanshill radar had displayed both ac throughout and though available to both the TAY SC and the D&D Controller, it had remained unselected. Board members further noted, and welcomed, measures taken by ScACC and ScATCC(Mil) management to raise controller awareness of this radar source, especially in light of the known deficiency of radar coverage to the S of Inverness.

Some members queried the appropriateness of the service initially given to Inverness departures before a RAS could be provided by TAY SCs. Whilst it was appreciated that the provision of service to Inverness IFR arrivals and departures via ADR W3D is vested with Lossiemouth ATC from Mon to Fri only, presumably for reasons of funding, outwith these times - ie weekends and public holidays - such GAT would appear to be less well served. Moreover, as this incident revealed, there were no procedures in place to afford any degree of protection for GAT against

OAT within an area known to have poor radar coverage. UKAB would welcome their belated provision.

Board members also discussed, at some length, provision of service by the D&D Controller in the absence of the rostered ScATCC(Mil) duty controller from the Ops Room. It was accepted that the D&D Controller could still respond to the declaration of an emergency by another ac in the ScATCC FIR/UIR whilst working en route traffic. Nevertheless it was recognised that the D&D controller was constrained to displaying a single radar source unlike the duty controller in the Ops Room, who normally operates from the Allocator's suite, who could display 4 different sources simultaneously. This put the D&D Controller at a considerable disadvantage, as evinced by this incident, when working one track only. Therefore, noting that a safety survey is to be conducted on ScATCC(Mil) single controller manning, UKAB members invited the Mil ATC Ops adviser to brief them on its outcome.

Turning to the sequence of the incident itself, the TAY SC had recognised the impending encounter and had endeavoured to alert the controller of the ScATCC(Mil) traffic. Because the landline had been diverted to the D&D controller and the latter had already commenced radar handover of the P3C to Lossiemouth APP, the call was answered by the D&D Controller's Assistant, who identified himself as "D&D Support Scottish Mil". It was suggested by civil ATC members that this could have been misconstrued by the TAY SC as a controller since "Support Controller" has civil ATC connotations and the role description "assistant" was not used. Furthermore, contrary to the ATSI report, a civil ATC member pointed out that the TAY SC was not in a position to effect traffic co-ordination since, at the time of the call, he did not have contact with the BA46. Consequently, the call, albeit abrupt, was merely traffic information. Nevertheless, this proved to be somewhat academic since by then Lossiemouth APP had

given the D&D Controller the hdg of 330°. As events showed subsequently this was not the optimum avoiding action, which the D&D controller attempted to nullify when he instructed the P3C pilot to stop the turn. This compounded the situation. Thereafter immediate resolution was frustrated twice by radio transmission interference received by the D&D Controller. This run of events, involving advice from Lossiemouth APP, the D&D Controller and limited information being displayed had caused the Airprox. But eventually, the situation was resolved by the R turn onto E, a turn, most Board members thought, the D&D Controller would probably have given had he been able to see the BA46 on radar.

Some Board members believed the BA46 crew, though given an avoiding action R turn hdg 240°, were slow to react and then only partially before visually acquiring the P3C. This possibly further compounded the situation. Airline pilot members suggested that not taking the turn immediately and in full was ill advised, especially given the speed and energy of the BA46 together with the nature of the instruction as the BA46 pilot made initial contact with the TAY SC. In this case, it was suggested, the crew should have turned and then looked rather than vice versa; to look and then turn, it was suggested, was more appropriate for pilots of lower performance ac. Nevertheless, the BA46 crew did see the P3C, as it turned away, and separation did not reduce below 3.2nm and 300ft. Therefore, it was clear that there was no risk of collision.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: ScATCC(Mil) D&D Controller, on the advice of Lossiemouth APP Controller, vectored the P3C into conflict with the BA46, which was not visible on his radar display.

Degree of Risk: C

AIRPROX REPORT No 112/02.

AIRPROX REPORT NO 112/02

Date/Time: 12 Jul 1741

Position: 5051N 00241E (10nm W of KOKSY)

Airspace: AWY G1 (Class: A)

Reporter: LACC S15/16/17 Control Team

First Aircraft Second Aircraft

Type: B737 B747

Operator: CAT CAT

Alt/FL: FL220↑ FL200↑

Weather VMC CLAC IMC KLWD

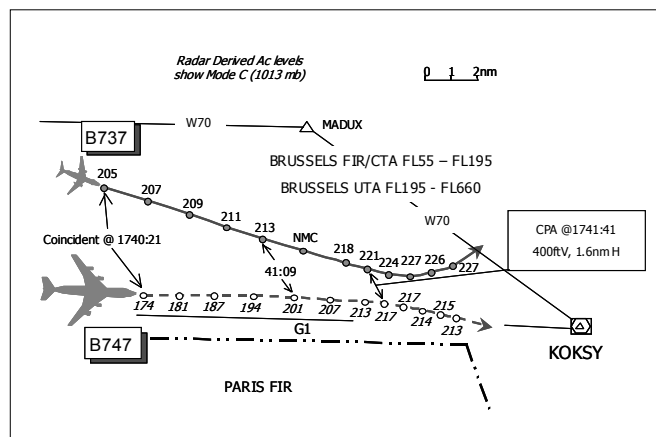
Visibility: >10km NK

Reported Separation:

400ft V 400ft V, 1nm H

Reported Separation:

400ft V, 1.6nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE LACC SECTOR 15/16/17 TACTICAL CONTROLLER (S15/16/17 TAC) reports that the B747 was climbing after departure from Manston. The B737 was at FL120 in the Dover area still working LTCC. He asked the Planner to ask TC to transfer the B737 to him as it was low. When the B737 was transferred it was climbed to FL290. The B747 was 'step' climbed under the B737 to FL110, then FL140 then FL170. The bandboxed sector was busy and the Planner announced "*It's all been done with Brussels*". This was taken to mean both the B747, as the ACT [UKAB Note: Active Strip] had not gone, and the slow climbing B737. The MATS Pt 2 allows for slow climbing traffic into Maastricht airspace to cross KONAN FL215 or above. The B737 was below this by approximately 2000ft. The B747 was transferred to Brussels. Later the STCA flashed and the B747 was climbing –to a level, he thought, that would be 1000ft below the B737. He continued with other traffic in the bandboxed sector and on returning to the B737 he noticed that the B747 was still climbing to a point where 1000ft vertical separation was being eroded. He immediately gave avoiding action, initially "*L heading 360°*". The B737 pilot reported traffic in sight. When the B737 was passing FL245 it was transferred to Maastricht on its own navigation and advised that reporting action was being taken. He also adds

that at some stage during the incident he asked the B737 to increase ROC. Moreover, at no time was any TCAS report made by the B737 pilot.

THE LACC SECTOR 15/16/17 PLANNER (S15/16/17 PLN) reports that the B737 was transferred late from LTCC SE Sector and subsequently climbed by the S15/16/17 TAC. The B747 departed Manston, joining at DOVER and routing to KOKSY. He set a transfer FL of FL170 for this flight and, because the OLDI [UKAB Note: On-line Data Interchange] does not go until after ac are transferred, he instructed the Sector Assistant to co-ordinate manually [UKAB Note: Obtain approval] with Brussels "climbing to FL170". This was carried out and he informed TAC that the B747 had been co-ordinated. He then continued with other electronic co-ordination. At 1741 TAC observed STCA highlighting the subject ac. He immediately rang Brussels to request that the B747 be stopped off at FL220 and advise that the B737 was still being climbed. The B737 was not co-ordinated with Brussels. Ac on this route/profile are climbed into Maastricht airspace and required to be FL215+ by KONAN and FL245+ by 10nm W of KOKSY, unless such co-ordination is carried out with Brussels ACC. Co-ordination with Brussels is usually carried out by the TAC, but PLN will effect co-ordination either

if requested by TAC or PLN anticipates the requirement by monitoring the radar.

THE BRUSSELS ACC SECTOR 1 CONTROLLER reports that the B747 was cleared to FL230. Unknown traffic on SSR code 5225 appeared 2nm to the NW of the B747 and climbed above the B747. The other ac was subsequently identified as a B737 on London frequency. Traffic information was given to the B747 and it was recleared to FL220.

THE B737 PILOT reports that he was en route Geneva from London Stansted and with London ATC, having been cleared to FL290. Passing FL200, whilst heading towards KOKSY at 300kt, he received a TCAS RA to climb at about 2200fpm. Immediately after the RA ATC instructed a L turn heading 060° and then further L heading 360°. The FO observed a B747 at 2 o'clock low and closing. The ATC instruction alone would not have reduced proximity to the other ac but after compliance with the TCAS RA, he assessed that there was no risk of collision. He states that minimum vertical separation from the other ac was 400ft.

THE B747 PILOT reports that he was en route from London Manston to Luxembourg and in contact with Brussels ACC on 131.1 MHz. When 10nm W of KOKSY, heading 120°, he thought, at 300 kt and passing FL200 for FL230, he was advised by ATC of unidentified traffic from L to R. He also received a TCAS RA to adjust vertical speed from the red sector (2000fpm) to the green sector (0 – 500fpm) ROC. During compliance with the RA, ATC instructed him to level off at FL220 followed by an instruction to turn R 20°. As he became VMC he saw the other ac, a B737, 1.5nm in his 8 o'clock turning away to the L. He estimates that minimum separation was 1nm H and 400ft V, and assesses that the risk of collision was high. He adds that his ac was white and that HISLs, nav lights and inboard landing lights were all selected on.

ATSI reports that this incident occurred approximately 10nm W of KOKSY, in Brussels Class A airspace. The B747 had been transferred to Brussels ACC but the B737 remained under control of LACC Dover Sector (Sectors 15 & 16). The 'Dover/Lydd' Sectors (S15, 16 & 17) had recently been bandboxed and were being operated by TAC and PLN Controllers. The

former assessed the workload as being on the "higher side of medium", the latter as "moderate to high". Traffic loading was no more than "medium" but there were some "complicated" situations to resolve.

The B737, out of Stansted, was expected to be transferred from TC to the Dover Sector climbing to FL170 iaw the applicable Standing Agreement. The B747 was to depart from Manston, which is outside controlled airspace. IAW what it is understood to have become almost standard practice, the flight was issued with a clearance, via Manston ATC, to join controlled airspace on track for DOVER, climbing to FL70. ATS to the E of the Dover Sector boundary is provided by Brussels ACC up to FL245 and by Maastricht ACC above FL245. Thus the B747, with a requested level of FL230, would be transferred to Brussels ACC and the B737, requesting FL330, would be transferred to Maastricht ACC. IAW published procedures, the B737 was initially allocated an exit level of FL290 and this was passed to Maastricht ACC automatically by means of the OLDI link. Because of the proximity of Manston to the FIR boundary, it is a requirement that departures are subject to an Approval Request with Brussels ACC. The ATSA carried out this task and it was agreed that Brussels ACC would accept the B747 climbing to FL170. However, this co-ordination was not annotated on the relevant paper FPS; the ATSA merely marked 'BR'. It was noted that this was done in green ink, which should be used only by the PLN. ATSAs should only mark the FPS using black or blue coloured ink. Nevertheless, TAC was made aware of what had been agreed and knew that the task was to clear the subject ac to FL170 and FL290 respectively.

The crew of the B747 established contact with S15 TAC at 1734:00 and reported passing FL56 for FL70 inbound DOVER. TAC instructed the crew to squawk "ident", issued further climb clearance to FL110 and cleared it direct to KOKSY. A short time later TAC confirmed that it was identified and under a radar control service. In the meantime, it had been noted that the B737 was later than normal being transferred from TC; it was observed in the DOVER area level at FL120. TAC asked PLN to telephone TC and remind them to transfer the ac. TAC had recognised from the outset that a potential conflict existed between the subject ac and his plan was

AIRPROX REPORT No 112/02.

to 'step climb' the B747 under the B737 and, accordingly, climbed the B747 initially to FL110.

The crew of B737 made their initial call on the S15 frequency at 1735:30 and reported climbing to FL170, the appropriate 'Agreed Level', on radar hdg 100°. TAC cleared the ac to FL290. The ac had been transferred late; it had only just left FL120 and did not have a high ROC. It was quickly recognised that it would cross the FIR boundary at a Brussels ACC level, ie below FL245. There is an agreement, between LACC and Brussels ACC, whereby 'slow climbing' flights, such as B737, are not required to be co-ordinated with Brussels, provided they cross KONAN at FL215 or above and 10nm west of KOKSY at FL245 or above. TAC could see that it was unlikely this profile would be achieved and was aware that co-ordination would be required with Brussels ACC. LACC MATS Pt 2 DVR-16 states: *"Any aircraft unable to achieve this climb performance is to be co-ordinated with Brussels ACC by the S16 Tactical."*

Central to this Airprox is a brief discussion, which took place between TAC and PLN, relating to the subject ac. TAC gained the impression that both ac had been co-ordinated with Brussels ACC. His recollection was that PLN had said words to the effect that *"... it's all done with Brussels."* PLN was adamant that he had only said words to the effect that *"(B747 c/s) has been co-ordinated with Brussels climbing to FL170."* At interview, he said that he would have made specific reference to the B737 if he had co-ordinated that flight. The interviewees were both aware that it would have been TAC's responsibility to co-ordinate the B737 with Brussels ACC; however, they conceded that in practice it is usually PLNs who carry out this task, either on their own initiative or at the request of TAC. Whatever the case, such co-ordinations should be recorded on the TAC's FPS. This was not done in this instance and, according to TAC, this action is omitted more often than not. It is considered that the likelihood of erroneous assumptions being made would be considerably reduced if controllers routinely worked on the basis that, if such co-ordinations have been carried out, the relevant FPS would be annotated accordingly. LACC MATS Pt 2 GEN-19 (et seq) requires co-ordinations of this nature to be recorded on the appropriate FPS. Following previous events of a similar nature, the SRG ATS Standards Department issued Air Traffic Services

Operational Memorandum (ATSOM) No. 36, the "Requirement to Record All Pertinent Air Traffic Data" on 18 September 2000. This ATSOM, which makes specific reference to 'face-to-face' co-ordination, has now lapsed and its content has not been incorporated in the MATS Pt 1. This report recommends that the relevant information contained in ATSOM No 36 should be reiterated.

TAC subsequently cleared the B747 for further climb, initially to FL140 and a short time later to FL170. At that stage, the subject ac were on almost parallel tracks at similar ground speeds, with the B737 to the N by 6 - 7nm. At 1738:20, the B737 was cleared to resume its own navigation direct to KOKSY; it had just vacated FL173 and the B747 was just passing FL122. The hdg change resulted in the B737 turning onto a converging track and, with B747's much higher ROC, vertical separation was quickly eroding. Nevertheless, at 1738:50, the B747 was transferred to Brussels ACC. Radar shows that, at the point of transfer, the ac are 6.6nm apart with the B747, about to cross KONAN, passing FL130 and the B737 passing FL182. Just over 20 secs later, the B737 had entered Brussels ACC airspace, climbing through FL189. TAC was content with this situation because the B737 had vacated FL170, the B747's cleared level, and he believed that the Brussels controller was aware of the B737. He thought, therefore, that the Brussels controller would continue the B747's climb subject to the B737. This proved erroneous and, unbeknown to the LACC controllers, the Brussels controller cleared the B747 straight to FL230.

At 1741:10, TAC asked the B737 pilot if he could increase ROC through FL240. The pilot responded *"Wilco"*. When interviewed, TAC explained that this request had been designed to improve the climb profile of the B737; it did not take account of the developing loss of separation, which he still had not recognised. At the time of the request, the B737 was passing FL212 with the B747, in its 2 o'clock at approximately 2.5nm, passing FL199. Even when the STCA activated, both TAC and PLN dismissed it as a 'nuisance warning', confident that Brussels ACC were climbing the B747 at least 1,000 ft below the B737. However, a short time later it was observed that vertical separation was reducing below 1,000 ft. TAC transmitted: *"... turn L immediately avoiding action L heading 060 traffic climbing up underneath."* A few seconds later he followed this

with traffic information: "... a 747 presently in your 2 o'clock range 1 mile climbing ... through your level L immediately heading N." The pilot reported visual with the traffic. A few seconds later, at 1742:00, the controller requested the B737's passing level and, upon being advised that it was passing FL230, cleared the pilot to resume his own navigation to KOKSY, adding that the traffic was: "... passing down your RHS levelling off at 215." The pilot reported turning R with the traffic in sight. TAC said that he would be taking reporting action and transferred the ac to Maastricht ACC.

In the meantime, PLN had telephoned Brussels ACC and asked them to stop the B747's climb at FL220. The Belgian authorities have requested a report on this Airprox and have provided a copy of the Brussels ACC controller's report. Additionally, the Belgian ATS provider has been contacted and asked to clarify why the Brussels controller did not observe the presence of the B737 prior to climbing the B747 to FL230. Also it has been asked to explain its understanding of the LOA, specifically how the B747 was cleared straight to FL230 when, iaw the LOA, there could have been traffic with LACC crossing KONAN at FL215 or above. A response is still awaited. The LACC unit report also makes a recommendation, which has been accepted by the DGM ATC Technical, that the procedure described in the LOA be reviewed in consultation with his counterpart at Brussels ACC. This report endorses that recommendation. At the time of writing, the response to the recommendation is still awaited.

In their written reports both crews indicate that they received RAs, although the B737 pilot made no reference to his on the LACC frequency. Radar shows that separation was lost initially when the ac were 2.3nm apart with the B737 passing FL215 and the B747, in its 2 o'clock, passing FL205. They continued to converge with lateral separation reducing to 1.3nm but by that stage, standard vertical separation had been re-established. Thereafter, the B737 turned away and the tracks diverged.

This appears to have been an isolated event. Nevertheless, based on the evidence of this Airprox, it would appear necessary to review the LOA between LACC and Brussels ACC in order to ensure that its provisions are sufficiently robust.

This report endorses the LACC recommendation, which is reproduced below.

RECOMMENDATIONS

1. The relevant extracts from ATSON No 36, the "Requirement to Record All Pertinent Air Traffic Data", should be re-issued as an ATS Information Notice or incorporated in the MATS Pt 1.
2. LACC Recommendation - In the light of this Airprox, (LACC) ATC Operations review the procedure at DVR (described in MATS Pt 2) in consultation with its counterpart at Brussels.

UKAB Note (1): Analysis of the Pease Pottage radar data recording reveals both ac tracking towards KOKSY. At 1740:21 the B737 is passing FL205, whilst the B747, at 2 o'clock range 4.35nm, is passing FL174. The ac continue to converge and CPA occurs at 1741:41 when they are 1.6nm laterally and 400ft vertically apart. On the next sweep, though lateral separation is slightly reduced, vertical separation has increased as the B747 stops climb and the B737 displays an increased ROC. Thereafter, both lateral and vertical separations increase as the B737 turns away towards the N and the B747 turns R 20°.

UKAB Note (2): Arising from Airprox 48/99, UKAB made the following recommendation:

RECOMMENDATION

That the CAA considers introducing a more formal approach to the dynamic process of face-to-face co-ordination between controllers so that an audit trail results.

CAA Action:

The CAA will commence a review of the relevant procedures at unit level and within generic requirements. The review and follow-up actions are expected to be complete by the end of June 2000.

Status – Accepted – Open

Follow-Up Action:

1. CAA is to ensure that NATS and all other civil ATC units are included formally in the review. Open

AIRPROX REPORT No 112/02.

2. NATS is conducting a trial based on 'live mics'.

NATS has undertaken a trial, the results of which indicate that current technology is unsatisfactory.
Closed

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 data video recording, reports from the air traffic controllers involved and reports from the appropriate ATC authorities.

Board members were agreed that the encounter resulted from the B737 entering Brussels' airspace without requisite co-ordination. Members noted that the responsibility for such co-ordination rested with S15/16/17 TAC, although PLN could have done so, had he been requested or had he anticipated the requirement. TAC may have been persuaded that, since both members of the control team knew the B737 was low and late on handover from TC, PLN had taken the initiative to effect co-ordination on his behalf; a mistaken impression perhaps reinforced by the statement made by PLN concerning Brussels. ATC members thought that this indicated poor teamwork, at the least, if not non-compliance with promulgated procedures. Nevertheless, as the NATS adviser reminded members, there is a clear requirement for such co-ordination to have been recorded on the FPS. However, because of the incomplete audit trail, it would remain unclear as to why TAC had assumed that co-ordination had been effected. In the event, none was and

consequently no annotation was marked on the appropriate FPS. This should have been evident to both members of the control team and thus, the Board reasoned, both must share responsibility for the omission.

Board members expressed concern that the STCA indication, the final safety net for the control team, had been dismissed by both TAC and PLN as a 'nuisance warning'. With the STCA warning disregarded, separation then eroded until such time as the situation was resolved, initially, by the pilots' compliance with their TCAS RAs. On the face of it the recorded loss of separation taken in isolation indicated a significant lapse. But given the relatively low closure speed and flight path directions, coupled with timely initiation of resolution by TCAS and the avoiding action from ATC, most Board members considered that in the end there was no risk of collision and that safety had been assured throughout.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The LACC Sector 15/16/17 (bandboxed) team did not ensure that the B737 was co-ordinated with Brussels ACC.

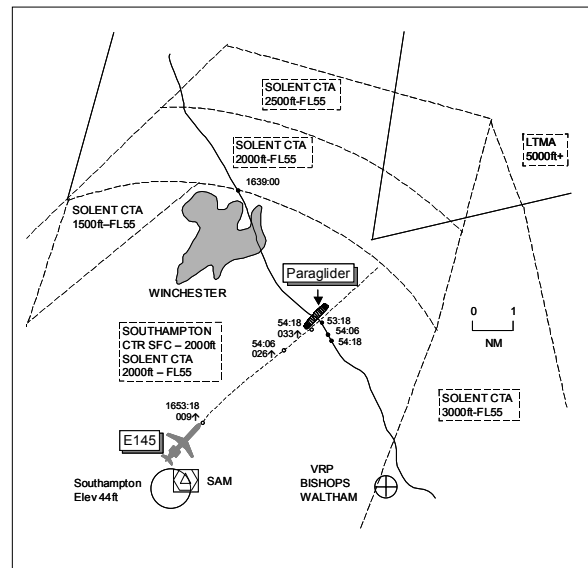
Degree of Risk: C

Endorsement: The UKAB endorsed the recommendations made by LACC and ATSI.

[Post-meeting Note: ATSI advises that ATSOM No 36 is being incorporated into MATS Pt 1 in amendment No 57, effective end of April 2003.]

AIRPROX REPORT NO 113/02

Date/Time: 14 Jul 1654 (Sunday)
Position: 5101N 0115W (5nm NE SAM
 - elev 44ft)
Airspace: CTA (Class: D)
Reporting Aircraft **Reported Aircraft**
Type: E145 Paraglider
Operator: CAT Civ Pte
Alt/FL: 3000ft↑ VFR
 (QNH 1027mb) (QNH)
Weather VMC CLBC VMC CLBC
Visibility: 10km NK
Reported Separation:
 0ft V 800m H 0ft V 0.5nm H
Recorded Separation:
 0.56nm H

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

THE E145 PILOT reports heading 050° at 200kt on departure from Southampton RW02 climbing to 5000ft QNH 1027mb. On climbing through 3000ft whilst inside the Southampton CTR, he thought, the FO/PF seated on the RHS spotted a paraglider with a red canopy in his 1 o'clock at the same level heading 120° which passed about 800m away to his R. He noted the SAM DME showed 5.4NM and informed ATC of its presence who were unaware of the traffic which was not showing on the radar. He assessed the risk of collision as medium.

THE PARAGLIDER PILOT reports flying a cross country from Combe Gibbet (approx 3nm SE of Hungerford) to Swanmore near Bishops Waltham at various levels between GL and 6000ft. He was carrying a hand-held aviation GPS which he had purchased 18 months previously but had only used it seriously for the first time on the day prior to the incident; on both days he had attempted to fly a long distance X country. He had not carried out any pre-flight planning as he had not expected to fly further than the bottom of the hill launch site and he was not familiar with the surrounding airspace as he usually flew from the Gloucester area. It was only after becoming airborne on the incident day that he found the conditions, much to his surprise, to be conducive for a long cross country and, as he did not carry a map, he had

placed reliance on the GPS equipment to give him warnings of his proximity to CAS, via the inbuilt alerting system. He had approached Swanmore from the NNW and had been given an alert that he was approaching the Southampton CTR (GL-2000ft) but as he was mainly between 3000ft and FL55, he continued to fly above the regulated airspace, he thought. However, he was apparently unaware of the Solent CTA extending to the N of and above the CTR but subsequently admitted that with hindsight he must have flown through the Class D CTA during his flight. He had saved the flight data into the data log memory section of the GPS equipment which he had used as proof of his achieved flight distance on the date in question and which he had copied to the UKAB for analysis. During his transit of the Southampton area, he had seen two 'business type' jets, one had passed well to his E and another one to his W, believed to be the reporting ac. The second one was the closest which he saw about 1-1.5nm away to his W, 2000-2500ft below climbing and which passed 0.5nm behind him to the N. After being contacted by the UKAB and BHPA, he had checked the airspace alerts settings within the GPS equipment and all Classes/categories available had been selected 'on'. He believed there had been no risk of collision.

AIRPROX REPORT No 113/02.

THE BHPA comments that the training that pilots of this level of competence receive under the BHPA's training schemes should prevent all pilots from acting as he did. The BHPA used an anonymous version of the incident as an educational piece in the house magazine, Skywings, which goes directly to over 90% of all hang and paraglider pilots in the UK. It is hoped that this, together with the anticipated CAA publication on the use of GPS in GA navigation, will help prevent the repetition of such a display of atrocious airmanship.

UKAB Note (1): The GPS manufacturer supplied extracts from the equipment manual showing Airspace Classes and alarm settings available. The GPS equipment shows the boundaries of all types of CAS on the 'moving map' page and would have alerted the pilot, as long as the alert functions had not been disabled, to his proximity to the Class D Solent CTA as well as the CTR - these warnings would show on the display irrespective of which page was in use at the time. Warnings would be given at 2nm and 1nm to run to an airspace boundary and also when 'inside' after penetration had occurred.

UKAB Note (2): Met Office archive data shows the Southampton METAR EGH1 1650Z CALM 9999 FEW045 26/10 Q1027=

UKAB Note (3): The GPS manufacturer was able to plot the Paraglider data log onto an aviation topographical chart which was subsequently overlaid onto the Pease Pottage recorded radar plot which is shown in the UKAB diagram. However, no altitude information is recorded by the GPS. The E145 is shown on recorded radar departing Southampton to the NE climbing at about 3000fpm. The GPS plot shows the Paraglider tracking SSE through the Solent CTA and crossing the Southampton CTR boundary at 1639:00. Assuming that the GPS data log timings are accurate, at 1653:18, as the E145 is first seen on recorded radar climbing through FL009 (1300ft Southampton QNH 1027mb), the Paraglider would have been crossing through its 12 o'clock range 4nm tracking 160° with a G/S averaging 25kt. At 1654:06 as the E145 is climbing through FL027 (3100ft QNH) when the pilot reports first seeing the conflicting traffic, the Paraglider is estimated to be in the E145's 1 o'clock range 1.2nm. The CPA is estimated to occur 12 seconds later as the E145 climbs through FL033

(3800ft QNH) and passes 0.56nm NW of the Paraglider.

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, GPS data log, reports from the air traffic controllers involved and reports from the appropriate ATC authorities.

Members were highly critical of the Paraglider pilot's relaxed attitude to his flight. The serious connotations should have been apparent from the outset, before he attempted to get airborne. His first error was in not carrying out any pre-flight planning to familiarise himself with the surrounding airspace. Secondly, he did not carry a map to ensure he could navigate safely clear of controlled/regulated/restricted or prohibited airspace. Instead, he had placed 'blind faith' in a 'hand held' aviation GPS receiver to issue airspace warnings without really understanding how to use the instrument. This item of equipment is designed to supplement normal methods of navigation, not to be used as a primary/sole means. Members were clear that the gross lack of airmanship displayed by the Paraglider pilot was tantamount to acting in a reckless manner. Because of his disregard of basic flight planning and airmanship, he had entered Class D airspace without clearance which had caused the Airprox.

Although this was probably an isolated case, members were concerned that it exposed what unregulated flying activities could generate. It was acknowledged that responsible 'umbrella' organisations 'regulated' their own members well through training schemes, but the bottom line was that no legal requirement existed for unlicensed pilots to complete any formal training or take any exams prior to flight. With this in mind, the Board decided a formal look at the arrangements surrounding unregulated flying activities should be undertaken to take stock of the situation and produced a recommendation to such effect to the CAA.

Looking at risk, the Solent APR was oblivious to the Paraglider's airspace incursion and only became aware of its presence when the departing E145 pilot told him. The E145 pilot saw the

crossing Paraglider in his 1 o'clock at the same level, already diverging to his R, and he watched it pass 800m away and clear to the SE. For his part, the Paraglider pilot saw the climbing E145 1-1.5nm to his R and 2-2500ft below; he watched it pass to the W and behind climbing through his level. From the geometry of the encounter, the flight profiles were never going to collide. This persuaded the Board no risk of collision had existed.

PART C: ASSESSMENT OF CAUSE AND RISK

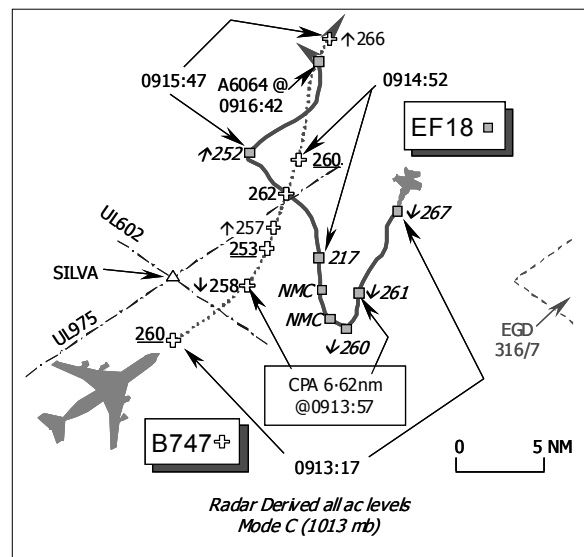
Cause: Acting in a reckless manner, the Paraglider pilot entered Class D airspace without clearance.

Degree of Risk: C

Recommendation: In light of this incident, the CAA should consider looking at arrangements surrounding unregulated flying activities in UK airspace.

AIRPROX REPORT NO 114/02

Date/Time: 15 Jul 0914
Position: 5358N 0052E (6½nm E of SILVA)
Airspace: UAR/MRSA (Class: B)
Reporting Aircraft Reported Aircraft
Type: B747-200 EF18
Operator: CAT Foreign Mil
Alt/FL: FL260 FL250↓
Weather NIL CLOUD VMC CLOC
Visibility: 'Good' 10km+
Reported Separation:
 Not seen 3nm H, 500ftV
Recorded Separation:
 6.62nm H, 300ft V



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE B747-200 PILOT reports he was outbound from Manchester on course to DANDI under an ATC service from LACC. In level cruise at FL260, eastbound at 330 kt, he received a TCAS RA - "DESCEND - DESCEND" - demanding a descent at 1500 ft/min against traffic at 1 o'clock. He complied with the RA immediately by descending at the indicated rate and entering a L turn, which enabled him to avoid an imminent collision. The other ac was not seen but London CONTROL was informed.

THE EF18 PILOT reports he was participating in an air combat sortie within the Air Combat Manoeuvring Instrumented Range (ACMI) – EGD 316/7 [5000–55000ft]; HISLs were on. Though originally an element of a formation his ac was unserviceable on start-up, necessitating a 'ground abort' and ac change, thus, he departed from Waddington as a single ac. Operating within the ACMI on the dedicated ACMI frequency [UKAB Note (1): Under a Range Monitoring Service from Brough – not an ATS] – squawking A0464 with Mode C, he reports that the ACMI tracking system was not working. Furthermore, the ac inertial

AIRPROX REPORT No 114/02.

navigation system was in error by about 30nm, but *"with no cockpit indications nor ATC advisory calls"*, the Range operator advised him to descend below FL245. At about FL250 whilst descending at 450kt in a slight R bank he spotted an airliner in level flight. He avoided the airliner visually and assessed the minimum separation as 3nm and about 500ft vertically, with no risk of a collision. The inertial ac position indicated at the time of the Airprox was 54°00N 001°55E, within the ACMI. [UKAB Note (2): This position is more than 1° of longitude E of the actual Airprox location].

THE LACC SECTOR 10 TACTICAL CONTROLLER (SC10) reports that the B747-200 was routeing UL975 NE bound towards SILVA, under a RCS in a slow climb to FL260. As the ac approached SILVA he spotted an ac squawking A0464 manoeuvring – the EF18 - and became concerned enough to issue a precautionary L turn to the B747 crew. He then realised that separation would be compromised as a result of the manoeuvres of the other ac, so he passed an avoiding action turn to the B747 crew and issued traffic information. The B747 crew reported they had received a TCAS RA and descended to about FL254/6. The S10 PLANNER controller spoke to LATCC (Mil) who implied that Brough had lost RT contact with the other ac.

ATSI reports that SC10 observed the potential confliction and took appropriate action, this prevented an erosion of standard separation which was never less than 5nm/1000ft.

UKAB Note (3): A review of the SC10 RT transcript reveals that at 0909:00, the controller instructed the B747 crew to *"...route direct to DANDI"*. This was acknowledged by the crew who was then instructed to climb to FL260. The B747 crew reported *"..maintaining [FL] 260"* at 0913:20, in response to a call from SC10, who at 0913:30, advised *"...roger turn left 20 degrees"*. This instruction was acknowledged by the crew, but then reinforced at 0913:50, by the SC10 who instructed *"[C/S] avoiding action turn left heading...010° there is military traffic in your right 1 o'clock same level"*. No immediate acknowledgement was forthcoming from the crew before at 0914:10, the SC10 queried *"...that traffics now..looks like its just gone down your right hand side did you receive a TCAS RA on that?"* Whereupon the crew responded

"affirmative". The B747 crew was subsequently re-cleared direct DANDI under their own navigation, climbing to FL290. After SC10 advised that he would be filing a report about their TCAS RA, the B747 crew advised they had received a *"...TCAS warning for descent and turn to the left and we followed our TCAS"*.

UKAB Note (4): A review of the SC10 PLANNER landline transcript reveals that following enquiries with ScACC to try to determine the identity of the other ac at 0915:30, the LATCC (Mil) TACTICAL SUPERVISOR EAST (LRAD TAC SUP E) called and identified an ac contact to the PLANNER at a position *"SILVA 046 [°] 4 [nm]"*, which was *"..not talking to anybody"*. From an apparent off-telephone conversation this information appears to have been passed to SC10, but only after the conflict with the B747. The subsequent conversation suggested the EF18 was *"..up and down all over the place"*.

UKAB Note (5): London MILITARY provided an ATS to the EF18 pilot whilst outbound to the ACMI and subsequently when inbound to Waddington on completion of his sortie. A review of the applicable RT transcript for Sector 06, reveals that the EF18 pilot appeared to have severe difficulties on RT understanding the controller's instructions. The EF18 pilot switched to the ACMI tactical frequency just before 0908:00. The landline transcript reveals that LATCC (Mil) Sector Controller 6 (CON6) had endeavoured to ascertain if the EF18 pilot had switched back to his frequency after 0913:00, when a broadcast was made to the EF18 pilot. Subsequently, just after 0916:00, the EF18 pilot called CON6, who instructed the pilot to squawk A6064, whereupon the flight was identified and instructed to descend to FL150 for return to Waddington. When questioned by CON6 *"..did you manage to speak to the ACMI at all because they say they didn't have you"*, no reply was given by the EF18 pilot. The flight was handed over to Waddington just after 0924:00.

THE BROUGH RANGE MONITORING SERVICE (RMS) MANAGER REPORTS with landline cassette recording, that Brough provides a radar safety monitoring service for N Sea ACMI operations within EGD 316/7 using the Claxby onward routed radar data service, fed to two Watchman consuls. The operators located at Brough monitor RT and radar and provide

warnings/information to relevant agencies over dedicated landlines – here to SHOWGROUND the tactical ACMI range operator – located at Waddington. Brough does not have direct 2-way RT to transmit direct to pilots on the range. The recordings reveal that his staff provided appropriate warnings to Showground in accordance with unit procedures [UKAB Note (6): Who endeavoured to communicate this to the EF18 pilot]. Information was also passed to LATCC (Mil) and LACC when they observed the EF18 leaving the lateral confines of the ACMI above FL245.

UKAB Note (7): The ACMI Manager at Waddington reports that the applicable SHOWGROUND ACMI RT frequency recording was erased.

UKAB Note (8): The LATCC (Mil) Claxby radar recording shows at 0913:17, the B747 cruising at FL260 Mode C, NE bound about 3nm S of the centreline of UL975. Simultaneously the EF18 is shown SW bound squawking A0464 descending through FL267 unverified Mode C in the MRSA, 4nm S of the centreline of UL975 and well outside the confines of EGD316/7. The B747 crew reported TCAS descent and the avoiding action turn initiated by SC10 is shown at 0913:57, the airliner descends through FL258 - 6.62nm W of the EF18, which is 300ft above it descending through FL261 at the CPA. The airliner descends to FL253 – a maximum excursion of 700ft below assigned level – in the turn onto 010°. Meanwhile, the EF18 turns NNW and descends clear of the B747 into the MAS, indicating FL217 at 0914:52, as the B747 levels at FL260. The EF18 then climbed back into the MRSA at 0915:47, before switching to London MILITARY, who assigned a squawk of A6064, which the EF18 is shown transponding at 0916:42, indicating FL216 Mode C, before setting course for Waddington.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available to the UKAB included reports from the pilots of both ac, transcripts of the LATCC (Mil) and LACC RT frequencies, radar video recordings, reports from the LACC air traffic controller involved and the ACMI RMS agency, together with a landline recording.

Commercial air transport pilot members believed that the B747 pilot had complied promptly with the TCAS RA, but that he had omitted to include in his report that the L turn was in response to the avoiding action issued by SC10. The controller was commended for his prompt and decisive action, which coupled with the pilot's responses had ensured that standard separation was not eroded.

The Board recognised that the unserviceability of his first ac had caused the EF18 pilot to depart Waddington late and as a singleton – instead of being led to the ACMI in formation as had been planned. Some fast-jet pilot members believed that this might have had a significant impact on his subsequent conduct of the sortie, which had all the makings of a flight safety lesson about what can go wrong on the first flight on a Monday morning. That the pilot might have departed from Waddington in the wrong frame of mind from the outset was only speculation on the part of the Board, but such events are not conducive to flight safety and that was evidently not the only problem he encountered during this flight. Some highly experienced fast-jet pilots called into question the supervisory aspects of this case and wondered if the pilot should have flown the sortie at all from all that transpired – but that was in retrospect. Difficulties were experienced by CON6 when he was passing instructions to the EF18 pilot, who did not seem to comprehend the questions asked of him after departure from Waddington. The LATCC (Mil) transcript evinced the controller's difficulties in eliciting information from the EF18 pilot and his poor understanding of ATC instructions, which to the civilian controller members was of great concern. Members believed this was indicative of a pilot whose comprehension of English was somewhat less than perfect; an observer, intimately familiar with ACMI sorties from Waddington, reinforced this point and believed that, in general, wingmen were heavily reliant on their formation leaders. In many foreign countries, military pilots are not accustomed to ATC instructions being given by military controllers in English – more normally their native tongue – so controllers here are very often called upon to exercise great patience when issuing complex ATC instructions to foreign pilots. However, the solo flight out to the ACMI was essentially a VFR middle airspace transit, which should have presented little difficulty.

AIRPROX REPORT No 114/02.

Events took on a different perspective when the EF18 pilot left CON6's frequency some six min before the Airprox occurred, because he no longer had the benefit of an ATS, and evidently at some stage - it was unclear exactly when - the EF18's inertial navigation system failed, unbeknown to the pilot at the time. Some members postulated that the unexpected delay, followed by a rushed departure to meet the time constraints of the ACMI 'slot', might have promoted an unwitting misalignment of the inertial navigation platform before take-off – but that again was speculation. From the EF18 pilot's report, he had evidently believed he was still within EGD316/7 at the time of the Airprox, but recorded radar data revealed otherwise. The apparent ACMI equipment failure appears to have presented the EF18 pilot with some difficulties also. A recording of the SHOWGROUND Tactical frequency was not available, but the Board speculated that similar RT difficulties might also have ensued there. The radar recording had shown that the EF18 pilot was outside the horizontal confines of the ACMI above FL245, which is contrary to established procedures. Members queried if the pilot had been given a procedure brief, but the Board was assured that comprehensive briefings are conducted 'face-to-face' at Waddington covering all aspects of the exercise. Thus, the EF18 pilot should have been aware that for any period of flight outside the lateral confines of the ACMI he must already be established under a RCS from London MILITARY, or, be flying below FL245 - clear of CAS. All this was rendered irrelevant however, because the pilot's navigation equipment indicated (falsely) that he was still inside the ACMI danger area. It was explained that SHOWGROUND does not have a radar display to show intruders into the ACMI or if participating ac stray outside – all they can see is the telemetry from the participating ac. Therefore the proximity of the B747 would not have been evident to the tactical operator who was reliant on such information being supplied over the telephone by the RMS located at Brough. There was little more Brough RMS could do other than warn SHOWGROUND (and also LACC), and it was evident from the landline cassette recording provided by Brough that the operator had done just that. Some civilian controller members were concerned that no direct 2-way RT

communication existed between a qualified controller and the participating pilots. Moreover, it was unclear to the Board if the EF18 pilot ever established satisfactory RT contact with SHOWGROUND - his report suggested that he had received advice to descend below FL245 eventually - but it was unclear when, and he had not answered this question directly when asked by CON6 after the Airprox had occurred.

What was clear from the radar recording was that the EF18 was both above FL245 and outside the lateral confines of EGD316/7 at the CPA. Hence, the EF18 pilot had penetrated the Class B airspace of the London Mandatory Radar Service Area without clearance, where flight under a RCS was mandatory. The Board concluded that this was the cause of this Airprox, insofar as the EF18 pilot did not comply with ACMI procedures and penetrated Class B CAS without clearance and had flown into conflict with the B747. The subsequent TCAS RA descent followed by the B747 pilot, together with the avoiding action turn initiated by S10, resolved the conflict without any erosion of standard separation. Furthermore, the EF18 pilot had kept the airliner in sight and avoided it visually, although this was not a see and avoid environment and VFR flight was not permitted adjacent to the UAR in Class B airspace. But it was evident that several safety nets had all played their part in preventing these two ac flying into unsafe proximity, therefore, the Board concluded that no risk of a collision had existed in the circumstances reported here.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The EF18 pilot did not comply with ACMI procedures and penetrated Class B CAS without clearance and flew into conflict with the B747.

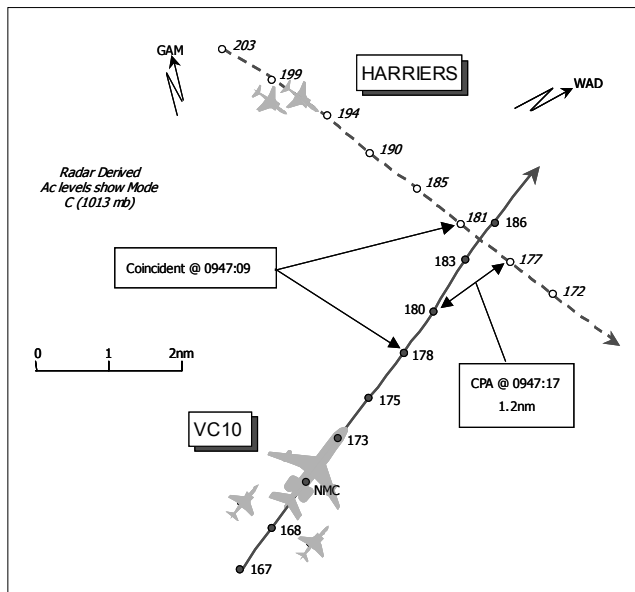
Degree of Risk: C.

Contributory Factors:

- a. The EF18's inertial navigation system error.
- b. The EF18 pilot's apparent difficulty in understanding instructions.

AIRPROX REPORT NO 115/02

Date/Time: 12 Jul 0947
Position: 5304N 00051W (12nm SW Waddington)
Airspace: London FIR (Class: G)
Reporting Aircraft Reported Aircraft
Type: VC10 Harrier GR7 x 2
Operator: HQ STC HQ STC
Alt/FL: FL180↑ 17,370ft↓
 (QFE 1002mb)
Weather VMC CLAC VMC CLAC
Visibility: UNL UNL
Reported Separation:
 Nil V, 0.5nm H 1000ft V, 1nm H
Recorded Separation:
 300ft V, 1.2nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE VC10 PILOT reports that he was leading a pair of Sea Harriers en route from Brize Norton to Keflavik and in receipt of a RIS from London Mil on 278.07 MHz. Whilst heading 035° at 400 kt and passing FL195 in the climb, he thought, he was advised by London Mil of fast moving traffic 10 o'clock range, 20nm at FL210. This was subsequently updated at 11 o'clock range 10nm and 11 o'clock range 5nm. Two Harrier GR7s were then sighted at 1130, range 2nm moving L to R. They passed across the nose descending and were approximately 0.5nm away when they passed through his level. They continued away into his 3 o'clock, heading about 160° and descending. No avoiding action was taken as the Harriers were sighted too late and he assessed the risk of collision as medium.

He also reports that his ac was coloured grey and that HISLs were on. The LH wingman of his formation, a Sea Harrier, also saw the Harrier GR7s and described the distance as "close".

THE HARRIER GR7 FORMATION LEADER reports that his No 2 was on the R in arrow formation. He was heading 170° at 350kt and in descent to 2000ft (Cottesmore QFE 1002mb) for a visual recovery to Cottesmore having just been handed over to Cottesmore by London Mil.

During the handover, traffic had been called but by the time of the reported incident he was in receipt of a RIS from Cottesmore Approach on 358.725MHz. The same traffic was also called by Cottesmore Approach. The VC10 and 2 accompanying Sea Harriers were identified at a range of 8 miles. The descent was continued as no infringement was perceived. Visual contact was maintained until the VC10 passed above and behind in his 7 o'clock. At no stage was there any danger to either ac. He adds that both ac in his formation were camouflaged grey and HISLs were selected on.

MIL ATC OPS reports that the VC10 tanker formation was in receipt of service from London Mil Controller 31 (CON 31) whilst in transit through the Lichfield Radar Corridor (RC). At 0944, the VC10 pilot was asked what type of service was required on leaving the RC. As the VC10 formation cleared controlled airspace CON 31 downgraded the service to RIS and approved climb to FL220. Immediately thereafter traffic, the Harrier GR7 pair, was called "... traffic left 10 o'clock, 20 miles crossing L R, fast moving indicating FL240". This was acknowledged by the VC10 pilot. At 0946 a London Mil East squawk was allocated to the VC10, in preparation for internal handover, together with a traffic update"...

AIRPROX REPORT No 115/02.

previously reported traffic L 11 o'clock, 10 miles crossing L R, fast moving indicating FL210 descending". The VC10 pilot confirmed he was looking for the traffic. CON 31 then called London Mil Controller 11 (CON 11), who already had the electronic flight strip and would otherwise be expecting a silent handover, to advise him that the Cottesmore traffic, the GR7 pair, had been called. CON 11 responded "once clear, then 277.77". CON 31 then gave the VC10 pilot a further traffic update "... previously reported traffic, L 11 o'clock 4 miles L R, fast moving indicating FL 195 descending" to which the VC10 pilot replied that he was "... visual with that traffic". Accordingly, CON 31 instructed the VC10 pilot to change to 277.77MHz. This was delayed, however, when the VC10 pilot asked CON 31 "... was that traffic co-ordinated against us, just crossed our nose?". CON 31 stated that under RIS the traffic had been "called in". Further discussion took place as to whether the traffic had been in receipt of a service at the conclusion of which the VC10 pilot advised CON 31 that "... they crossed our nose at less than a mile descending through our level that's, I'm very tempted to call that an Airprox" and he would "have a think about it in the cruise and may do so". The formation was then transferred to 277.77MHz.

Meanwhile, at 0945:21 Swanwick Mil LJAO NW Sector controller commenced handover of the Harrier GR7 formation to Cottesmore Supervisor (COT SUP); the pair was in descent to FL100 and under RIS. During the handover the LJAO NW controller advised COT SUP that he would call conflicting traffic, the VC10 formation, that was "R 1 o'clock, range 10 miles crossing R - L ... climbing to FL220". Consequently, the Harrier GR7 formation was accepted by COT SUP on behalf of his Approach Controller. The Harrier Formation Leader made contact with Cottesmore Approach at 0946:30 and was "identified, descending FL 60, radar information". At 0946:42 traffic information on the VC10 formation was given as "... traffic R 2 o'clock, 6 miles crossing R to L, indicating FL 180 climbing" to which the Harrier Leader responded "... visual with the VC10 and the 2 chicks". The Harrier GR7s subsequently recovered to Cottesmore without further incident.

law JSP 318A Reg 235.115, under RIS a controller will inform the pilot of "...the bearing, distance and, if known, the level of the conflicting traffic" and the pilot is "wholly responsible for

maintaining separation". Moreover, "the controller will only update information, after the initial warning, at the pilot's request or if the controller considers that the traffic constitutes a definite hazard". On this occasion updates were given to both crews to ensure they were kept apprised of the traffic situation and enable visual acquisition. Accordingly, all controllers involved in this incident discharged their responsibilities fully.

THE VC10 PILOT'S UNIT states that this was another confliction in Class G airspace where, although the VC10 crew saw the GR7 formation, they were poorly placed to take any timely action to increase separation as they had 2 ac in close formation. There is a suggestion that the GR7 formation was being controlled by Cottesmore ATC. Whilst there may have been a good reason for this to be the case, it seems counter-intuitive to have several ac in the same portion of airspace being controlled separately. If the GR7 formation was visual with the VC10 formation and felt that enough separation had been achieved, they may have misjudged. The VC10 captain was uncomfortable and an accompanying Sea Harrier pilot also expressed his concern.

THE HARRIER PILOT'S UNIT states that the Harrier pilot's narrative has a note of bemusement as he clearly considers that having seen the other ac at some 8 miles, and maintained visual contact until the other ac passed behind his formation, there was never any problem. Although the VC10 crew is used to flying with FJs, it may still be the case that the manoeuvrability and acceptable separation distances may differ between operational functional types. The Harrier pilot saw, having been notified, and maintained separation; as he mentions no further calls from ATC, presumably they were also happy.

HQ STC comments that while the Harrier GR7s were content they would always avoid the VC10 formation, and complied with the 'see and avoid' requirement of the airspace, FJ crews should note that comfortable separation distances for FJs are sometimes not seen as such by tanker/transport crews. Having seen the VC10 at considerable distance, it would have been more considerate if the Harrier GR7 formation leader had engineered greater vertical separation, and made a small turn to pass astern (crossing behind affords greater comfort to other ac than crossing in front). While Mil ATC provided the appropriate RIS as

requested by both formations, the VC10 pilot appears to have expected a RAS. Transport crews should be aware that if they request a FIS or RIS they cannot expect to be given avoiding action, nor can they expect other aircraft to provide wide separations in Class G airspace.

UKAB Note (1): Analysis of the Claxby radar data recording reveals that the VC10, squawking 6111 with Mode C maintaining a steady NE track. At 0946:29 the VC10 is passing FL167 in the climb, whilst the Harrier GR7 pair, leader squawking 4621 with Mode C, 11 o'clock at 7.2nm tracking SE and passing FL203 in the descent. At 0947:09 the Harriers are passing FL181 and about to cross 1.8 nm ahead of the VC10, which is passing FL178 in the climb. CPA occurs on the next sweep when the Harriers are 1 o'clock to the VC10, range 1.2nm and passing FL177 in the descent, whilst the VC10 is passing FL180 in the climb. No separate primary radar returns are evident from the Harrier GR7 No 2 to provide his position in relation to the VC10 formation.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

from the appropriate ATC and operating authorities.

It was evident to members that, despite both pilots being in receipt of a RIS, their respective expectations seemed to differ. Indeed, some pilot members suggested that, possibly, the VC10 pilot may have chosen an inappropriate form of service. Members also noted the disparity between respective separation estimates, although pilot members thought that, given the conditions it was probably significantly easier for the Harrier GR7 pair to see the tanker combine. Consequently, because the VC10 pilot acquired the Harrier GR7 pair much later, it was probable that the VC10 crew underestimated their range, which radar information confirmed to be over 1.2nm when they crossed the VC10's nose. This, coupled with the fact that neither pilot felt compelled to change his flightpath, persuaded the Board that there was no risk of collision. Nevertheless, pilot members concurred with the comments by HQ STC regarding different perceptions of "comfortable" separation distance.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Sighting report

Degree of Risk: C

AIRPROX REPORT No 116/02.

AIRPROX REPORT NO 116/02

Date/Time: 15 Jul 1327

Position: 5104 N 0132 W (4nm SSE Middle Wallop - elev 297ft)

Airspace: MATZ (Class: G)

Reporting Aircraft Reported Aircraft

Type: JetRanger Squirrel HT2

Operator: Civ Comm HQ DAAvn

Alt/FL: 300ft 150ft agl

(QFE 1010mb) (Rad Alt)

Weather VMC CLOC VMC CAVOK

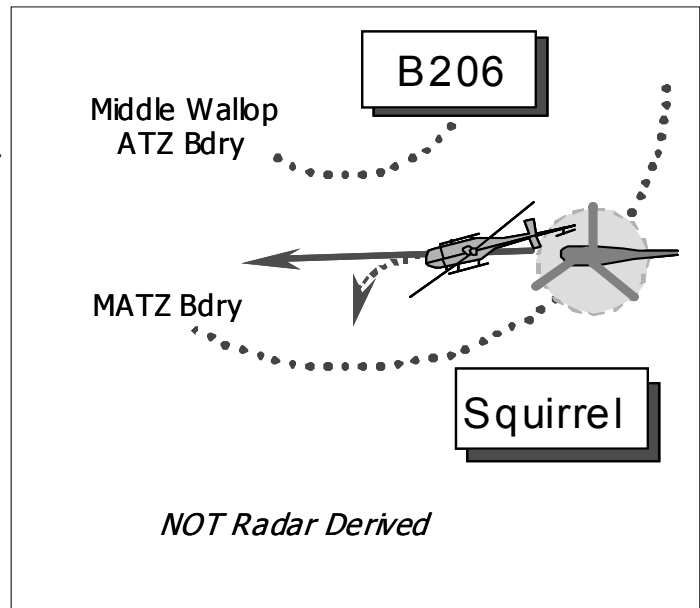
Visibility: 20nm "Excellent"

Reported Separation:

100ft V Not seen

Recorded Separation:

Not recorded



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE B206 JETRANGER PILOT reports his helicopter has a silver/black livery and the HISL was on, whilst conducting a notified pipeline inspection flight with an observer. The helicopter powerline/pipeline inspection squawk of A0036 was selected with Mode C, but neither TCAS nor any other form of CWS is fitted.

He had departed from Thruxton for Henstridge and was operating under a FIS from Boscombe Down in the vicinity of a farm strip at Bossington near Horsebridge - inside the Middle Wallop MATZ - whilst orbiting L at a steep AOB to look at what they thought was a drainage trench. Spiralling down at 60-80kt on the second time around, descending through 300ft another helicopter - a yellow/black single engine Squirrel - appeared in the chin window from behind as it passed in level flight 100ft below his helicopter. They had not seen the Squirrel before this despite looking out; the orbit was continued as the Squirrel flew to the SW weaving through the trees at about tree top height. He assessed the risk of a collision as "high" and a "lucky miss".

There was no known traffic in the area and he was just about to upgrade the FIS to a RIS, but he believed that neither his helicopter nor the Squirrel

was seen on Boscombe's radar. He added that they were over a ridgeline with the ground dropping away to the NE & S; he eventually rolled out on E, but there had been no time to take avoiding action.

THE SQUIRREL HT2 PILOT, a QHI, reports his helicopter has a black fuselage with yellow upper works and the HISL was on, whilst instructing a student on an 'observation' sortie in CAVOK conditions. He was in communication with SALISBURY OPS A/G station (SALOPs) on 282.25MHz under a FIS - he thought - and squawking A2676 with Mode C, but neither TCAS nor any other form of CWS is fitted. At the time and location of the reported Airprox he was heading 270° at 90kt flying at 150ft agl, but the JetRanger helicopter flown by the reporting pilot was not seen at all.

MIL ATC OPS reports that the timing accuracy of the RT recording transcript cannot be determined as a result of ATC equipment problems that had been reported to HQSTC in June. The B206 JetRanger pilot called Boscombe Down ZONE at 1311:30, and reported at "...500agl and below..." followed by details of the sortie, which was to "... come into the MATZ and the ATZ...up to Boscombe

southern boundary...westbound to go north side of Old Sarum...towards Salisbury...". ZONE passed the Boscombe QFE (1010mb) and instructed the B206 pilot to fly "not above 500ft" and placed the flight under a FIS. The JetRanger pilot reported "... running down to Salisbury..." at 1316:24, and requested a "...reciprocal track on the way back out if we may." This was not disputed by ZONE who obtained a clearance from Porton Down for the JetRanger pilot's requested transit through the "... very south-western tip of Danger Area 127...". At 1325:00, the JetRanger pilot reported clear of D127 and "...routeing towards Romsey area...". This track should have kept the ac outside the Middle Wallop MATZ. However, it is standard practice for ZONE to work VHF transit traffic through the area and the ZONE controller reports that information was passed to Middle Wallop ATC about the JetRanger as a MATZ crosser. Unfortunately, no transcripts of the land-line conversation are available from Boscombe Down as a result of reported equipment problems. At 1333:06, the JetRanger pilot reported "... an Airprox...within the last few minutes...". Whereupon ZONE reported that there was "no primary contact on the aircraft...", additionally the JetRanger's A0036 squawk had been intermittent because of the ac's low altitude. The Squirrel was unknown to ZONE and not observed on radar at all.

Under a FIS a controller may issue a warning to a pilot when he "... suspects, from what ever source, that a flight is in dangerous proximity to another aircraft...". JSP 318A 235.125.1d also states that "... it is accepted this information may be incomplete..." and that the controller is not responsible "... for its issuance at all times or for its accuracy." As the Squirrel was not visible to the Boscombe Down controller, no warning could be issued.

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

UKAB Note (2): NOTAM UKLB 3931, transmitted 141226Z Jul, notified the activation of the applicable PINS Gas areas surrounding the location of this Airprox – J2;K1;K2 & K3, between 11-1600 UTC on 15 Jul.

UKAB Note (3): The UK MIL Aeronautical Planning Document at Vol. 3 Part 1 Pg. 1-2-1-4 (LFA 1A) promulgates a warning only of LA10, the Light Aircraft Site at Bossington. No Mandatory

avoidance criteria are specified for this site, which is in the immediate vicinity of the position of this Airprox.

HQ DAAvn comments that the incident could have involved either of two Squirrel helicopters operating close to that position at the time. Neither of them reports seeing the B206. Nonetheless we believe that we have debriefed the likely crew, who were conducting a properly authorised sortie of the Army Pilot's Course. They were operating in accordance with an established low-level departure to the SW and on the appropriate frequency for Salisbury Ops. The fact that the Captain thought he was in receipt of a FIS from SALOPs is in error and has been raised as a matter of standardisation with the squadron concerned.

We are surprised that the B206 pilot reports that he was about to upgrade from a FIS to a RIS when operating at only 300ft and descending! In the circumstances we believe that the onus for deconfliction remains as heavily, if not more so, with a pilot in a spiral descent as it does with one on a direct low-level transit.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available to the UKAB included reports from the pilots of both ac, and reports from the appropriate ATC and operating authorities.

The position of a pipeline marked on the 1:500,000 LFC led the Army helicopter pilot member to suggest that this Airprox had not occurred in the position reported but some distance to the W. However, the pipeline marked on the 1:500,000 LFC was not necessarily the same pipeline as the one in this incident; the location had been specified by the B206 pilot as a 10 figure grid reference and the location referred to by name, which all correlated. Neither the absence of recorded radar data, nor a sighting by the Squirrel pilot, helped assessment of this Airprox, and it was mentioned that the availability of information on pipeline location was scant. Indeed, the chairman explained that although pipeline routes are known to the respective companies, a chart which showed ALL those subject to aerial inspection under PINS was not available generally to airspace users. Moreover,

AIRPROX REPORT No 116/02.

a recommendation had been made by the PINS Working Group to the CAA with respect to producing a chart which showed all the relevant pipelines. A helicopter pilot member suggested that if the pipeline route crossed the established LL departure route from Middle Wallop, then it would be beneficial to effect deconfliction with PINS helicopters when they are known to be conducting inspections under PINS. One member opined that the warning provided under PINS was so unspecific as to be of little practical value. Nevertheless, the Board noted that Middle Wallop ATC had been made aware of the PINS helicopter's transit by ZONE, but it was not clear if the Squirrel crew had been apprised of this before they switched to SALOPs. The Army member explained that it was SOP for Squirrel pilots to switch straight from TOWER to SALOPs and from the ZONE controller's perspective, he would therefore have been unaware of the Squirrel. Moreover, ZONE did not expect the B206 to enter the Middle Wallop MATZ and the route specified by the B206 pilot - from the SW tip of EGD127 towards the Romsey area - should not have taken it into the MATZ. Nevertheless, a helicopter pilot member believed that the description passed on RT by the B206 pilot was a general indication of intentions and he would have been following the route of the pipeline toward the Romsey area, which was significantly different to a direct track. He added that there would be little reason to fly more than 100m away from the pipeline whilst engaged on this inspection task, which was to check for any sign of activity that might effect the physical integrity of the line. All this added weight to the PINS Working Group's recommendation, as the Board agreed more information on the location of these pipelines would be beneficial to aviators and ATC alike.

Though not obliged to do so by military regulations, ZONE was clearly unable to provide any additional collision hazard warning about the proximity of the Squirrel to the B206. Even if a RIS had been requested, the Mil ATC Ops advisor said it would have been refused at the altitudes used here, moreover, the Squirrel was not shown on the Boscombe radar display. The Board recognised that in this situation the onus fell equally with both helicopter pilots to see and avoid each other's ac in this VFR environment. Discussion therefore turned to the effectiveness of each pilot's lookout. A helicopter pilot member opined that the

JetRanger pilot would have taken a good look into the area he was intending to descend into beforehand. However, this manoeuvre also warranted a good all-round lookout wider afield to disclose any approaching ac as once the steep LHD spiral was initiated normal lookout would be impaired. The DASC advisor opined that the JetRanger pilot seated in the RHD seat would have been unable physically to see anything approaching from outside the turn unlike the Squirrel crew who were flying straight and level. By the time he was on his second full turn, the JetRanger pilot was still unaware of the Squirrel 100 ft below him until he saw it emerge from beneath his ac with no time to do anything about it. The Board concluded this was effectively a non-sighting. Turning to the Squirrel cockpit, the B206 should have been skylined above the ridge in plain view to the crew as they approached from the E. The spiral descent of the conspicuous silver/black JetRanger should have attracted attention to it, but the Squirrel crew apparently underflew it, unsighted and oblivious to its presence. This was both surprising and perplexing. The Board concluded unanimously that this Airprox had resulted from effectively, a non-sighting by the B206 pilot and a non-sighting by the Squirrel pilot.

No recorded radar data was available to confirm the relative geometry reported when determining the risk inherent here, but there was no reason to doubt the veracity of the B206 pilot's report as the sole witness to the event. In the Board's view, neither pilot was able to effect the outcome of this encounter as the Squirrel passed 100ft beneath the descending B206. Any separation that existed was purely fortuitous and the only pilot who saw it reports that he was unable to effect any avoiding action in the time available. The Board agreed, again unanimously, that an actual risk of collision had existed in the circumstances described here.

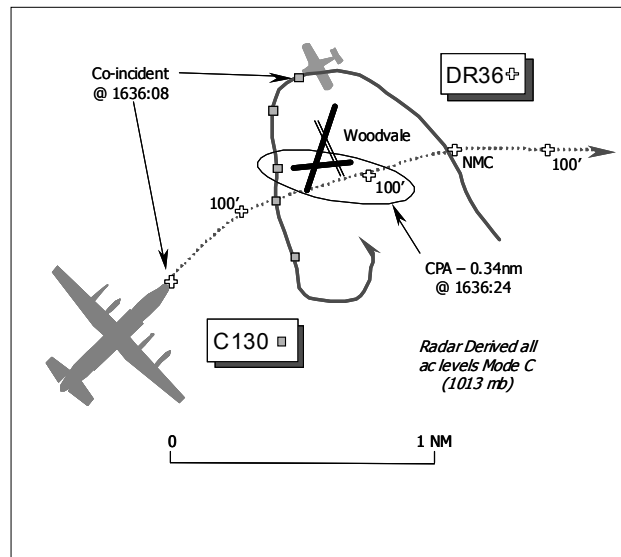
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Effectively, a non-sighting by the B206 pilot and a non-sighting by the Squirrel pilot.

Degree of Risk: A.

AIRPROX REPORT NO 117/02

Date/Time: 15 Jul 1636
Position: 5335N 0303W (Woodvale - elev 37ft)
Airspace: Woodvale ATZ (Class: G)
Reporting Aircraft Reported Aircraft
Type: Robin DR36 Hercules
Operator: Civ Pte HQ STC
Alt/FL: 700ft 3-400ft
 (QNH 1025mb) (RPS 1021mb)
Weather VMC CLBC VMC CLOC
Visibility: >10km 5km
Reported Separation:
 400ft V, nil H Not seen
Recorded Separation:
 0.34nm

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

THE ROBIN DR36 PILOT provided a very comprehensive report stating he was inbound to Woodvale - where his ac is based - after returning from Northampton Sywell. The ac colour scheme is white/orange/black and HISLs were on.

He left the Manchester CTA via KIRKBY VRP at 1400ft - as cleared by Liverpool APPROACH - not above 1500ft QNH (1025mb). The cloud base had lowered - but he could see the coast - and switched to Woodvale on 121.00 MHz. He made two calls, but did not receive a reply. The 'after hours routine' when operating at Woodvale is to transmit position and intentions on 121.00 MHz, which he did - adding his height. As he approached the aerodrome the cloud base had lowered and he made a blind broadcast call once again, saying that he would over fly the aerodrome at 1000ft. A Seneca pilot then called him on 121.00 MHz passing W abeam Woodvale, so he told the Seneca pilot that the aerodrome was closed and advised he was returning to Woodvale from the SE at 1000ft with the aerodrome in sight. He over flew the aerodrome, after descending to 800 ft, with the windsock to his L and gave a blind call "[C/S] will take RW35 left hand", [a disused RW] followed by turning onto the downwind leg heading 170° at 90kt and

another blind call, "[C/S] downwind for RW35 left hand". Because of wisps of cloud around he had descended to 700ft so as to keep clear. At this point a C130 Hercules became visible in front of his port wing after it had passed 400 ft diagonally beneath his ac from R – L. It made a low pass of the aerodrome W – E and climbed out in a R turn. As he did not know its pilot's intentions, whether it would land – do another low pass – or if there were other ac accompanying it, he transmitted on 121.00 MHz "to aircraft just overflown RAF Woodvale I am a light ac in circuit at present downwind for RW35 left hand". He closed the throttle, applied full flap, turned base leg, gave another call to say he was on base leg, turned finals, gave another call, landed and quickly cleared the runways in case the C130 was landing.

After shutting down he went over to the Police helicopter facility to see if they had been listening on the frequency, but they only listen out on 121.00 MHz when in the helicopter. They had however seen the C130 and his ac. The police pilot had only landed himself 10min beforehand. An Airprox was subsequently reported direct to AIS (Mil).

AIRPROX REPORT No 117/02.

THE C130 HERCULES PILOT reports his ac has a grey camouflage scheme, but HISLs were on whilst operating at low-level in VMC 500ft below cloud, with an in-flight visibility of 5km in haze. Heading 90°, at 240kt running in towards Woodvale from the W at an altitude of 3-400ft RPS, he approached the aerodrome over the golf course to the SW and made a level turn onto E over the aerodrome. Blind transmissions were made on all the frequencies published within the RAF FLIP BINA entry for Woodvale, but no responses were heard, neither was any other ac seen.

He added that he had also pre-notified his transit flight to ATC beforehand.

UKAB Note (1): In a telephone conversation the Robin pilot emphasised that no RT calls were heard from the C130 crew, though he had spoken to a Seneca pilot transiting the vicinity. He opined that if the C130 pilot had been monitoring 121.00 MHz, he should have heard his blind calls as he joined the Cct.

UKAB Note (2): From Met Office Archive data the HOLYHEAD RPS for 1600 – 1700 UTC was 1021mb and the BARNSELEY 1020mb. The 1600 UTC Liverpool QNH was 1026mb.

UKAB Note (3): The UK AIP at ENR 2-2-2-6, promulgates Woodvale ATZ as a circle radius 2 NM, centred on RW04/22, from the surface to 2000ft above the aerodrome elevation of 37ft and active in Summer from 07 – 1700. It specifies that ATC is available on 121.00 MHz. Woodvale does not have a MATZ.

UKAB Note (4): The applicable RAF FLIP En Route Supplement BINA (effective 30 May 02) – Woodvale – COM – promulgates the frequencies for Woodvale as: APP 312.8 MHz, 121.00 MHz; TWR: 259.95 MHz, 119.75 MHz, available to meet operational requirements, with an A/G Stn C/S AEROCUB operating on 123.5 MHz. The ATZ is also noted as operational during aerodrome hours: 07 – 1700. A further entry at RMKS 4 stipulates: *“Light acft activity sunrise to sunset outside of aerodrome hours”*, adding *“H24 outside published hours for Police helicopter activity, up to 1000ft”*.

THE C130 PILOT'S UNIT comments that the ac Captain was unaware of the light ac. Prior to his

flight, and as a part of his pre-flight checks, he had telephoned Woodvale ATC to advise of his ETA and route and was told that the A/D would close in the intervening period. Inbound, 30 min before the A/D closing time, he called all published frequencies including the Air/Ground frequency used when ATC is closed and received no reply.

The Captain was aware of the 24 hour police activity at the airfield and the light ac activity during daylight. From personal knowledge he knew that the civilian flying club operates using the Air/Ground frequency when ATC is closed, hence his endeavours to contact the A/D. It would appear that this frequency was not being monitored.

We believe the Captain made every effort to inform the A/D of his intentions and that there is a possible communication problem at the A/D, particularly in consideration of the pre-flight telephone call. The selection of his low-level route is a matter outside this Airprox and will be dealt with separately.

UKAB Note (5): SATCO Woodvale confirmed that the C130 pilot had contacted the on-watch ATCO, who had granted permission for overflight of the aerodrome beforehand, though he had been advised that ATC might be closed due to the cessation of station flying before the end of their published hours. SATCO also confirmed that the unit closed at 1600. When ATC is not manned, including those periods when they have closed within their promulgated operating hours as here, the frequency in use by both private pilots and the police helicopters for the 'out of hours' procedure is 121.00 MHz – that promulgated for entry into the ATZ in the UK AIP at Note 3.

UKAB Note (6): The UK MIL Aeronautical Planning Document at Vol. 3 Part 1 Pg. 1-2-8-6 (LFA 8) promulgates a Mandatory avoidance for Woodvale A/D – MA02 – of 2nm, below 2000 ft msd.

UKAB Note (7): The LATCC (Mil) Great Dun Fell radar recording shows the Robin turning downwind for RW35 at 1636:08, as the C130 approaches the A/D from the SW indicating 100ft Mode C (1013 mb) – which equates to an altitude of about 340ft RPS (1021mb). The minimum horizontal separation at the CPA of 0.34nm is shown after the C130 had passed ahead of the

DR36 at 1636:24, as the latter clears to the E of Woodvale. As the Robin's Mode C was switched off in the Cct, the minimum vertical separation cannot be determined

MIL ATC OPS had no comment to make.

ATSI had no comment to make.

HQ STC comments that this Airprox occurred because the two ac were transmitting on different frequencies. Unfortunately, the C130 was not notified of the appropriate frequency to use. While it appears that civil aviation publications clearly identify a frequency to use as the ICF and 'after hours' frequency, military publications do not. It is suggested that military publications be amended to indicate, which of the 5 Woodvale frequencies, is the primary ICF and 'after hours' frequency.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It was apparent from the outset that there were some intrinsic regulatory issues within this Airprox, and the Board recognised it was not just a simple case of a confliction between two ac in the vicinity of an aerodrome. RAF Woodvale is a government aerodrome, staffed by civilian ATCOs, who apply Military ATC Regulations concerning its operation promulgated within JSP318A. Moreover, the Robin was a private civilian ac based at Woodvale whose pilot had to operate his ac in compliance with the ANO, unlike the C130 pilot who was bound by Military Flying Regulations within JSP318 and the UK Mil AIP.

An experienced military pilot suggested that there was little training value for the C130 crew, in selecting a transit route directly overhead an aerodrome where Police helicopters or LA could operate at any moment; the chosen track invited difficulties. Other pilot members agreed and in their view the C130 Unit's contention that the LL route selected was a matter outwith this Airprox was not right. The Board noted that for military ac flying within the UKDLFS Woodvale is afforded a mandatory avoidance of 2nm below 2000ft msd and, in accordance with the UK Mil AIP Vol 3 page

1-1-8 para 26k, should be avoided by this margin, unless exempt under the provisions of JSP318 Joint Regulations Section 3-05111. This regulation applies for military airfields in the UK which have an ATZ - but not a MATZ - and specifies that during the published hours of operation of the ATZ, military ac "...are not to enter the ATZ unless clearance to do so has been obtained from the airfield ATSU on the appropriate RT frequency, **or**, with the prior **agreement** of the ATSU obtained before take off". This regulation varies significantly with that specified for civilian pilots in the UK AIP. At the outset, the C130 pilot had contacted Woodvale to notify ATC of his intended LL transit. It was at this juncture that the C130 pilot had apparently been informed by the ATCO on watch that ATC "*might*" be closed – even though this was within the notified hours of watch of Woodvale ATC as promulgated in the UK AIP and RAF FLIPs. Considerable discussion revolved around the issue of ATC closing at the cessation of station flying, but within their notified hours of watch. The Mil ATC Ops advisor briefed the Board that JSP318A Regulation 801.105 gave no dispensation to ATSUs to close within their published operating hours without approval from the command – in this case PTC - and then only after issuing a NOTAM. For short notice closures at the end of station flying for the day it was apparent that a NOTAM would not have prevented what had occurred here. After much consideration, members concluded that the C130 pilot had obtained the "*agreement*" of ATC to his intended flight – albeit loosely but within the spirit of the regulation – but, during the pre-flight telephone call, it was unclear if the ATCO had advised the C130 pilot to call on 121.00MHz.

In view of the C130 pilot's contention that he had tried all of the frequencies promulgated in the RAF FLIP ERS – BINA, the importance of calling on 121.00MHz might not have been stressed enough which as it turned out, produced an added complication. It was explained that the period during which the Woodvale ATZ is established is derived from the hours of watch of the applicable ATSU. In this instance and in accordance with the ANO, entry into the ATZ was subject to "*permission*" being granted by ATC and a continuous watch on the notified frequency being maintained. There was a common misconception amongst some pilots that, after calling on the appropriate frequency during the notified hours of activity, if no reply was received from the ATSU,

AIRPROX REPORT No 117/02.

they could then fly through that ATZ in the belief that the aerodrome was closed and hence there was no other aerial activity. For civilian pilots regulated by the ANO it is clearly explained in the UK AIP at ENR 1-4-8 2.7.2.4, that *“failure to establish two-way radio communication with the ATC unit...during their notified hours (as promulgated within the UK AIP)...must not be taken as an indication that the ATZ is inactive... In that event except where the ac is in a state of emergency...pilots should remain clear of the ATZ”*. Rule 39 of the ANO applies to Government aerodromes and requires this 2-way communication to take place, moreover, a member opined that it was not sufficient to make an RT call on entering and leaving an ATZ - a continuous listening watch must be kept whilst in transit through the Zone. The wording used in JSP318 for military pilots is not exactly the same as the UK AIP and, somewhat misleading, suggests that entry is permitted without 2-way RT. From an airmanship perspective, in the Board's view 2-way RT contact should be a prerequisite for entry. Here, the C130 pilot had obtained 'agreement' that he could enter the ATZ beforehand – a proviso generally used for non-radio fitted ac – moreover the crew had tried to make contact on all published frequencies. It was considered that the military regulation should mirror that in the UK AIP and require the pilot to obtain permission on RT also – otherwise it did not fail safe and left room for a repeat of what had occurred here. Consequently, the Board was minded to recommend that the MOD review the existing regulations within JSP 318 Joint Regulations Section 3 - 05111 (and its subsequent MARDIT replacement) to ensure they are in accord with that promulgated within the ANO and UK AIP.

However, it was evident that the existence of the ATZ was a peripheral factor, since this incident could still have occurred after the notified hours. The C130 pilot said none of his crew heard any of the Robin pilot's numerous blind RT calls, nor the interchange with the Seneca pilot, and so remained unaware of the light ac in the Cct. There was no reason to doubt that these calls were made, but as the RT recorder was switched off in the Tower after ATC had closed this could not be verified, nor could it be verified that the C130 crew made the calls on the other published frequencies. The Board noted the C130 Unit's contention that that the C130 captain believed the

frequency used by civilian pilots flying when ATC was closed, was that of the Air/Ground Stn; investigation revealed this was incorrect – here was a salutary lesson for aircrews on making assumptions. Members were surprised that 121.00MHz had not been specified by the Woodvale controller at the outset, but it was also evident from examination of the BINA that nowhere within the Woodvale entry was it specified that 121.00MHz was used by Woodvale based civilian aviators – including the Police helicopter - after ATC had closed. As 121.00MHz was the frequency notified in the UK AIP for the purpose of obtaining entry into the ATZ, it seemed to members that this should be highlighted in some way to military pilots who utilise RAF FLIPs. Many units have gliding clubs and private flying regularly takes place at government aerodromes outside the ATSU's hours. Therefore, the Board was minded to recommend that the MOD defines more clearly within RAF FLIPs, the RT frequencies used at UK civil and military airfields, during activities which occur outside of the applicable ATSU's hours of watch, for the benefit of military pilots.

Turning to the Robin pilot, it was explained that he had not notified Woodvale ATC of his return flight from Sywell beforehand – he said that as his ac was based at Woodvale he was not bound by the PPR caveat and had used the 'out of hours' procedure instead. Members speculated that if he had notified his return flight to ATC he might have been told about the planned C130 transit and that the aerodrome was closing early. However, the use of the 'out of hours procedure' whilst appropriate outside notified hours – here after 1700UTC - did not overrule the requirements of the ANO. The Board understood that the Robin pilot had adopted this procedure with care and with the best of intentions, having returned to Woodvale with evident concern for other airspace users, making appropriate and frequent blind RT calls that the C130 pilot should have heard. However, in complying with this 'out of hours' procedure whilst the ATZ was still active, i.e. within 'notified' hours, technically the Robin pilot had operated in contravention of Rule 39, which required him to remain clear of the ATZ if no response was received from ATC.

Attention then focused on the final moments of the Airprox. It was evident that the Robin pilot had not seen the C130 before the latter had flown some

400ft beneath his ac, despite having the opportunity to spot it in the reported visibility below cloud. Members were conscious that he would have been focusing his attention on the runway to his left whilst establishing himself downwind in the LHD Cct and looking away from the direction of the approaching C130, below him. Hence, the C130 passed unseen until it emerged from under the port wing, which in the Board's view was effectively a non-sighting and part of the cause. Conversely, the C130 crew with many more eyes to look out and spot the Robin were oblivious to the presence of the small ac in the Cct above them whilst they overflew the aerodrome – again a non sighting on their part and the other part of the cause.

A common denominator here was the absence of ATC whilst the ATZ was active. Whilst in the end it was both pilots' responsibility to see and avoid each other's ac in this VFR environment, the consensus of opinion was that if ATC had been open to provide a service within their notified hours of operation then this Airprox would not have occurred. Consequently, there was unanimous agreement that the absence of ATC during their notified hours had removed a safety net and this had been a contributory factor here. Notwithstanding the wording of the regulation within JSP318 and excepting what happens in the absence of an ATC service when an AFIS or A/G Station is established, the principle airmanship lesson here was as follows: if an ATZ is active and no permission to enter can be obtained from the ATC unit on RT then pilots should remain clear.

When assessing the risk, it was evident that the C130 crew had been unaware of the presence of the light ac as they passed about 400ft beneath and ahead of it. For his part the Robin pilot only saw the heavy transport ac effectively after the

Airprox had occurred. There was no reason to doubt the veracity of the Robin pilot's report, but the vertical separation could not be verified without Mode C data. In the Board's opinion, neither Robin pilot nor C130 crew was able to effect the outcome of this encounter and any vertical separation that existed between the two ac was purely fortuitous. Whereas the Board concluded that the reported 400ft vertical separation had mitigated the actual risk of collision, members agreed unanimously that the safety of the ac involved had been compromised in the circumstances described here.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A non-sighting by the C130 Hercules crew and effectively, a non-sighting by the Robin DR36 pilot.

Degree of Risk: B.

Contributory factor: ATC was unmanned during their notified hours.

Recommendations:

- a. That the MOD review the existing regulations within JSP 318 Joint Regulations Section 3 - 05111 (and its subsequent replacement) to ensure they are in accord with that promulgated within the ANO and UK AIP.
- b. That the MOD defines more clearly within RAF FLIPs, the RT frequencies used at UK civil and military airfields by participants of activities which occur outside of the applicable ATSU's hours of watch.

AIRPROX REPORT No 118/02.

AIRPROX REPORT NO 118/02

Date/Time: 12 Jul 1307

Position: 5232N 0123W (1nm W SAPCO)

Airspace: CTA (Class: A)

Reporting Aircraft Reported Aircraft

Type: B767 FK10

Operator: CAT CAT

Alt/FL: FL90 FL90↑

Weather VMC CLAC VMC CLOC

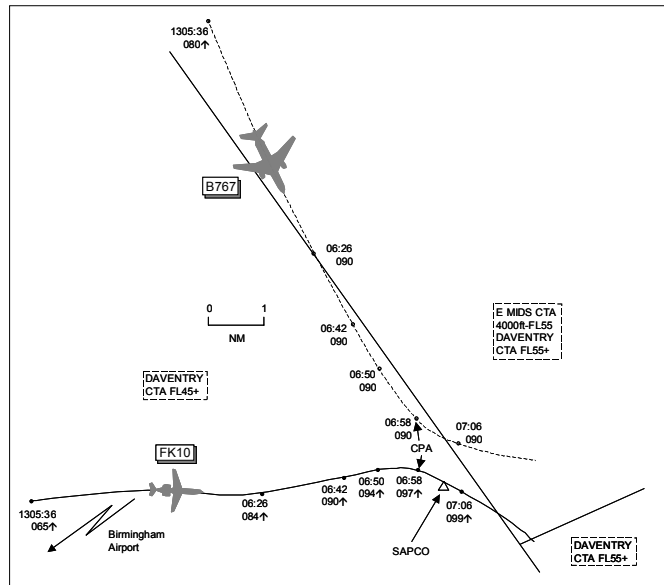
Visibility: 20km 40km

Reported Separation:

300ft V 1.5nm H NR

Recorded Separation:

700ft V 0.9nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE B767 PILOT reports following a DTY 2N SID outbound from East Midlands heading 165° at 310kt and FL90 and in receipt of a RCS from LONDON on 130.92MHz. The visibility was 20km 1000ft above cloud in VMC and he was squawking 0577 with Mode C. When passing position DTY 341R 28D, he received a TCAS TA on traffic 2 o'clock range 4nm 500ft below and climbing. Although looking into sun, he immediately visually acquired a Fokker jet, which was in shadow, in that position. Approx 2 sec later, he heard LONDON tell the FK10 to turn R heading 160° which was followed by an instruction "B767 c/s avoiding action turn L heading 110°". He, the Capt and PF, disengaged the A/P and turned L immediately using 30° AOB. The Fokker was seen, in a RH climbing turn, to pass 300 ft above him at a range of 1.5nm. Traffic was so busy since he had transferred to the London frequency, that he had to wait for 5 calls to/from other ac on the RT to finish before being able to make his initial call to ATC. He assessed the risk of collision as medium.

THE FK10 PILOT reports flying outbound from Birmingham on a radar heading at 270kt and level at FL90, he thought, and in receipt of an ATC service from LONDON. ATC told him to turn R and was then heard to issue the subject B767 ac

with a L turn. Meanwhile he had received a TCAS TA alert and saw the B767 in his 9 o'clock range 3nm at the same level, he thought it was climbing, and eventually it crossed behind him. He assessed the risk of collision as medium.

ATSI reports that the TC SC concerned took over the Welin Sector seven min before the incident occurred. He said that his workload was high as, not only was the traffic situation complex, but also he had been busy rearranging his fps display, following the handover, to accommodate his method of operation.

The controller said that when he took over the Welin Sector the fps were displayed in only one bay. He explained that his method of operation was always to utilise two bays. This, he commented, reflected the information shown in the LTCC MATS Part 2, Page MID 1.5, where it describes the active flight progress board display as carrying two designators i.e. WELIN/BEDFO. Consequently, following the handover, he was busy changing from a single to a double bay fps display.

The FK10 established communication with the Welin Sector at 1303, i.e. just after the SC took over the position. The pilot reported climbing to

FL60, on a Daventry (DTY) departure. The ac was outbound from Birmingham, enroute to Amsterdam, following a DTY 4D SID from RW 33 i.e. "climb straight ahead to I-BM D2 or 500ft QFE whichever is later, then turn R to intercept DTY VOR R319 by DTY D26 then continue to DTY VOR". The FK10 was placed on radar heading of 090°. The SC said that it was usual practice to take ac, routeing via Clacton, off the SID to the E, to facilitate the cross over with traffic northbound in the sector. On this occasion, the heading also provided separation from an ac southbound at FL70, passing E of Birmingham, routeing to DTY. To ensure that the FK10 remained within Controlled Airspace (CAS), on its easterly heading, at 1304:26, the SC cleared the flight to climb to FL170. (The base of CAS to the E of Birmingham is variously FL75/FL105.) The radar timed at 1304:22, shows the FK10, on an easterly track, passing FL48. 16.8nm to the NE of this ac is the B767, outbound from East Midlands. This flight is passing FL50, turning S, onto a conflicting track with the FK10. The controller said that he had overlooked the presence of the B767, not yet on his frequency, which would have been climbing towards DTY, in accordance with the Standing Agreement, between the MACC Trent Sector and TC Midlands, to FL90. Consequently, he was not aware of the potential confliction between the subject ac.

The SC explained that there would have been an fps available on the sector for the B767. However, because he was in the process of incorporating fps into his display, following the handover, this fps was still above the designator, not having been placed in the active bay. Consequently, the confliction did not register whilst looking at the fps board. (The LTCC MATS Part 2, Page GEN 9.4, states that TC Sector Radar Controllers are responsible for maintaining 'an up-to-date flight progress display'.) However, he was surprised that he had not observed the B767 tracking S from East Midlands, towards the FK10, whilst scanning his radar display.

The B767 had been transferred from East Midlands ATC to MACC, because of the previously mentioned southbound traffic at FL70. The LTCC MATS Part 2 (MID 2.12) states that "Should there be conflicting traffic such as overflying traffic, traffic inbound to East Midlands, or northbound departures from Birmingham RW

15, MACC MUST take control of the East Midlands departure and effect separation". Once clear of this traffic the B767 was transferred to the Welin Sector. The Welin SC said that he observed the B767 on his radar display just before it called him. This was about two minutes after he had cleared the FK10 to climb to FL170. The SC's immediate reaction was to pass a turn to the FK10 but he was prevented from carrying out this plan because another ac was transmitting at the time. He then did not respond to the B767's initial call at FL90 but instructed the FK10 to turn right heading 160°. The radar, timed at 1306:26, reveals that the two ac were 4.4nm apart when this instruction was passed. The B767 was maintaining FL90, with the FK10, passing FL84, in its one thirty position. Having received an acknowledgement of the heading instruction from the pilot of the FK10, he transmitted to the B767 "*avoiding action turn left onto a heading of one one zero*". The pilot responded that he was visual with the traffic. The SC said that STCA did activate during the encounter, going straight to a high severity alert, but he was already taking remedial action by then.

[UKAB Note: The Clee Hill radar recordings of the event reveal that the two flights continued to close laterally, as vertical separation increased. This was after the FK10 had climbed through the level of the B767, at 1306:42, when they were 2.8nm apart. The minimum separation was recorded (1306:50) as 1.8nm/400ft. The CPA, laterally, occurred at 1306:58, when the two ac had closed to 0.9nm, by which time the vertical separation had increased to 700ft]. Horizontal separation required was 5nm.

It would appear, from enquiries made at LTCC, that numerous Midlands Group SCs use a single, rather than a double bay fps display. Although the LTCC MATS Part 2, Midlands/Welin Sector, shows that the active fps board displays two designators for WELIN and BEDFO and illustrates them in two bays, it does not stipulate that two bays have to be used. To address this matter, the Head of ATC Investigation, LTCC, made the recommendation that "DGM TC consider if the layout of the flight progress strip displays for TC enroute sectors as shown in MATS Pt 2 should be mandatory". The DGM TC has accepted this recommendation and it is understood that the matter is now under discussion.

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.

ATCOs were not surprised that the Welin SC had been preoccupied rearranging his fpss post handover as his normal 'modus operandi' was in accordance with the MATS Pt 2 utilising a double bay fps display, not the single bay situation that was in place at the handover. Although Members were aware of the increased workload that this entailed, the oncoming SC had agreed to take over the sector and was responsible for maintaining an up to date fps display. The act of carrying out this task after taking over the busy sector had been a contributory factor to the Airprox. Moreover, the SC had not incorporated the B767 fps into the active bay and therefore he did not take that ac into account when he issued climb clearance to the FK10. This had caused the Airprox.

The NATS advisor confirmed that LTCC had since issued an OPNOT (84/02) to highlight this incident and had reminded ATCOs of the correct 'standard' layout of the Flight Progress Board on the TC COWLY Sector which should be used. Also a Supplementary Instruction (SI 87/02) was issued reiterating that during a handover ATCOs are to ensure that the fps display is tidy, accurate and representative of the traffic situation. Members felt that a standard layout of displayed data was essential as it would be 'familiar' to all

controllers which was particularly important during handover or when splitting a sector.

The SC had climbed the FK10 to FL170 and saw the confliction on radar about 2 min later just before the B767 pilot made his initial call on frequency. Although he was unable to resolve the situation immediately, owing to an ac transmission, he had quickly turned the FK10 R followed by giving an avoiding action L turn to the B767. STCA had activated after he had commenced taking action. Meanwhile, the B767 crew had received a TCAS TA alert which had enabled them visually to acquire the climbing FK10 4nm away and below. After ATC was heard giving the FK10 a R turn, the B767 crew received an avoiding action L turn which was promptly executed whilst the FO watched the Fokker pass 1.5nm clear above and to his R. Similarly, the FK10 crew had executed a R turn when instructed as well as receiving a TA alert; they visually acquired the B767 as they climbed through its level range 3nm and saw it pass clear behind. All of these elements combined led the Board to conclude that any risk of collision had been effectively removed.

PART C: ASSESSMENT OF CAUSE AND RISK

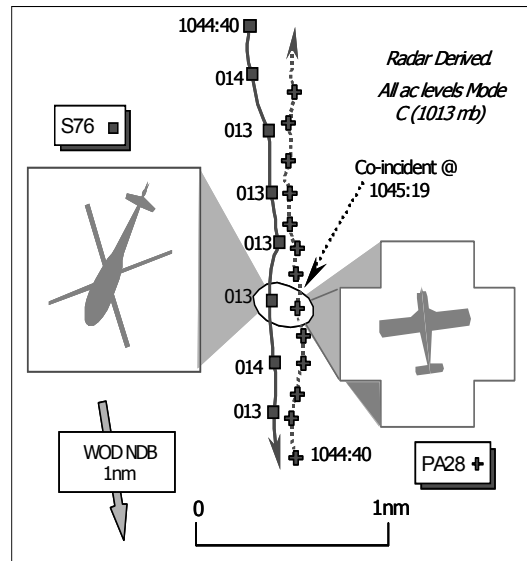
Cause: The WELIN SC did not take the B767 into account when he issued climb clearance to the FK10 crew.

Degree of Risk: C

Contributory Factor: The WELIN SC was engaged in rearranging the fpss from a single to a double bay display.

AIRPROX REPORT NO 119/02

Date/Time: 16 Jul 1046
Position: 5130N 0054W (2nm N WOD NDB)
Airspace: FIR (Class: G)
Reporting Aircraft Reported Aircraft
Type: Sikorsky S76 PA28
Operator: Civ Pte Civ Pte
Alt/FL: 1600ft 1800ft
 (QNH 1021mb) (QNH 1021mb)
Weather VMC CLBC VMC CLBC
Visibility: 6-8km 6nm
Reported Separation:
 300yd H, Nil V 0.5nm H, 400ft V
Recorded Separation:
 0.25nm H, NR V

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

THE S76 PILOT reports that he was inbound to Blackbushe aerodrome [4nm NW Farnborough], flying on a southerly heading at 1600ft and 145kt. His helicopter was maroon coloured, with HISLs, landing lamps, transponder and TCAS all on. The visibility was about 6-8km in haze, and the pilot was in contact with Farnborough RADAR who were providing a FIS. A RIS had been requested but this was not available. The other ac, identified as a low wing, white/red single engined monoplane, was first sighted at about 0.25nm, apparently in a level cruise. A hard turn to the R was made, whilst the other ac appeared to take no evasive action. Although TCAS was fitted, no indication was received until after avoiding action was initiated, at which point a TA was triggered, with associated "TRAFFIC" aural alert. Separation was assessed as 300yd horizontally and nil vertically. Risk was assessed as "high" and the pilot estimated that the two ac would have passed within 100yd had avoiding action not been taken. The Airprox was reported by RT to Farnborough.

THE PA28 PILOT reports heading 353° at 1800ft and 100kt outbound from Blackbushe. He was maintaining 200ft below cloud in hazy conditions, with visibility about 6nm. His ac was red/white and strobes were on. Transponder with Mode C was fitted and switched on; TCAS was not fitted.

The pilot was receiving a RIS from Farnborough RADAR, but was not advised by them of the helicopter, which was sighted visually at a range of about 0.5nm, and was seen to pass 0.5nm down the port side, about 400ft below. No avoiding action was taken, and the risk was assessed as "low". In his report, the pilot questioned why the other ac [UKAB Note (1); he believed it was military] would fly into such a busy area without radar cover. The pilot observed that there was intense radio traffic and aerial activity in the area, and stated that this was "a major consideration in not reporting the Airprox at that time".

UKAB Note (2): The PA28 pilot did not subsequently file an Airprox report until requested to do so by the tracing authority.

ATSI reports that both ac were operating VFR in Class G airspace in the London FIR. At the time of the incident, the S76 and the PA28 were both in receipt of a FIS from the Farnborough LARS controller.

In the period leading up to the incident the LARS controller was experiencing a high workload, generated by VFR traffic, as well as the associated co-ordination required with the Farnborough APR and ADC. The LARS controller

AIRPROX REPORT No 119/02.

was also regulating the entry of traffic into Temporary Restricted Airspace (TRA), which had been promulgated around Farnborough for the duration of the Farnborough International Airshow. At various times during the morning high performance ac from the Airshow were validating their display sequences within the TRA, and each of these flights required co-ordination, which added to the LARS controller's workload.

At 1040, the PA28 established communications with the LARS controller, reporting airborne from Blackbushe, stating *"currently at 1200 feet on QNH 1022mb"*. The controller advised the flight that it was co-ordinated into the TRA, placed it under a FIS, provided the Farnborough QNH 1021mb and issued a discreet SSR code. This was correctly acknowledged by the pilot. (Note: The MATS Part 1, Section 1, Chapter 1, para 5, FIS, states that *"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"*.) The radar recording shows the PA28 tracking N from Blackbushe towards the WOD NDB, displaying the assigned code, but without Mode C height readout.

Just over 3 min later, the S76, which was inbound to Blackbushe from the N, made its first call on the LARS frequency. The pilot reported 15nm N of Blackbushe, descending to 1500ft, VFR and requesting a RIS. The flight was issued the current QNH, 1021mb, advised that only a FIS could be provided *"initially"* and assigned an SSR code. This was correctly readback by the pilot. By this time, the radar recording shows that the PA28 had just passed WOD, still tracking N, while the S76 was on a reciprocal track, at a range of about 6nm, descending through 1900ft, SSR Mode C. Thus the two flights were in potential conflict, but as this was not recognised by the LARS controller, neither ac was informed about the presence of the other. Two min later they were about 1nm apart, in each other's 11·30 position, with the S76's Mode C showing 1500ft. The next radar sweep indicates the helicopter had climbed 100ft to 1600ft, which it maintained as it passed less than 0·25nm to the W of the other ac. No comment was made at the time by the pilot of either flight. A short time later, the PA28 pilot requested transfer to Benson, which was

approved by the controller and the flight instructed to select SSR code 7000. The S76 pilot was subsequently instructed to hold to the N of Blackbushe as an F16 was about to commence a display at Farnborough. The flight was then transferred to the Farnborough APR frequency where the pilot then declared (some 6 min after the event) that he wished to report an Airprox which had occurred *"...two miles north of Woodley we were one thousand six hundred feet one zero two one southbound for Blackbushe PA28 passed less than half a mile to the east of our aircraft same level"*. The details were acknowledged by the APR who subsequently transferred the flight to Blackbushe.

The MATS Part 1, in addition to the above, states that when providing a FIS *"...controllers will, subject to workload, provide pilots with information concerning collision hazards to aircraft operating in Class C, D, E, F or G airspace when self evident information from any source indicates that a risk of collision may exist. It is accepted that this information may be incomplete and the controller cannot assume responsibility for its issuance at all times or for its accuracy"*. It would appear on this occasion that the level of workload experienced by the LARS controller was sufficient to prevent her from identifying the potential conflict between the subject flights and issuing appropriate traffic information. Clearly the additional responsibilities associated with the Airshow were a factor in the LARS controller's workload. This has been recognised by the Unit who have agreed to explore different ways of managing the workload of the LARS controller during future Airshows.

UKAB Note (3): The PA28 pilot reported on RT that he was at 1200ft. In his Airprox report he stated that he was at 1800ft, which appears to be the more likely, given the pilots' descriptions of the Airprox.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It was clear that this had been a routine encounter in Class G airspace where the 'see and avoid' principle pertained. Both pilots were receiving a FIS from ATC, although the PA28 pilot erroneously thought a RIS was being provided, with each responsible for maintaining their own separation from other traffic. Looking at the geometry of the encounter, the S76 was flying into sun in hazy weather conditions, making visual acquisition more difficult than from the PA28's cockpit which was pointing down-sun. Unfortunately, the high workload experienced by Farnborough LARS controller had apparently contributed to her not recognising the potential conflict and providing collision hazard information to both crews. Without the 'safety nets' of TI from ATC or TCAS alerts, detection of the conflict rested solely with the respective pilot's lookout and subsequent actions with equal onus. Members agreed that the subject ac had flown into conflict in the FIR which had been recognised then resolved by the actions of the S76 pilot.

The S76 pilot saw the PA28 at range 0.25nm and had executed a R turn to avoid. TCAS gave a TA alert after the turn was started and the pilot watched the PA28 pass 300yd abeam on his LHS at the same level. This level of TCAS alert probably resulted because either the PA28 was not squawking Mode C or the type of TCAS equipment fitted to the helicopter. For his part, the PA28 pilot saw the helicopter 0.5nm away but took no action as he watched it pass clear on his LHS and below. The recorded radar had shown the subject ac passing 0.25nm apart. These elements combined persuaded the Board that both pilots had seen one another in reasonable time but it was the positive action taken by the S76 pilot that had removed any risk of collision.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in the FIR resolved by the S76 pilot.

Degree of Risk: C

AIRPROX REPORT No 121/02.

AIRPROX REPORT NO 121/02

Date/Time: 11 Jul 1425

Position: 5159N 00147E (11.5 NM WSW GABAD)

Airspace: AWY L620 (Class: A)

Reporting Aircraft Reported Aircraft

Type: ATR72 BALLOON

Operator: CAT NK

Alt/FL: FL210 FL210

Weather VMC CAVOK NK

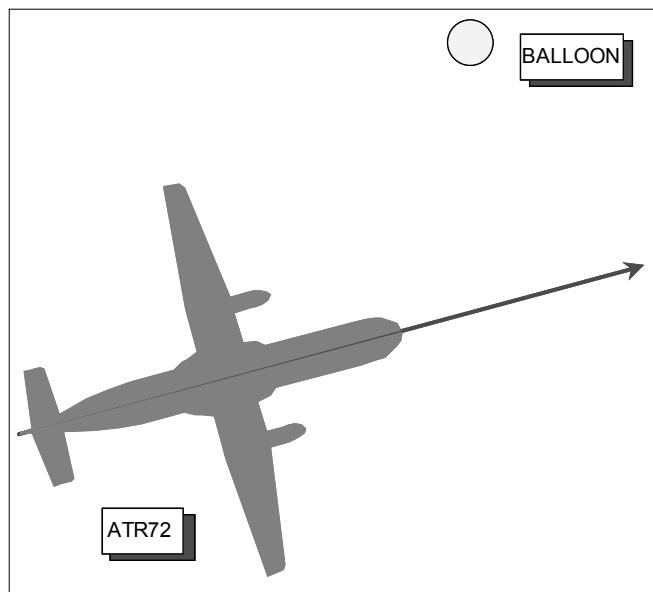
Visibility: >10KM NK

Reported Separation:

NIL V, NK H NK

Recorded Separation:

NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE ATR72 PILOT reports that he was en route from London Gatwick to Bremen in level cruise at FL210 and in contact with London Control on 133.45MHz. About 20nm before REFSSO, he thought, when heading 075° at 200kt, a yellowish balloon-shaped object passed close to the LH side of the ac. It appeared to have a box-shaped appendage. Although he was unable to estimate the horizontal distance, he thought it close because of the closure rate. No avoiding action could be taken as it was only 2 sec between first spotting the balloon and its passing abeam. However, he reported the incident to London Control and, subsequently, also to Amsterdam. He assessed the risk as medium had the balloon hit his ac.

THE MET OFFICE SENIOR AIRPORT MET ADVISER reports that at the time of the reported incident the synoptic situation showed a weak area of low pressure centred to the N of Scotland and Denmark, with a slack WSW flow over the North Sea. An estimation of the likely launch location can be established by consideration of the rate of ascent and wind flow over the North Sea at the time. Under normal circumstances it would take a weather balloon approximately 20

min to reach an altitude of FL210, so the met balloon would have been launched at about 1410. The approximate wind flow from 1000ft to 24000ft was as follows: FL010 240/20kt, FL020 240/20kt, FL050 240/20kt, FL100 250/20kt, FL180 240/25kt and FL240 260/50kt. These winds would suggest a point of origin about 10 to 15nm WSW of the incident. The closest site from which the Met Office regularly launches weather balloons is Shoeburyness, but this is more than 40nm to the SW. Any launch, therefore, could only have been from a ship or rig operating in the North Sea close to the location of the reported incident; the Met Office uses neither for launching weather balloons. Although the most likely source of the weather balloon is a ship or oil platform, there is no reasonable means of checking this.

THE DAP UK MET AUTHORITY reports that Shoeburyness launched a weather balloon at 0745. This attained a maximum altitude of 9574m, after around 30 min, before the balloon burst and returned to the surface.

UKAB Note (1): Analysis of the Debden radar recorded data is inconclusive. The ATR72 is shown tracking towards REDFA squawking 0516

with Mode C level at FL210. At 1425:46, when the ac is 11.5nm WSW of GABAD, a primary target appears at 9 o'clock range 0-3nm. This subsequently fades and does not reappear. No further primary returns appear in the vicinity of the ATR72.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included a report from the ATR72 pilot, radar video recording and reports from the Met Office.

Members acknowledged the ATR72 pilot's risk assessment but emphasised that risk determined by the Board relates to collision/safety and not to damage after collision. In attempting to correlate the pilot's report with available recorded radar data, members noted that no avoiding action was taken. This could have been due to late sighting

or, possibly, mistaken impression of proximity. Whatever, with no other inputs available members had insufficient information to determine risk of collision.

The Board also noted, with concern, that yet again the release point and releasing authority remain untraced. Similar circumstances were experienced in Airprox 97/02 from which a recommendation was made to the CAA and MOD to review arrangements on balloon releases and the risk to other airspace users. A response to this recommendation was still awaited.

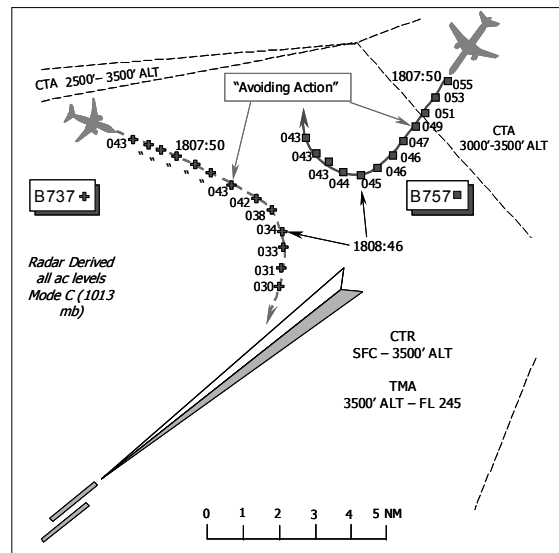
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict with an untraced balloon in Class A airspace.

Degree of Risk: D

AIRPROX REPORT NO 122/02

Date/Time: 17 Jul 1808
Position: 5326 N 0200 W (10nm NE Manchester - Elev 257 ft)
Airspace: Manchester TMA (Class: A)
Reporting Aircraft Reported Aircraft
Type: B757 B737
Operator: CAT CAT
Alt/FL: 4500ft ↓ 500ft
 (QNH 1022 mb) (QNH 1022 mb)
Weather VMC CLBL VMC CLBL
Visibility: 60 km NR
Reported Separation:
 2 NM H, 300ft V NR
Recorded Separation:
 2.8 NM H, 1100ft V



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE B757 PILOT reports that he was inbound to Manchester and was being vectored by FIN DIR (121.35) towards the ILS for RW24R at altitude

4500 ft cleared he thought, to 3000ft [actually 4000ft]. The ac was flying in "poor VMC" at a speed of 180 kt and was partially configured for

AIRPROX REPORT No 122/02.

the approach, with initial stages of flap extended. The autoflight and autothrottle systems were engaged. Whilst heading 270°, he thought [actually 220°], on final vectors, FIN DIR ordered an avoiding action right turn onto North. During this turn a “momentary” TCAS RA triggered, at which point the crew had the conflicting B737 in sight. The TCAS RA was not followed, the separation was assessed using TCAS as 2 NM horizontally and 300’ vertically. The turn to North was continued to an orbit and the ac then established on the ILS. The pilot described the TCAS RA as “useful” and assessed the risk as “high”.

THE B737 PILOT reports that he was inbound to Manchester and was being vectored by FIN DIR towards the ILS for RW24R at altitude 4500ft. The pilot became aware that an expected turn to intercept the ILS was not forthcoming and checked the selected VHF frequency. It was found to be selected to TWR frequency (118.625), though no instruction to change frequencies had been received. He immediately re-established comms with, he thought, FIN DIR and was given an avoiding action descent and heading of 180°. At about the same time he received a TCAS TA, and although he reports being in VMC, he states that he was in between cloud layers and did not see the conflicting traffic. No assessment of separation or risk level was submitted. The pilot continued with the approach and after landing contacted the ATC Watch Supervisor. He was advised that separation had not been lost but that an MOR would be filed, and he subsequently submitted his own report after landing at his home base. The pilot offered an explanation for events, stating that he was training an inexperienced co-pilot who, in an effort to “keep ahead of things” had selected the TWR frequency on the standby position so that it would be ready when instructed. Unfortunately, the co-pilot had then inadvertently selected this frequency for use without being consciously aware of it.

UKAB Note (1): The B737 crew called on TWR with request for further descent. TWR instructed them to call 121.35 (FIN DIR) but the crew actually switched back to 119.4 (APP) who they had been working with prior to FIN DIR. It was APP who issued the avoiding actions at the same time as FIN DIR issued avoiding action to the B757.

UKAB Note (2): The radio equipment in the type of ac involved here allows for two frequencies to be selected, one is “active” and the other is “stand-by”. Switching between the two is achieved by a single switch located adjacent to the frequency displays. It is common practice among airline crews to “set-up” the next frequency if it is known, to reduce delay when instructed to change.

ATSI reports that the B737 crew made an unauthorised frequency change. The problem only became apparent when the B737 did not respond to a further clearance to 3000ft; by that stage both ac were on conflicting tracks and descending to 4000ft. It may have been prudent to have issued descent to the B737 before clearing the B757 to the same altitude but this is common practice whilst vectoring ac to final approach. Additionally FIN DIR had to wait until the B737 was within the CTA/CTR before descending it below 4000ft at which point the two ac were about 9.5nm apart. The FIN DIR tried twice more to contact the B737 and in between instructed the B757 to reduce speed to 180 kt. An avoiding action turn was passed to the B757 when the ac were 6.9nm apart, with 1000ft separation. The B757 pilot asked if he should maintain height, and FIN DIR replied, somewhat ambiguously, “*er no, just maintain the height if you give it a good rate of turn... he’s er four miles ahead of you now passing right to left*”. The B737 called on TWR at 1807:50, and then again on APP frequency, though it had previously been transferred to, and had been in contact with, FIN DIR. APP issued avoiding action to the B737, a turn to 180° and immediate descent to 3000ft. The two ac closed to 2.8nm but by this time vertical separation had increase to 1100ft and both ac were by this time in their right turns. The action taken prevented separation reducing below the requisite 3nm / 1000 ft.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available to the UKAB 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 incident arose when the B737 crew inadvertently changed frequency, and remained unaware of the fact until alerted to it by the tower controller. The Board thought that the incident had been very well handled by the Manchester control team, and praised their co-ordinated prompt response that ensured separation was maintained. Moreover, the B757 pilot had also acted commendably. It was noted that the receipt of a TCAS RA did not automatically mean that separation had been lost, as this incident had illustrated. All of the safety nets had worked well

to the extent that those involved had rendered safe a situation that might otherwise have had an unsafe outcome.

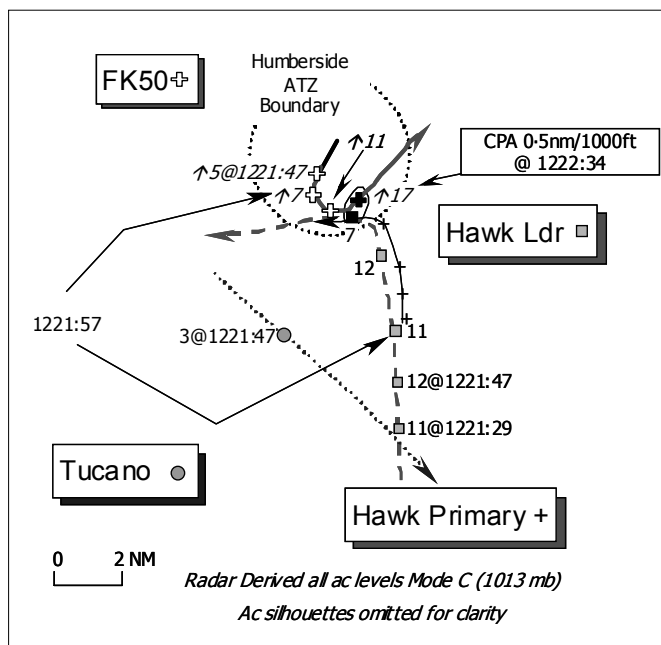
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Sighting report.

Degree of Risk: C

AIRPROX REPORT NO 123/02

Date/Time: 19 Jul 1222
Position: 5332 N 0020 W (2nm SSE of Humberside)
Airspace: Humberside ATZ (Class: G)
Reporting Aircraft Reported Aircraft
Type: FK 50 Hawk
Operator: CAT HQ PTC
Alt/FL: 800ft 1000ft
 (QNH 1018mb) (RPS 1015mb)
Weather VMC CLBC VMC CLOC
Visibility: 10km >10km
Reported Separation:
 5-600ft V, 800 - 1000ft
 <1/4nmH
Recorded Separation:
 1/2nm H, 1000ftV [Hawk Ldr A7003]



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE FK50 PILOT, the pilot-in-command and the PF, provided a very comprehensive report stating that Humberside TOWER cleared him for take-off from RW21 followed by a L turnout on track to the OTTRINGHAM (OTR) VOR. After take-off, passing 500ft aal at 140 kt, he had commenced the L turn, when TOWER advised that a Hawk formation would be transiting E – W and that he should switch now to RADAR on 119.12MHz. At this point no traffic information or heading to steer

to avoid a conflict had been given, he thought. Whilst passing 800ft - still in the L turn - TCAS started to give constant "TRAFFIC, TRAFFIC" alerts. The F/O - the PNF - started to scan for the Hawk formation to try and acquire it visually. They perceived from the TCAS that the other ac – there was only 1 contact displayed on TCAS - was at their level heading straight towards them. Turning outbound for the OTR, as he climbed through 1000ft agl and called RADAR, they still had a

AIRPROX REPORT No 123/02.

TCAS TA on traffic indicating about 13-1400ft agl when he heard the Hawk formation leader call 'visual' with his FK50 on the frequency. No calls were heard from RADAR up to this point, but 5-10 seconds later the F/O saw the formation of Hawks, which had by then split into 2 groups. The jet displayed on TCAS was part of the group that flew 5-600ft underneath and less than ¼nm astern of his ac, as the second group of jets broke away onto a southerly heading and climbed, passing 1000-1500ft above his ac about ½nm away. Only the F/O actually saw any of the jets as the formation was on his blind side and it happened so fast. No TCAS RA was enunciated at the time, as this mode was suppressed due to their height.

He expressed concern that the Hawk formation leader had changed direction and headed into the active circuit at Humberside with departing CAT. He wondered why they were not held on the ground if the expected course of the Hawk formation was going to conflict with their departure. He opined that TCAS traffic alerts are problematic when RAs are suppressed, as you have to try and work out what risk of conflict exists yourself, military pilots seem to have no idea about the problems they cause commercial traffic fitted with TCAS as too high closure rates cause TA and RA alerts. He assessed the risk as "low".

THE HAWK PILOT reports he was leading a formation of 9 Hawk ac on pre-planned transit to a display at RAF Cranwell, heading 350° at 360 kt. The lead ac was squawking A7003 with Mode C. One pilot in the formation was in communication with Waddington APPROACH (APP) who were providing a RIS and another with Humberside, he thought TOWER [UKAB Note (1) it was actually RADAR]. Fully aware of the departing FK50 as a result of the traffic information supplied by APP and RADAR, he acquired the FK50 visually at about 6-7nm range. Unfortunately, he flew closer than intended to this ac as a result of being unable to carry out a planned navigational turn owing to unseen low level traffic reported by APP out to the west [the Tucano]. Additionally, he was told to pull up to avoid the conflicting FK50 by one of his formation pilots, but despite this he easily avoided the FK50 by easing down and turning left, passing 800-1000ft below and about 1nm astern of the other ac. He assessed the risk as "nil".

[UKAB Note 2: The "unseen low-level traffic" referred to here was a low-level Tucano also at

some stage in contact with Humberside RADAR and shown on the radar recording squawking A7001 indicating 3-600ft Mode C.]

THE HUMBERSIDE AERODROME CONTROLLER (TOWER) reports that as the FK50 departed off RW21 the Approach Radar Controller (RADAR) called on the landline and passed traffic information on the Hawk formation 4nm to the S of the airport routeing E - W. He passed this to the FK50 crew when the ac was passing about 300ft in the climbout. The FK50 crew replied "looking out" and the ac was seen to make a tight L turn, so he instructed them to call RADAR on 119.12MHz so that further traffic information could be passed.

Looking to the SE of the airport, he then saw the Hawk formation which appeared to descend and pass below and to the south of the FK50 inside the ATZ, according to the Aerodrome Traffic Monitor.

UKAB Note (3): The UK AIP at AD 2-EGNJ -1-6, promulgates Humberside Airport ATZ as a circle radius 2½nm, centred on RW03/21, from the surface to 2000 ft above the aerodrome elevation of 231 ft and active on Fridays in Summer from 0530-1900UTC.

THE HUMBERSIDE APPROACH RADAR CONTROLLER (RADAR) reports that he received a free-call from the Hawk formation leader on 119.12MHz, advising that they intended to route 4nm S of Humberside at 1000ft. He passed traffic information to the Hawk formation leader about the departing FK50, which had been released off RW21 - IFR, turning L for OTTRINGHAM and climbing through the formation's altitude. Waddington then called about the Hawks, whereupon he advised that he was already in RT contact with them. As he could see the FK50 moving, he called TOWER and gave her traffic information about the Hawk formation - to pass E - W 4nm S of the airport at 1000 ft, which he heard TOWER pass on immediately, followed by an instruction for the FK50 crew to call RADAR early.

As the Hawk formation approached Humberside, it appeared to climb to 1400ft Mode C so he continually passed traffic information on the FK50 to the formation leader until the latter reported visual contact with the FK50; it was about this time

that the formation appeared to split into two sections.

The FK50 crew did not make contact on 119.12MHz, until after the Hawk formation had passed below the FK50. He queried if the crew had been visual with the Hawks as they passed underneath, and he replied "yes", but there was nothing in the tone of his voice to indicate that the pilot was concerned. He was subsequently advised when off-watch that the FK50 pilot had filed an Airprox.

UKAB Note (4): The 1220 Humberside weather was reported as: Surface wind: 220/5kts; Visibility: 10km or more; Cloud: Scattered 2500 ft; Tem +21/+14; QNH: 1018mb.

ATSI reports that the FK50 was outbound from Humberside to Amsterdam on an IFR FPL. At 1218:30, TOWER issued a departure clearance that required the FK50 crew "... to...join controlled airspace on track OTTRINGHAM (OTR VOR) in the climb FL130...". At 1219:30, the Hawk formation leader, free-called Humberside RADAR. The lead pilot reported they were "...a formation of nine aircraft at 1000 feet we're routeing south of your zone by 4 miles in 3 minutes do you have any traffic to affect". RADAR immediately responded by advising "...Fokker 50 about to depart runway 21 will be turning left climbing IFR to Ottringham", however, the formation was neither issued the Humberside QNH nor the leader informed of the level to which the FK50 was climbing. The Hawk formation leader did not request a specific service and none was offered by RADAR, however, in his report the controller records that he was providing a FIS. As soon as the Hawk pilot had acknowledged the traffic information, RADAR received a telephone call from the Waddington SUPERVISOR (SUP) reporting "...traffic information north-east of Scampton 5 miles tracking 060...[Hawk formation C/S]". This is confirmed by the radar recording which shows the Hawk formation as one contact - with their allocated SSR code - about 10nm S of Humberside, tracking ENE and indicating 1000ft Mode C (1013mb) - an altitude of about 1150ft QNH (1018mb). Just before 1220:00, RADAR said that he was already in RT communication with the formation and the call ended. About 15 sec later RADAR notified TOWER that there was "Traffic for the Fokker 50 [Hawk formation C/S] to pass east to west 4 miles south". By this time, the

FK50 crew had been cleared for take-off with a L turn-out and was just airborne. Just after 1221:00, TOWER advised the FK50 crew "...traffic [Hawk formation C/S] passing east to west 4 miles south" to which the pilot replied "we're looking". At 1221:29, the radar recording shows the Hawk formation about 9nm SSE of the airport at 1100ft (1013mb), having just completed a L turn onto 350°. The Hawk formation leader requested an update on the FK50 and was informed by RADAR that "...he's one mile south of Humberside airport at the moment passing 500 feet in the climb". Further traffic information followed "...left 11 o'clock at a range of four and a half miles", (The radar recording indicates the range at this point was about 7nm). There was no response from the Hawk formation leader and RADAR repeated the traffic information, adding that the FK50 was now passing 1000ft. This time the information was acknowledged by the Hawk formation leader at about 1222:15, who then reported visual with the FK50. By that stage, the radar recording shows the range was less than 3nm and the Hawk formation were northbound towards the Humberside ATZ and the FK50. No change of routeing was announced by the Hawk formation leader, neither did he request entry into the ATZ. The FK50 had been allowed to depart on its clearance in the belief that the Hawk formation would pass E-W 4nm S of the airport, however, their unexpected change of course now presented a risk to the FK50's safe passage.

At 1221:47, the FK50 crew was instructed by TOWER to make an "early call" to RADAR's frequency. However, the FK50 crew did not make their first call to RADAR until over 1min later, during which time the subject ac reached their CPA. As the FK50 commenced a L turn, passing 700ft Mode C (1013mb) at 1221:57, the Hawk formation was 4.9nm SE indicating 1100ft Mode C (1013mb), with a recorded ground speed of about 365kt. The ac continued to converge but, on the radar recording, another Hawk primary contact, less than 1nm to the SE of the A7003 leader's squawk becomes visible. This would suggest at least one ac in the Hawk formation separating from the rest. At 1222:19, the A7003 squawk was at 1200ft (1013mb), 1.9nm SE of the FK50 as the latter continues its L turn towards OTR passing 1300ft Mode C in the climb. The CPA occurred over the period between 1222:26 and the next successive return at 1222:34; the FK50 indicated 1500 ft Mode C, 1nm away from the Hawk leader

AIRPROX REPORT No 123/02.

squawking A7003 indicating NMC, and on the next sweep - when they were 0.5nm apart - 1000ft of vertical separation was evident on Mode C between them. At this point, the A7003 squawk was indicating 700 ft Mode C in a L turn towards the W and passing ½nm S of the FK50, which was indicating 1700ft Mode C. The non-transponding Hawk primary contact appears to delay the turn to the L though in the next sweep it can be seen to the S of FK50 on a diverging track also. The FK50 crew did not make their first call to RADAR until 1222:51 – after the CPA - when the pilot reported climbing to FL130 towards OTR. By then, the subject ac were 2½nm apart flying away from each other. In view of the potentially serious nature of the developing conflict, it is surprising that RADAR did not initiate a call to the FK50, whereas the controller concentrated his efforts on providing traffic information to the Hawk formation leader. RADAR placed the FK50 under a RAS and then asked if the crew had been visual with the Hawk formation “as they passed underneath”. The pilot replied that they had been, but made no further comment on the RT before being transferred to the next ATSU. It was not until several hours later that the FK50’s operator notified Humberside ATC that the pilot had elected to file an Airprox.

From the information initially available to RADAR, there should not have been a conflict, however, the late, unannounced, change of route by the Hawk formation brought them within the Humberside ATZ and into conflict with FK50. Under the circumstances, RADAR’s options were limited, however, the controller acted promptly and issued the Hawk formation leader with sufficient traffic information to enable the pilot to acquire the FK50 visually. If communications between the FK50 and RADAR had been established earlier, the pilot could have been provided with updated information on the formation’s routeing during the FK50’s initial climbout, though, faced with 9 ac - possibly split into two groups - the options for avoidance were severely limited.

MIL ATC OPS reports that the Waddington RT tape transcripts are about 40 sec ahead of the radar recording time base. Consequently, the RT timings included herein have been correlated to the radar time reference. The Hawk formation departed Scampton at 1219:17 and immediately called Waddington APP. The formation was

identified, the Barnsley RPS (1015mb) issued and placed under a RIS “.....limited from below due to your altitude”. Shortly afterwards SUP called Humberside RADAR to pass on traffic information. At about 1221:35, APP passed traffic information to the Hawk leader on a Tucano ac “...traffic north-west 5 miles tracking south-east indicating low-level”, which was updated 18 sec later, “...previously reported traffic west 3 miles tracking south-east indicating 900 feet below”. Some 10 sec later at about 1222:00, the leader reported “...visual with that”. At 1222:07, traffic information was passed on the FK50 “...just airborne from Humberside 12 o'clock range 3 miles indicating similar level”. This traffic was called again by APP at about 1222:27, “...left 11 o'clock range 1 mile indicating similar level...” who added “.....confirm you are avoiding the Humberside ATZ”. The Hawk leader replied “Affirm and we're visual with that traffic”.

Waddington SUP reports that he had been briefed via landline that the formation’s route to their display at Cranwell would be “...Scunthorpe, Gamston, Scampton stub, Swinderby and then Cranwell”. APP appears to have done a good job keeping the Hawk formation apprised of traffic in their vicinity. Traffic information was passed in good time to Humberside RADAR by SUP who reported being in RT contact with the Hawk formation. The reminder to the Hawk leader about the formation's proximity to the Humberside ATZ boundary was passed somewhat late, however, as APP was expecting the ac to turn towards Scunthorpe there was possibly an element of confusion. Nevertheless, though the leader confirmed he intended to remain clear he did not do so. Neither avoiding action nor a turn could have been issued to the Hawk formation under the limited RIS, as the formation was operating below the Sector Safe Altitude for the vicinity of Humberside. APP appears to have fulfilled his obligations considering the limitations of the RIS at the formation’s transit altitude.

HQ PTC comments that the Tucano concerned was also in contact with Humberside and aware of the presence of the Hawk formation. The Hawk leader was clearly in a dilemma in being forced closer to Humberside than he would have wished by the unseen traffic reported by APP. With the advantage of good traffic information from Waddington/Humberside and an early “tally”, they were able to manoeuvre to give the FK50 the best

room they could - as witnessed by the Tucano pilot - despite their unwieldiness.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It was apparent to the Board that the Hawk formation leader's route to the Cranwell display was near to the Humberside ATZ, which he had planned to avoid. However, he had been caught out by the presence of the low-level Tucano, revealed by the traffic information from Waddington APP. Apparently unable to locate the Tucano visually – it was 900ft below his formation at the time - he elected not to execute his navigational turn as planned, that would have kept the formation clear of the Humberside ATZ. Instead, the formation continued towards it. Whilst appreciating that at the time the Tucano posed some potential hazard, military pilot members believed the leader had paid too much attention to it; the radar recording had shown it was well clear below the formation at between 3-600ft agl. Some civilian controller members were surprised at the transit speed of the formation – 360kt – and wondered if this was too fast with an unwieldy large formation. Pilots reassured the Board that the transit speed was not a factor and that the formation could be turned relatively easily – it just got too close to the airport. The Mil ATC Ops advisor stressed that Waddington APP was not concerned at the proximity of the formation to the Humberside ATZ boundary at the time because he was aware that the formation was in communication with Humberside RADAR and moreover, the leader had advised he would remain clear. Indeed the leader's early free-call to Humberside RADAR, had extracted traffic information on the FK50. Even under the FIS, RADAR provided a good flow of concise traffic information about the airliner (supplemented also by traffic information from Waddington APP) which enabled the Hawk leader to spot the FK50 and turn and descend below it, clear to the S; it also enabled the back four ac to effect safe separation on the airliner. Some controller

members counselled against pilots being in contact with two separate ATSUs at the same time, believing it was a recipe for potential confusion. Pilots, however, understood the need while acknowledging the controller's reservations.

Humberside RADAR had provided good service, well above that normally provided for a FIS and had kept the jet pilots apprised of the FK50's relative position, but that did not imply giving permission to enter the ATZ. At that stage RADAR had been expecting a call imminently from the departing FK50 crew yet some members were surprised that the controller had not initiated a call to the airliner with traffic information. Meanwhile, all this was unknown to the FK50 crew at the time who were busily trying to sight the formation, following the TCAS TA. There was little more that they could have done other than maintain their departure profile as they searched for the jets, which they had been told were routing 4nm S of the airport from E to W. That the FK50 pilot had heard the Hawk leader report visual with his airliner to RADAR was useful, but the FK50 crew had been left out of the loop. In effect the FK50 crew had not received any updated traffic information from ATC after they were told the Hawk formation would pass 4nm S of the airport. But the FK50 crew had not helped themselves, taking some time before calling RADAR – over 1 min – as pointed out by controller members. A CAT pilot explained, however, the FK50 pilot would have been fully occupied flying the ac, as the F/O searched for the intruders. What had to be kept in mind was that the FK50 crew had a reasonable expectation that their take-off and IFR departure would continue within the ATZ unhindered by transit VFR ac that should have remained outside the zone. Consequently, the Board agreed that the unauthorised penetration of the Humberside ATZ by the Hawk formation was fundamental to the cause, which had resulted in the formation flying into conflict with the departing FK50. However, in this dynamic situation the FK50 had been spotted at range, early enough for the formation to manoeuvre away from it, in two sections. The Board recognised that this would have been very unpleasant for the FK50 crew as all of the action happened unseen astern - the radar recording showed ½nm horizontal separation and 1000ft vertical separation against the leading Hawk. In the Board's view the formation's avoiding actions

AIRPROX REPORT No 124/02.

had, in the end, entirely removed any risk of a collision.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Unauthorised penetration of the Humberside ATZ by the Hawk formation, which flew into conflict with the FK50.

Degree of Risk: C.

AIRPROX REPORT NO 124/02

Date/Time: 19 Jul 1244

Position: 5031N 0028E (3NM NNW HARDY)

Airspace: CTA (Class: A)

Reporting Aircraft Reported Aircraft

Type: BA46 SB20

Operator: CAT CAT

Alt/FL: FL230 ↑FL230

Weather VMC CLOC VMC CLNC

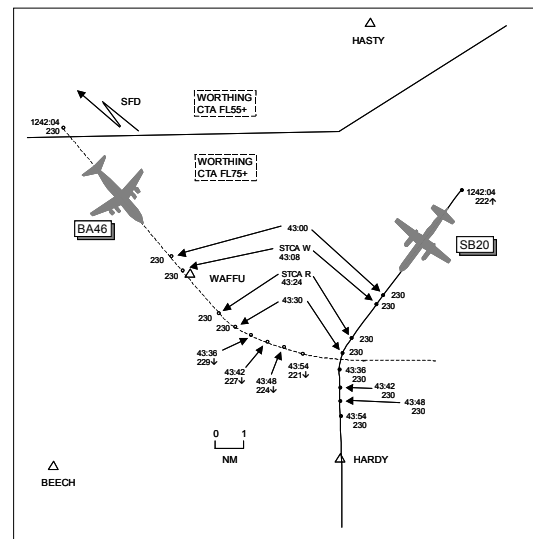
Visibility: 10km 50km

Reported Separation:

0ft V 3nm H 0ft V 4nm H

Recorded Separation:

600ft V 2.8nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BA46 PILOT reports heading 155° at 280kt and FL230 and in receipt of an ATC service from LONDON. When 35nm SE SFD ATC issued an instruction "avoiding action turn left heading 090°" which he complied with and as he turned, TCAS indicated traffic ahead range 7nm at the same level. ATC then told him to descend immediately to FL210 which he did by disconnecting the AP and commencing a rapid 'hand flown' descent. Meanwhile the FO, PNF seated on the RHS, had visually acquired the subject SB20 about 3nm ahead at the same level and watched it pass about 3nm away to his R and above. During the encounter he had only received a TA alert. From his viewpoint it appeared that ATC had turned him into conflict with the other ac which had then necessitated a descent to avoid. He assessed the risk of collision as high.

THE SB20 PILOT states that his report was completed from memory as there had been no mention at the time that any reports would be required. He had been placed on a radar heading by LONDON,

he was not sure possibly 110°, when he was told to turn **R** onto 070°. He immediately queried the direction of the turn "c/s confirm **L** heading 070°" whilst he continued on heading. ATC then turned their attention to another ac on frequency, he thought, by giving an avoiding action turn which was acknowledged immediately. Meanwhile he scanned TCAS for traffic which was detected in his 3 o'clock range 7nm at the same level. ATC then confirmed that his turn direction was to be **L** and seconds later a TA alert was received, momentarily, on TCAS. The conflicting traffic was seen visually at a safe distance, which went on to

pass about 4nm behind at the same level; no RA alert was received. He assessed the risk of collision as low.

UKAB Note (1): The RT transcript reveals that the SB20 pilot was following an assigned heading of 225° when transferred to Sector 18, which he reported on initial contact, with the SC issuing a **R** turn onto 190°. After clarification of the required turn direction, which was changed to **L** and upgraded to 'avoiding action', the pilot acknowledged the instruction immediately. There was no intermediate delay whilst awaiting turn direction confirmation, injected by the SC talking to another ac, as perceived by the SB20 pilot.

ATSI reports that at the time of the Airprox, both ac were under the control of LACC Sector 18 with both the workload and traffic loading being described as 'light to medium'.

The BA46 was en route from Manchester to Paris Charles De Gaulle, cruising at FL230. At 1226:20, the ac's flight details appeared on the S18 Planner's Electronic Flight Strip bay and it was accepted into the sector at FL230 and planned out of the sector at FL230. Once the exit flight level of FL230 had been actioned, the planner saw no further need for the electronic strip and so it was removed from her display. This is in accordance with the standard method of operating at LACC. At 1231:00, the Sector 18 Planner's electronic display showed automatic acceptance of the SB20 with an entry level of FL200, in accordance with the relevant standing agreement. However, some 30 sec later, the Sector 17 Planner telephoned the S18 Planner requesting a higher level for this flight. (*There is doubt, whether at the time of this phone call, the relevant paper flight progress strip had been placed in the S18 Tactical controller's strip bay*).

The SB20 had departed London City Airport bound for Zurich, and, at the time of the telephone call, was still some 7nm NW of DET VOR passing FL71. The S18 Planner reported that the S17 Planner had suggested FL230 as a suitable level for the SB20, but examination of the telephone recording did not support this and indicated that the S18 Planner had suggested the level. Furthermore, the coordination agreed was "*Twenty three released for climb and turn*". As this exchange did not specify 'climbing to...' there was

an implicit requirement for the SB20 to be level at FL230 before entering S18 airspace.

When the S17 Planner telephoned, the BA46 was 18nm NW of Heathrow, amongst a number of other of ac, which would have made identification of this one particular ac on radar virtually impossible. At 1235:40, the BA46 established communication with the S18 Tactical controller and reported at FL230 towards SFD. At the time the BA46 reported on frequency, its position was approximately 10nm NW of Gatwick, with the SB20 in its 10 o'clock position at 44nm, passing FL149.

The SB20 contacted the S18 Tactical controller at 1242:35, when it was passing FL225 for FL230, on radar heading 225°, in the 10 o'clock position of the BA46 at a range of 11.8nm. The SB20 had called rather later than normal and so was already within S18 airspace. The Tactical controller transmitted: "*SB20 c/s roger climb correction SB20 c/s turn right (sic) heading one nine zero expedite the turn*". Aware of an apparent L/R error the crew of the SB20, not surprisingly, sought confirmation that the turn direction should be L. The controller replied "*Affirm and make that turn as tight as possible it is avoiding action turn left immediately heading one nine zero*".

The instruction was acknowledged by the crew and, at 1243:08, STCA activated when the two ac were at the same level, 7.3nm apart and converging. The controller then transmitted "*BA46 c/s avoiding action turn left immediately heading zero nine zero*". This was promptly acknowledged, and complied with, by the crew. At 1243:26, STCA activated as the controller instructed the BA46 to "*...expedite your descent to flight level two one zero*". During this exchange, the Planner was offering advice to the Tactical controller in respect of avoiding action.

[UKAB Note (2): The Pease Pottage recorded radar at 1243:30 shows lateral separation reduced to 4.3nm, at which point the ac were at the same level and further reduced to 2.7nm (1243:54) but by that stage standard vertical separation had been re-established. Minimum separation occurs at 1243:48 with the SB20 at FL230 2.8nm SE of the BA46 which is descending through FL224 (ROD 3000fpm).]

AIRPROX REPORT No 124/02.

The Planner explained that it was her normal practice to remove electronic strips into the 'Dead Bay' as soon as all the relevant tasks, i.e. setting entry and exit levels, had been completed. She advised that this was in accordance with her training where it was emphasised that the electronic data should be regarded as a 'To Do List' rather than an electronic flight strip display, and with the procedure detailed in MATS Part 2 Mops 5.1 para 5.1.1.6. This states: *'Once an offer has been accepted by the next sector (NSN), it is recommended that the Accepted strip is dropped to the Dead bay. This way the Accepted bay will be kept to a minimum and will represent a list of the Planner's outstanding tasks. Whilst acceptable in most circumstances there may be flights for which there are good air traffic reasons why the strip should not be dropped. The Planner should use their discretion and experience'*. When questioned as to what process she had followed to establish a safe, higher level for the SB20, she was unable to give a detailed answer. She advised that she had carried out the actions almost sub-consciously.

The unit's MATS Part 2, Gen 3.7, para 3.7.3 describes the Responsibilities of the Planner, including: *'Ensure that separation exists at the time of acceptance between the entry flight level of ac entering the sector and*

- the entry or sector flight levels*, if these have been input, of all previously accepted ac; and

- *the allocated exit flight levels of all previously accepted ac'*. (*Note: the sector flight level is defined as any level that has been entered after acceptance). MATS Part 2, Page Mops 1.4, para 1.4.2 details the Planner tasks. Included is: *'When accepting a new offer the Planner uses a combination of paper flight strips, radar and 'looksee'*. It was not possible to find a definition of 'new offer' in the MATS Part 2 but it is likely to mean the first time an ac is offered to the sector. If this is the case, then the requested climb coordination on the SB20 would not be covered by this requirement. It appears unlikely that the S18 Planner could have successfully used radar to assess that FL230 was a safe level for the SB20 as she had her radar display set with the 'background = foreground' option selected. This would have resulted in all ac, and not just those within her sector, being highlighted on the display, whereas if this option had not been selected the

Track Data Blocks (TDBs) of ac outside the sector Volume of Interest (VOI) would have been shown in grey. It is therefore highly probable, due to the radar display selection, that the S18 Planner would not have been able to see the BA46 when the S17 Planner requested climb coordination on the SB20. This was due to all the TDBs in the vicinity of the BA46 being highlighted which resulted in significant overlapping and illegibility of the TDBs.

The unit's MATS Part 2, Gen 2.4 para 2.4.4, details conditions under which the Planner may use radar for planned separation purposes. This gives the following minima: *'20nm or more between ac on converging or crossing tracks, at the same level, offered from different sectors; or less than 20nm between ac on converging or crossing tracks, at the same level, offered from different sectors, provided that the Tactical is informed of the actions taken. The Tactical must annotate the paper flight progress strip with a diagonal line in Box E'*. This was not done.

The Planner has two electronic devices available to assist in identifying safe levels for entry into, and exit from, the sector. In the case of entry levels the facility is called 'look see' and when used, will highlight the TDBs and electronic strips of offered or previously accepted flights whose entry flight level matches that of the subject flight. For exit levels, the facility is known as 'what if' but operates in a very similar manner.

S18 Tactical controller used paper flight progress strips but the S18 Planner advised that they were not usually referred to by Planners to identify potential conflicts and confirmed that it was not her normal practice to use the Tactical controller's paper flight strips for this purpose. This practice is at variance with MATS Part 2 Mops 5.1, para 5.1.1.2.3 which states:

'Mandatory – The Planner must refer to the paper flight strips when considering an offer in the following circumstances:

....for vertical coordination when giving away a flight level within the sector (including the highest and lowest level).'

The Standing Agreement, which the SB20 was subject to, was to be level FL200 by HASTY and the Planner had coordinated the flight out at

FL250, having used the 'what if' facility to ascertain whether the requested level of FL270 was clear which it was not. Use of the electronic facility by the Planner to check for conflicts at FL200 and FL250, in respect of the SB20, would have revealed none. Therefore, it would have been apparent to the Planner that the normal entry level of FL200 and the exit level of FL250 would have both been safe.

It was unlikely, due to bunching of traffic, that the TDB of the BA46 would have been visible to the S18 Planner and this was confirmed when, as part of the investigation, a replay of her workstation was made. It is therefore difficult to see how she could have used planned radar separation between the BA46 and the SB20. Accordingly, it would appear that the methodology followed by the Planner, in accepting the SB20 into the sector at a level other than the standing agreement, was flawed. Even if it had been based on radar separation, the judgement that there would have been 20nm or more between the subject ac was unsound.

Although the BA46 was routeing via the SFD VOR, there is no SFD fps produced, but for the SB20 which crosses this track, there are SFD and VEULE strips produced. Analysis of the fps shows that the time for the BA46 to reach a position 13nm E of MID was 1238, and the estimate for the SB20 at WAFFU, approximately 35nm SE of the E abeam MID fix, where the tracks would cross, was 1242. Correlation of this information should have indicated that the flights would be in fairly close proximity as they approached WAFFU.

The S18 Tactical controller reported her surprise at the level of the SB20 as she had been expecting it at FL200, as is standard. She could not recall being told by the Planner that the entry level had been amended and the paper flight progress strip had not been cocked out to draw the Tactical's attention to the change. The revised level of FL230 had been written in green (i.e. by the S18 Planner) on the S18 Tactical controller's strips. As stated earlier, had the Planner used radar to assess whether separation would exist between the BA46 and the SB20, then MATS Part 2 required her to ensure the Tactical controller had been informed and, if less than 20nm radar separation existed, the Tactical controller should have annotated the paper fps as described earlier.

This was not done, supporting the Tactical's claim that she had not been made aware of the change of entry level.

The Tactical controller was asked why she had not continued the SB20 climbing to assist in resolving the conflict. The controller advised that she had recently completed her TRUCE training, which strongly emphasised turning the subject ac to resolve conflicts. Comment was also made that she was unaware of the change to the avoiding action phraseology (*changed in Amendment 52 to MATS Part 1, effective 28th December 2001*) until her recent TRUCE training, i.e. 7 months after publication. The point was also strongly made that, in the opinion of several controllers, the new phraseology was unwieldy and far less easy to use than the previous version.

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 thanked the ATSI advisor for his full and detailed report. ATCOs were unable to reconcile the S18 Planner's actions; for whatever reason, she had not followed the procedures contained in MATS Pt 2 and had co-ordinated the SB20 into the sector without taking the BA46 into account. This had been a part cause of the Airprox. Furthermore, although the Planner had annotated the SB20 fps in green with the revised level (FL230), it was apparent from the Tactical controller's actions, that she had been surprised at the SB20's 'appearance' on frequency, in her sector, above the normal standard agreed level (FL200) and in confliction with the BA46. This suggested to members that the Planner had not informed the S18 Tactical of her actions and they concluded this omission had also been a part cause.

Although it was unfortunate that the Tactical controller had made an initial L/R turning error with the Saab, her actions had been prompt, including the 'avoiding action' L turn and descent given to the BA46 crew to resolve the confliction, prior to STCA activating. The SB20 crew had

AIRPROX REPORT No 125/02.

taken the ATC turn, acquired the BA46 on TCAS, received a momentary TA alert as they visually acquired the BA46 on their RHS and had watched it pass clear behind. Members commended the BA46 crew's robust response to the ATC turn and descent, which almost certainly had led them only to receive a TA alert. Although the BA46's L turn had initially pointed it directly at the SB20, the dynamics of the encounter meant that the subject ac then flew on quickly diverging tracks laterally, with the BA46's ensuing descent increasing the separation in the vertical plane. All of these

recovery elements combined persuaded the Board that any risk of collision had been removed.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The S18 Planner co-ordinated the SB20 into the sector without taking the BA46 into account and did not inform the Tactical controller.

Degree of Risk: C

AIRPROX REPORT NO 125/02

Date/Time: 21 Jul 1054 (Sunday)

Position: 5146N 00043W (1.7nm SSE Halton - elev 370 ft)

Airspace: Halton ATZ (Class: G)

Reporting Aircraft Reported Aircraft

Type: ASK21 C152

Operator: Civ Club Civ Pte

Alt/FL: 1200ft 1900ft

(Halton QFE NR) (QNH 1020 mb)

Weather VMC CLBC VMC CAVOK

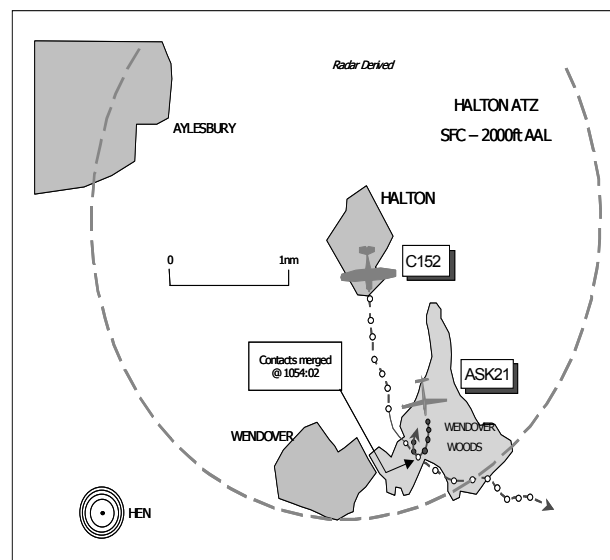
Visibility: 25km 10km

Reported Separation:

150ft V, NIL H 200ft V, NIL H

Recorded Separation:

NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE SCHLEICHER ASK21 GLIDER PILOT reports that he was conducting an instructional flight from Halton in VMC, 1500ft beneath cloud and with 25km forward visibility. He was at 1200ft (Halton QFE) circling to the right in a thermal at 45kt when a high-wing single engine ac, flying straight and level, flew 150ft above him. The other ac, which was difficult to see as it was grey against grey cloud, was first seen at 200m; this gave insufficient time to take any avoiding action. The other ac, he thought, was at less than 1400ft (QFE) and therefore within the ATZ. He checked with Halton Radio, on 130.425MHz, and although the other ac had been seen, no call had been received.

The ASK21 pilot also reports that his ac was white with red trim. Though he provided no assessment of risk, he said that the proximity of the other ac passing OHD was "far too close (for comfort)", adding that since he was circling in a thermal, in approximately 20 secs he would have been at the height of the other ac.

UKAB Note (1): Met Office archive data reveals that the Luton 1050 UTC QNH was 1018mb. Consequently, the Halton QFE is estimated to have been 1006mb at the time of the incident.

THE C152 PILOT reports that after taking account of restrictions in the Brize Norton AIAA, the

Farnborough area and other active airfields and control zones, his planned route of flight was Wycombe Air Park/Booker – Oxford City – Berkhamsted – Wycombe. His planned altitude was 2000ft on 1020 QNH. But when he checked the radio in his ac there were comms problems, so he elected to stay on the Wycombe frequency, 126.55MHz, for the duration of his flight and replace Oxford with Aylesbury in his itinerary.

As a local resident he has considerable knowledge of the ground and airspace in the Halton area when it was closed, however he had not flown in the Halton area for some time when it was active. He arrived overhead Aylesbury at about 1050 and setting a visual course for Berkhamsted he noticed some gliders below his horizon on the scarp at Wendover Woods. His intention was to fly near the gliders at a safe horizontal and vertical distance to add interest for his passenger. He was very aware of the large amount of GA traffic in the Elstree – Bovingdon – Aylesbury corridor and was more conscious than usual of the need to keep a good look out for other ac. However, he forgot that Halton ATZ would be active and assumed that his separation would be as per rules for outside ATZs. He arrived overhead Halton, at about 1054, at 80kt and altitude 1900ft on 1020 QNH and only then realised his error in that the field was active. Consequently, he also realised that the 4 gliders in sight would take a less positive stance towards his presence. He decided not to make any rapid manoeuvres, but turned gently on to a southerly heading to avoid the gliders who were positioned between the scarp at Wendover and Halton airfield. He decided not to make any radio call because he did not consider there to be any danger and there was considerable traffic on the Wycombe frequency. He commenced a gentle climb to regain 2000ft on 1020 QNH and continued to keep a reasonable vertical separation from the gliders below him. During his transit between Halton and Wendover village a turning glider passed beneath at 200ft range but he considered that there was no chance of a collision at any time. After clearing the Halton ATZ he turned back on to his planned course returning to Wycombe via Berkhamsted. He reported the ac radio fault on return and this was subsequently found to be a problem with the passenger headset.

He also reports that his ac was white and light blue in colour. He adds that he was most disappointed with himself in that after 34 years of flying he could make such an oversight as to penetrate an active ATZ without clearance.

UKAB Note (2): UK AIP ENR 2-2-2-2 promulgates the Halton ATZ as a “*Circle radius 2 nm centred on longest notified runway (02/20) 514734N 0004416W, vertical limit 2000 ft aal. ... Airfield elevation: 370 ft.*”

UKAB Note (3): Given that the C152 pilot was flying at 2000ft on 1020mb this would equate to 1580ft on the estimated Halton QFE 1006mb and place him within the Halton ATZ.

UKAB Note (4): Analysis of the Heathrow (23cm) radar recorded data is not conclusive. However, the data reveals that at 1053:14 a primary contact appears at the southern end of Halton Airfield tracking S; this is believed to be the C152. Additionally two primary contacts are evident about one nm to the SE of Halton. One of these, at 11 o'clock to the C152, is tracking slowly S whilst the other, at 10 o'clock to the C152, tracks N for one sweep before disappearing. The primary contact thought to be the C152 then disappears for 2 sweeps before reappearing 0.3nm SSE by which time the other primary contact has commenced a right turn approx 0.1nm at 11 o'clock. The contacts merge at 1054:02. Thereafter, the return believed to be the C152 continues SE and then E before clearing the Halton ATZ at 1054:36. The other primary contact, which is believed to be the ASK21 glider, continues the R turn onto N.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members noted the similarity of reports from both pilots supported by the recorded radar data. Moreover, they also noted the C152 pilot's frank admission of both his penetration of the Halton ATZ and his overflight of a glider. It was clear, therefore, that the encounter was precipitated by the C152 pilot as a result of his penetration of the Halton ATZ without obtaining information from the appropriate A/G radio station. Pilot members

AIRPROX REPORT No 126/02.

expressed some surprise that the C152 pilot should have elected to fly near to the gliders, although it was acknowledged that lack of avoiding action against the reporting glider appeared to have been unintentional and the result of late or non-sighting, possibly because it presented a near tail-on aspect before commencing its turn to the R. To compound the situation further, both the glider and the C152 were coloured white and therefore each would have been difficult to see against background cloud. This would probably account for the late sighting of the C152 by the ASK21 pilot. As to risk of collision, the Board was of the view that safety

had been compromised, since the ASK21 glider pilot was climbing and had been unable to take avoiding action as he was overflowed by the C152 pilot.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Penetration of the Halton ATZ by the C152 pilot without obtaining information from the A/G radio station.

Degree of Risk: B

AIRPROX REPORT NO 126/02

Date/Time: 18 Jul 1110

Position: 5150 N 0030 W (LUTON RW08 Approach)

Airspace: Luton CTR (Class: D)

Reporting Aircraft Reported Aircraft

Type: B757 PA-38 Tomahawk

Operator: CAT Civ Pte

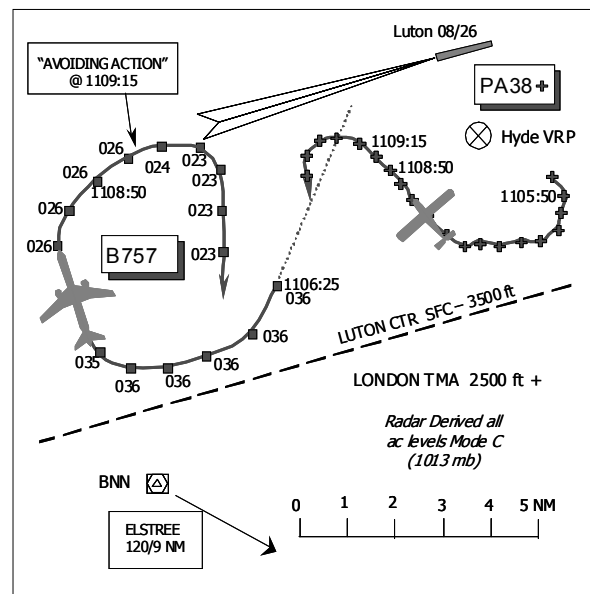
Alt/FL: 2500ft ↓ 2000ft
(QNH 1022 mb) (QNH 1019 mb)

Weather VMC CLBC VMC CAVOK

Visibility: 10 km

Reported Separation:
3 NM H, NR V NR

Recorded Separation:
2.2 NM H, NR V



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE B757 PILOT reports that he had been cleared for an approach to RW08 at Luton and was established on the ILS with gear down and intermediate flap. Autoflight and autothrottle systems were engaged. Prior to the approach, ATC had passed Traffic Information (TI) on an unknown ac in the CTR, which was not seen. Once established on the ILS further TI was passed, followed by instructions to turn right immediately onto south. The autopilot was disconnected and the instructions were complied with whilst maintaining altitude. The ac was

subsequently vectored for a second uneventful approach. No TCAS indications were available to aid acquisition and the pilot does not report achieving a visual sighting. Separation was therefore reported on the basis of the controller's TI, and the risk was assessed as medium to high.

THE PA-38 TOMAHAWK PILOT reports that his ac was coloured white and red and was receiving a FIS from Elstree Information on frequency 122.4. The ac was fitted with a transponder but no Mode C, and external lighting consisted only of

nav lights. TCAS was not fitted. The pilot was unaware of the Airprox but has described his flight profile at the time. He had taken off from Elstree RW08 in good weather at 1045z and, using the Direction Indicator (DI) had turned left onto what he thought was 280° inbound for Bovingdon disused airfield, an estimated 8 mins flying time away. As the airfield was a distinctive feature, he did not bother to tune the BNN VOR. After 8 mins he could not see Bovingdon, but did see Luton Airport, just to the right of the ac nose. Realising that he must be in CAS he checked his compass to find it reading about north, with the DI indicating 285°. He turned left immediately onto a compass heading of about 220° and tuned the BNN VOR to assist his navigation. He estimated that he had been in CAS for about 10 mins during which time he thought it possible he could have been seen by the other ac.

After landing he was asked to contact LTCC and he explained to them that a navigational error had occurred. He was informed that the incident would be formally reported and was left in no doubt about the seriousness of the incident. He subsequently sought the advice of a PPL examiner and identified how the error occurred and how to prevent it occurring again.

UKAB Note (1): The DI in this ac type is a gyro instrument which senses movement about the vertical axis but which has no automatic north-sensing capability built in. It is subject to precession errors which can cause the displayed heading to drift, so it must be checked and set against the main ac compass before take-off and at frequent intervals during flight.

UKAB Note (2): Although the PA-38 pilot reports that a transponder is fitted, there are no secondary returns from the ac seen on radar.

UKAB Note (3): Analysis of the Heathrow Radar recording from 1105 to 1110:50 shows a primary return, believed to be the PA 38, about 3 NM SE of Luton heading southeast at first, then south. Whilst still in the CTR, the ac turns west for a while before turning onto northwest. It continues on this track until, at 1109:15 when the avoiding action is being passed to the B757, the PA38 starts a left turn onto a southerly track and is seen maintaining this when the recording ends.

LTCC ATCI reports that the event occurred 4 NM south west of Luton at 1110 UTC, and involved the DIRECTOR (DIR) controller. All facilities were reported as serviceable. At 1101 the DIR contacted the Tower controller to ask if he was visual with unknown non-squawking traffic to the south west at 4 NM which appeared to be orbiting. The Tower controller could not see the traffic, which was reported to a B737 which was about to start an approach. At 1104 Tower called to report that the traffic had been sighted and identified it as a PA-38. At 1105 the ac was observed in the vicinity of HYDE VRP. DIR made blind calls to try to determine whether the ac was on frequency but these were not answered. At this stage, the B757 was being vectored for its approach.

The B757 was advised of the presense of an unknown contact as it turned onto final approach at 3000ft. The traffic was reported as being at 2 o'clock and 5 NM, heading north. The B757 reported established on the ILS at 1108:50 and DIR cleared the ac to descend on the ILS, updating the crew on the traffic, believed to be a Tomahawk, which was still 2 o'clock, 5 NM heading north. By 1109:15 DIR was concerned at the potential confliction between the two ac and instructed the B757 to turn right immediately for avoiding action onto a heading of 180°. This was complied with and at 1110:13, with the B757 still turning, lateral separation reduced to 2.2 NM. Based on a Tower reported estimated height of 1500 ft, vertical separation may have been preserved, with the B757 at 2500ft (UKAB Note : The PA-38 pilot's report, submitted later, quotes an altitude of 2000ft on an unspecified QNH of 1019).

The B757 was subsequently re-positioned for the approach, with the PA-38 tracking away to the south. The B757 captain subsequently filed an Airprox.

ATSI reports that it concurs with 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 and operating authorities.

AIRPROX REPORT No 126/02.

The Board noted that there were significant differences between what the PA 38 pilot said he did and what the radar recording showed that he did; the flight had clearly not tracked into and out of the CTR as described. General aviation specialists noted that, in explaining the events, it would have been useful to know the experience level of the PA 38 pilot, but this information was not available. As it was, his actions suggested his 'inexperience', though this in no way excused them. On the other hand, if the pilot was experienced, his actions amount to gross navigational errors (landmarks in the area concerned are considered to be good) and poor in-flight management. This opinion was partly based on the fact that he had made no attempt to contact Luton when it was realised that he had been in the CTR for some considerable time. Assuming that the DI was serviceable, members deduced that the pilot had not aligned it prior to take-off, as it would not have precessed by such an amount in the time stated. In essence, this incident started well before the PA 38 took-off, and errors were founded in poor pre-flight preparation and lack of knowledge.

The Board considered the actions of the controller, who had been faced with a difficult situation in providing both a safe and expeditious service. It was noted that when he turned the

B757 onto final approach, it was apparently into conflict with the PA 38, but this was balanced by two things; first, there was initially no indication that the intruder would not continue in its orbit and second, full TI was being passed to the B757. There were also significant airspace constraints, which was the reason for the avoiding action being to the south (turning north was not an option). In assessing the risk, the Board considered that the controller had kept the B757 pilot informed and had monitored the unknown contact, taking sensible and appropriate action when it conflicted. These actions had effectively removed the risk of a collision.

It was noted that the B757 had apparently filed an Airprox on the basis of separation passed by the controller and the avoiding action. This was considered unusual, and an important learning point was that receipt of avoiding action did not imply that separation had been lost.

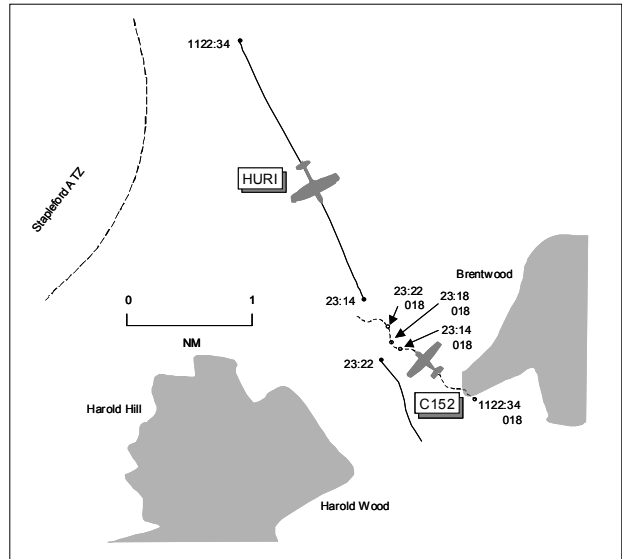
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Unauthorised penetration of the Luton CTR by the PA 38 pilot.

Degree of Risk: C

AIRPROX REPORT NO 127/02

Date/Time: 21 Jul 1123 (Sunday)
Position: 5137N 0015E (4nm SE LAM)
Airspace: FIR (Class: G)
Reporting Aircraft **Reported Aircraft**
Type: C152 Hurricane
Operator: Civ Trg Civ Pte
Alt/FL: 1800ft c2000ft
 (QNH 1018mb) (QNH NK)
Weather VMC CLBC VMC CLBC
Visibility: >10km 20km
Reported Separation:
 150ft H 30ft V 100m H
Recorded Separation:
 <0.15nm

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

THE C152 PILOT reports flying a dual local training sortie (trial lesson) from Stapleford at 1800ft QNH 1018mb squawking 7000 with Mode C and in receipt of an A/G service from Stapleford on 122.8MHz. The visibility was >10km 200ft below cloud in VMC. The ac was coloured white with brown stripes and the anti-collision and strobe lights were switched on. Heading 340° at 95kt passing abeam of Harold Wood, he saw a low wing single engined ac, either a Spitfire or Hurricane, converging almost head on, late in his 1 o'clock range 300ft at the same level as it emerged from behind the starboard door pillar. He immediately initiated a steep R turn to avoid, the other pilot carried out the same manoeuvre shortly afterwards. The other ac was seen to pass 150ft clear to his L and he assessed the risk of collision as high.

THE HURRICANE PILOT reports heading 135° at 170kt cruising at about 2000ft QNH, and he was not in receipt of any ATS. The visibility was 20km >500ft below cloud and his camouflaged ac did not carry any lighting nor a transponder. When passing 4nm SE of Stapleford, he saw a Cessna, possibly a C152 or C172 coloured white with a stripe, in his 11 o'clock range 600m converging (but not on a collision course as both ac would have missed if no action was taken). He initially took no action as the traffic was on his L but as it

approached closer without any avoiding action, he turned R. The Cessna was also seen to turn R and pass 30ft above 100m clear on his L. He had seen the Cessna late but in enough time to wait and see if the other pilot had seen him and would take any action.

UKAB Note (1): The London QNH for 1120Z was 1018mb.

UKAB Note (2): Analysis of the Heathrow, Debden and Stansted recorded radars at 1122:34 shows a 7000 squawk indicating FL018 (1950ft QNH 1018mb), believed to be the C152, 5.1nm SE of Stapleford tracking 305°. At the same time, a primary only return, believed to be the Hurricane, is seen 2.9nm E of Stapleford tracking 155°. The Hurricane continues on a steady track whilst the C152 continues tracking generally towards Stapleford with minor heading deviations. At 1123:14 the Hurricane is 0.5nm NW of the C152 before fading from radar whilst the C152 is seen in a R turn on the next radar sweep. Although the CPA is not captured on any of the recorded radars, it is estimated to occur during this period as the subsequent radar sweep at 1123:22 shows the Hurricane now 0.25nm S of the Cessna, which is tracking 350°, indicating FL018 (1950ft QNH). Taking into account the Hurricane's speed immediately prior to and post

AIRPROX REPORT No 127/02.

radar fade, it is estimated to pass within 0.15nm (275m) of the Cessna.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Pilot members were familiar with 'blind spots' created by ac structures. However, the onus is on the pilot to move his head or alter the ac's flight path to 'unmask' any traffic which may be obscured. From the geometry of this almost head-on encounter, it would have been difficult for either pilot visually to acquire one another at an earlier stage; the ac colour schemes undoubtedly had been effective in 'blending' the ac outlines into their respective backgrounds. Both pilots agreed that this Airprox had been caused by late sightings and the Board concurred with their opinions.

From the Cessna pilot's viewpoint, the Hurricane had suddenly appeared from his 1 o'clock position

very close in at the same level; he immediately executed a steep R turn to avoid. From the other cockpit, the Hurricane pilot believed the Cessna to be on a converging/crossing track and, under the Rules of the Air, would give way to him. In the short time available from his first sighting of the C152, he was able to assess that the ac were not going to collide but he had waited to see if the Cessna pilot had seen him and would be taking any avoiding action. As no avoiding manoeuvre was seen, he had also turned R to avoid, passing about 100m clear of the conflicting ac on his L. Members agreed that although the ac were not going to collide and the outcome had been resolved by both pilots, they had passed sufficiently close to the extent that safety had been compromised.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Late sightings by both pilots.

Degree of Risk: B

AIRPROX REPORT NO 128/02

Date/Time: 23 Jul 0824

Position: 5107N 00017E (17nm SE BIG)

Airspace: London TMA (Class: A)

Reporter: LTCC SE

First Aircraft Second Aircraft

Type: B737(A) B737(B)

Operator: CAT CAT

Alt/FL: FL154↑ ↓FL150

Weather: IMC KLWD

IMC KLWD

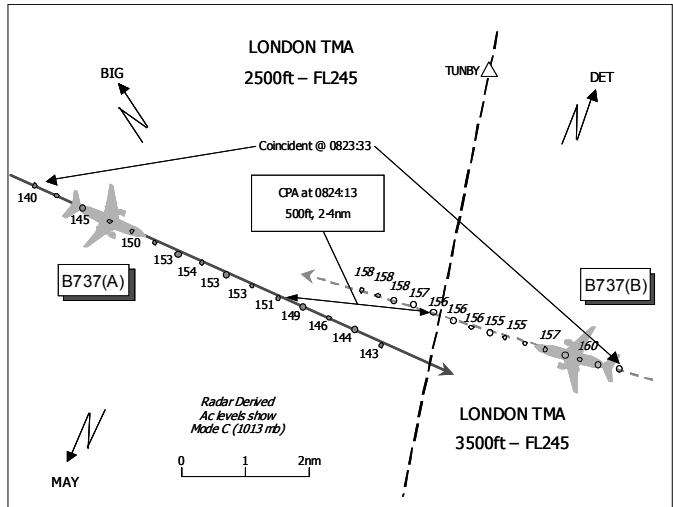
Visibility: NK NK

Reported Separation:

200ft V, 2.5nm H 200ft V, 2.5nm H

Recorded Separation:

500ft V, 2.4nm H

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

THE LTCC SE SECTOR CONTROLLER (TC SE SC) reports that B737(A) was climbing, on radar hdg 125°, to FL170 and B737(B) was descending to FL110, he thought, locked on hdg for the other traffic. The assigned hdgs, however, did not provide separation and as the ac approached each other he realised his mistake. Therefore he issued avoiding action, though too late to prevent a loss of separation.

B737(A) PILOT reports that he was outbound from London Heathrow for Brussels on a DET2F SID, squawking 0361 with Mode C and in receipt of a service from LTCC on frequency 120.525MHz. When passing FL154, in IMC, in the climb to FL170 and hdg 125° at 280 kt, he received, simultaneously, a TCAS yellow TA and ATC instructions to descend to FL150. The autopilot was disconnected and descent initiated but approximately 3 to 5 sec later the TA changed to RA "Climb". Accordingly he initiated a 200 – 300 fpm climb as indicated by the climb symbol. The conflicting ac showed 200ft above at this time. TCAS then commanded RA "Descend Now". Although the other ac was not acquired visually, it was shown on TCAS as 2.5nm to his left and 200ft above. He assessed the severity of risk as high.

B737(B) PILOT reports that he was inbound to London Heathrow from Paris (CDG), squawking 7562 with Mode C and also in receipt of a service from LTCC on frequency 120.525MHz. During descent to FL150 and hdg 320°, he thought, at 250kt a TCAS "Descend" RA enunciated followed, immediately, by RA "Climb Now". He complied with the TCAS RA instructions and maximum deviation was 600ft. Because he was in IMC he did not see the other ac. However, TCAS displayed the other ac 2.5nm to his left and 200ft below. He assessed the severity of risk as medium.

ATSI reports that both ac were under the control of the TC SE SC whose workload and traffic complexity were both described as 'Moderate'. However, the controller was content to operate with the Biggin, TIMBA and SE Low Sectors banded. Relevant ATC equipment was all reported to have been serviceable at the time.

B737(A) took off from Heathrow on a DET2F SID and established communication with the SC at 0817:40, passing 4000ft for 6000ft. This transmission was acknowledged and shortly afterwards the pilot was instructed to leave EPM hdg 125°. At that time, B737(B) was 62nm SE of

AIRPROX REPORT No 128/02.

B737(A), working an en-route sector and on a near reciprocal track.

At 0820:10, B737(B) established communication with the TC SE SC and was instructed to maintain FL150, its cleared level, on reaching. The SC advised that a 15 min hold at BIG was likely. The crew reported that they were on a radar hdg of 320° but the SC released the ac on its own navigation to BIG. The SC explained, at interview, that his plan had been to descend B737(B) to FL130 and, once B737(A) was clear of a B757 inbound to BIG, climb B737(A) to FL120. This was his standard method of resolving such conflicts, which arise frequently on this sector. The B757 was approximately half way between the two B737s and diverging from the track of B737(A).

The SC had planned to keep B737(A) on a hdg of 125°, until it was E abeam Gatwick, close to the final approach track, before turning it L onto a hdg of 075° and climbing it S of the BIG hold. At 0820:25, B737(A) was cleared to climb to FL90 as this would provide vertical separation against the B757 descending to FL100. The SC was monitoring the relative positions of all 3 ac to confirm that his original plan was still viable.

At 0821:20, B737(A) was further cleared to climb to FL170 and, almost immediately afterwards, B737(B) was instructed to turn L 20°. The SC explained that the hdg change given to B737(B) was part of his plan to facilitate the cross of tracks between the two B737s once he had turned B737(A) L onto an easterly hdg; however, he could not explain why he had instructed B737(A) to climb to FL170, when it was his intention to issue a clearance to FL120 only. As he had only issued a hdg change to one ac and not both, as was his original plan, the B737s were now hdg directly towards each other, 33 miles apart.

The SC then became involved in dealing with other traffic in his sector. He advised that he would have had a BIG strip on B737(B) and a DET strip on B737(A). These would have been located in separate, but adjacent bays on his flight progress board. At interview, the SC indicated that his usual manner of operating was to formulate a plan and mental picture by referring to the strips and radar. This plan could be adapted tactically by monitoring its progress using the radar. On this occasion, however, although the initial plan was sound, the unsafe and

unintentional clearing of B737(A) to FL170 suggests that his mental picture was incomplete. It was whilst he was checking his 'mental plan', he saw the conflict between the 2 B737s. Had greater attention been paid to his correctly marked strips, this hazardous situation may have been detected earlier. When the conflict was detected, B737(A) was passing FL141, with a climb rate in excess of 3000fpm, and B737(B) was in its 12 o'clock position, range 9.5nm passing FL162 descending to FL150.

The SC instructed the B737(A) pilot to stop climb at FL150, to which the crew replied "*TCAS ????? er c/s say again*". The SC replied "*..avoiding action stop climb immediately please*". At 0823:50, the SC transmitted "*[B737(B)] c/s, avoiding action stop descent immediately please, traffic 12 o'clock same level*" and, 7 secs later, STCA activated. Due to a high ROC, B737(A) was unable to level at FL150 and at 0824:10, when the Mode C readout of B737(A) was indicating FL153 and that of B737(B) FL155, the SC transmitted "*[B737(B)] c/s climb immediately*". The STCA turned from white to red and both crews reported responding to TCAS RAs. STCA changed back to white at 0824:21 and stopped at 0824:30.

Separation reduced to a minimum at 0824:13, when B737(A) was descending through FL151 and B737(B) was climbing through FL156 in its 12 o'clock at a range of 2.4nm. SMF [UKAB Note: Separation Monitoring Function] was not activated because, marginally, neither the lateral nor vertical parameters were infringed simultaneously. Once the ac had passed, and the conflict had been resolved, the crew of B737(A) advised the SC: "*...as you called us level at 15 we got the TCAS warning and I couldn't hear you*".

The SC said that he had not considered turning either ac in order to resolve the conflict. His view was that given the closing speeds of the ac, together with the rapidly decreasing distance between them, any turn instructions given as avoiding action could not have been initiated by the crews, prior to the ac passing each other. He also stated that he had not practised avoiding action scenarios during his recent TRUCE training but had discussed them in 'table top discussions'. He added that he does not believe the recent changes to the avoiding action phraseology are of benefit. He considers the primary need is to pass

the executive instruction as soon as possible and by repeating the c/s twice, as the new phraseology requires, valuable time is lost.

UKAB Note (1): Analysis of the Heathrow (23cm) radar data recording reveals both ac maintaining steady tracks throughout the encounter. CPA occurs at 0824:13 when, as one ac descends and the other climbs, they are vertically separated by 500ft with about 7 secs to go before they pass port-to-port with less than 1nm lateral 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 recording, reports from the air traffic controller involved and the appropriate ATC authority.

Discussion centred on the plan devised by the LTCC SE SC. In outline, an ATC member from LTCC explained, the plan was standard and sound to the point where the SC inexplicably

cleared B737(A) to FL170. Having made what would appear to have been an inadvertent error, it was evident that the SC's incomplete mental picture on this occasion resulted in late detection of the conflict, which should have been evident from the correctly marked strip display. His belated attempt to resolve the situation was frustrated by the ROC of B737(A) and was, in the event, opposite to the vertical resolution determined initially by TCAS. The subsequent reduction in ROC by B737(A), in compliance with the SC's avoiding action, led to TCAS RA reversal, which eventually resolved the situation. This resolution, coupled with the fact that SMF was not activated, convinced the Board that there was no risk of collision.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The LTCC SE SC climbed B737(A) above the level he intended and into conflict with B737(B).

Degree of Risk: C

AIRPROX REPORT No 129/02.

AIRPROX REPORT NO 129/02

Date/Time: 24 Jul 1350

Position: 5335N 0021W (Overhead
Humberside Airport - threshold elev
RW21 74ft; A/D elev 122ft)

Airspace: Humberside ATZ (Class: G)

Reporting Aircraft Reported Aircraft

Type: BE76 Duchess Tucano

Operator: Civ Trng HQ PTC

Alt/FL: 1250ft↑ 2000ft↓
(QNH 1015mb) (QFE 1013 mb)

Weather VMC CLBC VMC

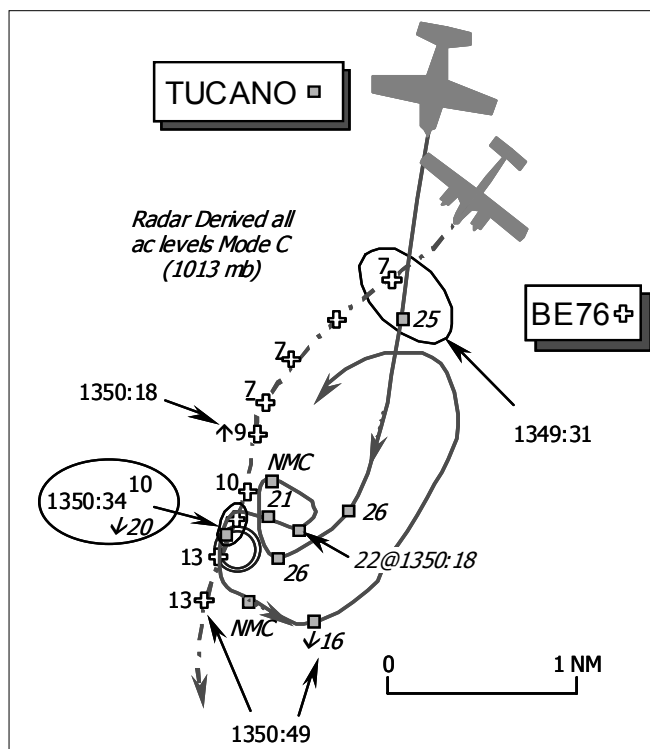
Visibility: 10km+ >10km

Reported Separation:

300m H, 500ft V ¼nm H, 500ft V

Recorded Separation:

Contacts merged



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BEECH 76 DUCHESS PILOT, a flying instructor based at Humberside, reported that his ac has a cream/red livery and HISLs were on whilst conducting a commercial training flight at Humberside for the purpose of obtaining an instrument rating. Instrument flying screens were in place in the cockpit for the student pilot. They were flying under a RIS from Humberside RADAR on 119.125MHz and the assigned squawk of A4266 was selected with Mode C; TCAS is not fitted.

His student was flying an NDB/DME procedure to RW21 and descending on the Final Approach Track (FAT) heading 210° at 90 kt. They were aware that a military ac – the subject Tucano – had called Humberside on the same frequency with a 'PRACTICE PAN' diversion, from a position about 2nm N of Hull and was flying toward the Humberside overhead. Subsequently, the Tucano crew called again for a DF steer to the airfield (QDM) and was given 210° or so and cleared to the overhead – he thought at the time not below 2000ft - although he was subsequently

advised by ATC later that it was 2500ft. He had advised ATC earlier that he intended to carry out an engine failure after take-off (EFATO) drill in the climb out - typically commencing around 1100ft QNH and they had been cleared by RADAR to continue the approach to a height not below 400ft above the runway and then straight ahead to an altitude of 2000ft Humberside QNH (1015mb). The student PF did not fly a particularly accurate approach, which necessitated 'going-around' earlier than the Missed Approach Point (MAPt) [UKAB Note (1): The MAPt is the KIM NDB(L)] from around 600ft QNH, about 0.5nm DME and slightly R of the FAT. The ac ended up in a correct position overhead the airfield in a 5° nose-up climbing attitude at 90kt, but they had not made an early 'go-around' call to ATC as yet because of other RT traffic and a high cockpit workload. At this point he observed a Tucano slightly above his ac at L 11 o'clock as it was crossing 300m ahead of their flightpath R – L, descending in a shallow L turn 500ft above his ac. He took control of the ac from the student but it was too late for any avoiding action (there had not been any time to

effect it and in fact it was probably not required), he asked the student to observe the Tucano, who reported some 7sec later that it was level with their ac at about 10 o'clock. He then called ATC, initially to report an MOR but subsequently upgraded that to an Airprox. He added that they had been advised by ATC, about the Tucano in the vicinity and been looking out accordingly but he thought that the Tucano crew had his ac in sight, whereas the Tucano approached in his blind spot astern of the BE76. He was not able to assess the risk, but cited the high workload in the 'go-around' cleaning up the ac, preparing for the EFATO and the IF screens all as relevant factors.

[UKAB Note (2): Additionally, the BE76b pilot raised some operating points that are more appropriately matters for Humberside Airport and ATC management but are included at annex.]

THE TUCANO PILOT, a QFI, reports his ac has a black colour scheme and the HISL was on, whilst his student, flying the ac from the front seat, completed a visual PFL at Humberside. He was in communication with Humberside TOWER on 118.55MHz and although assigned a squawk of A4276, SSR including Mode C was selected to standby. Neither TCAS nor any other form of CWS is fitted.

They first saw the BE76 as they joined Humberside's overhead at 2500ft QFE (1013mb) for a visual PFL. The Beech was on final approach to RW21 about 3nm ahead and 1000ft below his ac. After calling visual with the field they switched from RADAR to TOWER, who cleared them to carry out a visual PFL and gave them the option to call L or R 'BASE' for RW21 as required [UKAB Note (2): RW21 is a LHD Cct]. An orbit was then flown at 2500ft to reduce speed to 115kt, during which he re-acquired the Beech visually. The student PF then left 'HIGH KEY' (dead side position into wind abeam the threshold at 2500ft) and entered a descending L turn to 'LOW KEY' (down wind position abeam the threshold at 1500ft). The Beech was seen overflying the RW21 threshold 500ft below and ¼nm away by both he and his student as they crossed over RW21 turning through 120°. He assessed the risk of a collision as "nil"

UKAB Note (3): The 1350UTC Humberside METAR gave a Surface wind: 270/6kt; Visibility:

>10km; Cloud: FEW at 1500ft, SCT at 2500ft; QNH: 1015mb.

ATSI reports that RW21 was in use at Humberside for instrument traffic and that the BE76 pilot was in communication with the Humberside Approach RADAR controller (APR); TOWER was manned by a trainee ADC supervised by a mentor. In the period leading up to the incident the APR described his workload level as medium, building to heavy, dealing with VFR flights operating locally, VFR departures, military traffic within the LFS, and the locally based BE76, involving both NDB and ILS approaches to RW21. The BE76 was being provided with a RIS and had been allocated a Humberside discrete SSR code of A4266.

At 1342, the BE76 was at 3000ft ALT, 'beacon outbound' and APR cleared the flight for descent on the procedure on the Humberside QNH (1015mb). The controller advised that climb out instructions would be given later to which the BE76 instructor responded "...I'll be pulling an engine failure drill in the initial climb out", which was acknowledged. By 1346, the BE76 was turning L inbound, at about 7.5nm from the airfield indicating 1500ft Mode C (1013mb). Moments later the Tucano pilot free-called on frequency with a "PRACTICE PAN", reporting her position as just to the N of Kingston-upon-Hull adding "...2500 feet simulated bird strike request route to you for the overhead". The APR identified the Tucano from its assigned SSR code and placed it under a RIS adding, "...not below 2500 ft please traffic on the instrument approach at five miles final...for (runway) 21 route into the overhead QFE for 21 is 1013". Using the intercom facility, the APR immediately informed the ADC of the Tucano's details and intentions, including the assigned SSR code of A4276 (enabling the ADC to track the flight on the Aerodrome Traffic Monitor (ATM). (ATSI Note: Deskside recordings show that the intercom facility between APR and ADC remained open for the next 30 seconds or so, allowing RTF exchanges to be overheard by each party during this period). At that stage the BE76 was indicating 1800ft Mode C about 5nm ahead of the Tucano. A 'steer' was then given by the APR to the Tucano pilot who was then asked to clarify details of the practice emergency. Her reply requested first to manoeuvre in the overhead, for a low speed handling check, then to carry out a practice forced landing (PFL) followed by an

AIRPROX REPORT No 129/02.

overshoot. Humberside ATC staff said that PRACTICE PAN RT exercises there were not uncommon, but accompanying PFLs were relatively rare. Acceptance was, nevertheless, at the discretion of the controller concerned and on that day, when both the APR and the ADC were already busy, accepting the PFL, with the briefest of warning was probably unwise.

Nevertheless, APR asked the Tucano crew to report the field in sight and issued further traffic information on the BE76, "*...12 o'clock range of three miles inbound is instrument approach traffic descending out of 1700 feet*", but omitting the ac type and the crew's intention to go-around after completing the NDB/DME approach. The Tucano student duly reported the field in sight, but did not acknowledge the traffic information, or mention the BE76; these issues were not pursued by the controller. Returning his attention to the BE76, the APR obtained a clearance from the ADC for the flight to 'go-around' on RW21 not below 400ft, which at 1348:30, was relayed to the crew, followed by instructions to climb straight ahead to 2000ft QNH. The controller then co-ordinated the transfer of the Tucano to the ADC, asking the latter if he was happy to accept the flight "*...over the top of...(the BE76)*", to which the ADC agreed. Although the Tucano was faster than the BE76 and likely to overtake it, APR did not provide traffic information to the BE76 pilot about its position or intentions - as could have been expected under a RIS. Instead APR informed the Tucano crew that they were "*...just passing overhead instrument traffic descending out of 1300 feet...*", adding that "*...you can descend down to 2000 feet in the overhead report the field in sight*". The Tucano crew acknowledged and reported the field was in sight, adding "*...remaining at 2500 feet*". Again, the Tucano crew did not mention they had the BE76 in sight. When the Tucano was transferred to TOWER at 1349, the BE76 was ½nm ahead at 2.5nm 'FINALS', L of the centreline closing, indicating 900ft Mode C - some 1700ft below the Tucano. Moments later the Tucano pilot reported to TOWER "*...in the overhead two thousand five hundred feet for low speed handling check*", which was acknowledged. At 1349:31, the Tucano - indicating 2500ft Mode C - overflew the BE76 - indicating 700ft Mode C - at about 1.5nm finals. Still no traffic information about the Tucano was passed to the BE76 crew by the APR.

The incident took place after the Tucano crew commenced their descent from 2500ft for their PFL towards the path of the BE76, which was carrying out a missed approach (M/App), climbing to 2000ft QNH. Having cleared the Tucano to join "*...report er downwind left or right QFE 1013*", the ADC did not update the traffic information on the BE76 or enquire whether the Tucano pilot could see it, less than 1nm from touchdown, N of the centreline, indicating 700ft Mode C. This was the lowest indicated level that the BE76 descended to before commencing the climb on the 'go-around'.

TOWER had approved the PFL in the belief that the Tucano crew had been informed of the BE76's intentions by the APR, and, keeping it in sight, would maintain their own 'separation'. The RT and intercom recordings revealed no indication that such understanding had been reached with the APR. It seems likely, therefore, that TOWER had overheard some or part of APR's RTF transmissions via the open intercom earlier and had drawn incorrect conclusions. Nevertheless, he did not seek to confirm the situation, as he understood it, with the Tucano crew before approving the PFL even though both ac were out of sight, overhead the Control Tower at the time. Less than a minute after the PFL was approved, the pilot of the BE76 reported the Airprox to the APR who responded "*roger that was visually...visual circuit..that was a practice pan Tucano inbound*".

[UKAB Note (4): The radar recording shows the Tucano taking up a tight RHD orbit in the vicinity of the aerodrome at 2600 ft Mode C (1013mb) – about 2660ft QNH - initially, before reversing L and commencing a descent. At 1350:18, the Tucano is shown passing 2200ft Mode C (2260ft QNH) and closing in the BE76 crew's 11 o'clock position, the latter now passing 900 ft Mode C - about 960ft QNH - in the climb. The two radar returns merge at 1350:34, the Tucano descending through 2000ft Mode C (2060ft ALT) and the BE76 climbing through 1000ft Mode C (1060ft QNH). The next discernible indication shows the BE76 climbing through 1300ft Mode C (1360ft QNH) with the Tucano once again in its 11 o'clock position at about 0.3nm, but unfortunately the latter shows NMC. By 1350:49, the Tucano is shown descending through 1600ft (1660ft QNH) some 300ft above the BE76 at 1300ft Mode C (1360ft QNH) - now in the BE76's 9 o'clock at about 0.6nm. Thereafter, the respective tracks

diverge, as the Tucano continues LHD downwind and the BE76 continues its climb-out straight ahead.]

Since this incident, Unit management has issued a local ATS Standards Bulletin in which it highlights the potential for conflict between ac carrying out a M/App and an ac wishing to conduct a PFL. It states the need to ensure that:

“Aircraft are not released for a PFL until the controller is sure that the M/App aircraft is clear of the overhead and does not present a conflict to the PFL aircraft. Remember that the M/App may well start before the M/App point. Also, an aircraft whose intention is to land from an instrument approach may carry out a M/App. Traffic information must be passed to both aircraft and updated as required”.

The Humberside Manager ATC reports that there is currently an open dialogue between ATC and the BE76 pilot.

THE TUCANO PILOT’S UNIT comments that the purpose of an IF safety pilot is for these exact situations. The BE76 pilot acknowledged that avoiding action was not necessary; the Tucano crew had the other ac in sight throughout the incident. This is a salient reminder to all crews when conducting instrument training that the role of the safety pilot is vital, especially in the circuit area.

HQ PTC comments that this encounter again exemplifies the blurred area, which exists where VFR and IFR traffic must integrate into the visual circuit. Each seems to have been fixed on their respective exercises to the exclusion of the other. The BE76 pilot might not be familiar with the variable profile of the Tucano PFL and been surprised to encounter it crosswind during a tricky stage in his go-around. The separation between the ac would have been regarded as fairly routine at Linton.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available to the UKAB 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 concurred with ATSI's report and recognised that the APR did not establish if the Tucano crew could see the IFR BE76 before switching the flight to TOWER, nor advise that the BE76 was about to conduct a go-around with a climb to 2000ft QNH on a M/App. The controller did not receive acknowledgements of the traffic information that he provided to the Tucano crew, whereas none was passed to the BE76 about the Tucano's position or its crew's intentions. Clearly the BE76 crew was entitled to receive such information under the RIS that he had requested and it should have been provided during the approach.

Here the Tucano crew, descending VFR into the visual Cct was required to separate their ac from the BE76, which was executing an IFR procedure – the VMC conditions enabled the safety pilot to acquire the Tucano visually when it crossed their track 500 ft above them. But to enable the Tucano crew to take safe separation it was incumbent on Humberside ATC, who were aware of all that was going on, to provide information about the BE76 and importantly its instructor's intention to execute a M/App. Neither the APR nor ADC complied with this requirement. Humberside TOWER had approved the PFL for the Tucano in the mistaken belief that its crew was fully aware of the BE76 crew's intentions, would keep it in sight and thus would be able to maintain their own separation. Despite ATC's omission of traffic information which should have been provided to both crews, fortunately the Tucano crew had been visual with the BE76 throughout and had taken it into account when executing the PFL. In the Board's opinion, the BE76 had been afforded appropriate separation by the Tucano crew; the radar recording showed that the Tucano was 1000 ft above the BE76 as the agile training ac overtook the slightly slower BE76 and was about 600yd away and diverging when the BE76 instructor safety pilot saw it at 11 o'clock - apparently 500ft above him - though the vertical separation could not be confirmed at this point. Whilst recognising the BE76 pilot's concern at not being told about the Tucano, and ATC's errors of omission, the Board agreed that no conflict had existed and that this occurrence amounted to an unexpected sighting of the Tucano by the BE76 pilot where no

AIRPROX REPORT No 129/02.

risk of a collision had existed in the circumstances that pertained.

In view of the concerns expressed by the BE76 pilot on several local issues, the Board was reassured by the apparent ongoing discussion between ATC and the pilot.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Sighting report.

Degree of Risk: C.

Annex to 129/02

Additional points raised by the BE76 pilot were as follows:

The “wisdom” of ATC routeing a faster ac from their 6 o’clock “blind spot” position to actually cross their intended flight path, when they already had a clearance for an instrument approach and climb straight ahead to 2000 ft QNH.

Though the weather was not a particular factor in this incident, given the actual traffic situation a RAS should have been offered by ATC. Where radar cover is available, a RAS should be the norm or even mandatory for any ac following an instrument approach procedure. This situation seems to be a ‘grey area’ with neither pilots on the one hand, nor ATC on the other, clearly understanding the situation from each other’s point of view.

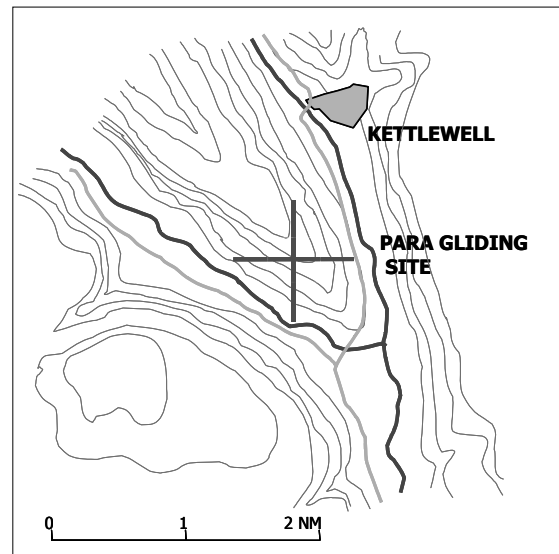
It seems to be the norm at Humberside, for ATC to afford almost immediate accessibility for military traffic, despite an already established situation with other traffic – here when already cleared for an instrument approach – or on some occasions when actually broken off from an instrument procedure.

The advisability of mixing civil and military ac at a civil aerodrome each executing procedures/ manoeuvres, about which, other pilots have not full or adequate knowledge of what might be normal practice for the other.

AIRPROX REPORT NO 130/02

Date/Time: 27 Jul 1430 (Saturday)
Position: 5408 N 0203 W (1½ nm S of Kettlewell, Yorkshire)
Airspace: FIR (Class: G)
Reporting Aircraft *Reported Aircraft*
Type: Paraglider Light Helo
Operator: Civ Pte NK
Alt/FL: 100ft AGL NK

Weather CLOC NR
Visibility: NR NR
Reported Separation:
 < 500ft H, Nil V
Recorded Separation:
 Not recorded

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

THE PARAGLIDER PILOT reports that he was one of several paraglider pilots engaged in ridge soaring. Although he was not airborne at the time of the reported Airprox, 5 others were and he was preparing to launch when he saw the event. There was a light south westerly wind and the pilot reports that the paragliders were at or just above hilltop height. A small helicopter was first heard behind the hill and then seen, heading about 290°, as it appeared from the Kettlewell side of the hill. The helicopter “flew out through the lift band”, passing within an estimated 500ft of the paragliders with no vertical separation. The helicopter, which was described as white and possibly a 2-seater, was thought to have crossed the ridge at about 100-150ft. The pilot stated that the Paragliding site appears on aeronautical charts.

AIS (MIL) report that despite extensive tracing action they have been unable to ascertain the identity of the reported helicopter. None of the recorded LATCC radars illustrate this encounter. In the absence of recorded radar data, all aerodromes in the vicinity that operate such helicopters were contacted during procedural tracing action. The helicopter could not be linked to any known movements, so owners of helicopters matching the description were contacted individually, but again without result.

UKAB Note(1): Tracing action was terminated by the UKAB on 8 Nov 02. Exceptionally, therefore, the reported helicopter remains untraced.

UKAB Note (2): Although the Paragliding site is shown on Military Low Flying Charts, current versions of Civil charts do not show it, carrying the following note: “Symbols depicting Non Winch Launch Hang/Paragliding sites have been removed as they were not an accurate representation of the activity on any given day. Airspace users should be aware that single or groups of soaring or motorised Hang/Paragliders can be found flying anywhere in the open FIR up to 15,000ft”.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted only of the reporting pilot's report.

HQ STC Operations Support (Low Flying) notified the meeting that a new trial system for hang gliding sites was to be introduced in April 03. The system would allow pilots to notify the Low Flying Booking Cell regarding the use of particular sites on the day prior to use. The sites, from a selection of approximately the busiest 100 or so in the

AIRPROX REPORT No 131/02.

country, would then be promulgated as avoidance areas for military traffic. They would be afforded an avoidance area with a diameter of 1nm up to 1000ft agl. Clearly this would not stop other sites being used but it is believed that the new system would offer increased protection to the busiest areas.

The Board observed that, under current arrangements, the possibility of encountering paragliders anywhere in the open FIR should be borne in mind by all airspace users, particularly those operating in hilly areas at weekends. Equally, paraglider pilots should not believe that their site is protected or even notified to other airspace users. The Board felt that paraglider pilots could consider whether they are optimising their chances of being seen, in terms of canopy colours and the possible carriage of lightweight lighting, particularly in poorer conditions. It is likely that the helicopter pilot had reduced his chances of seeing the paragliders by "clipping" the ridges, and this was not wise practice.

This report is unusual in that it was not submitted by one of the pilots concerned. Although the reporting pilot was about to launch, he was effectively an observer to the event and his report must be read with this in mind. Had the airborne pilots involved been concerned for their safety, the Board reasoned that one of them should have submitted the Airprox. The lack of an airborne pilot's report and the absence of a report from the helicopter lead the Board to conclude that, although the helicopter had obviously caused concern, there was insufficient information available to assess the degree of risk.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: An unidentified helicopter flew close enough to the paragliders to cause concern to an observer on the ground.

Degree of Risk: D

AIRPROX REPORT NO 131/02

Date/Time: 30 Jul 1223

Position: 5325N 0312W (3nm W WAL)

Airspace: CTA L975 (Class: A)

Reporting Aircraft Reported Aircraft

Type: BA46 E135

Operator: CAT CAT

Alt/FL: FL200 ↓FL170

Weather IMC KLWD IMC KLWD

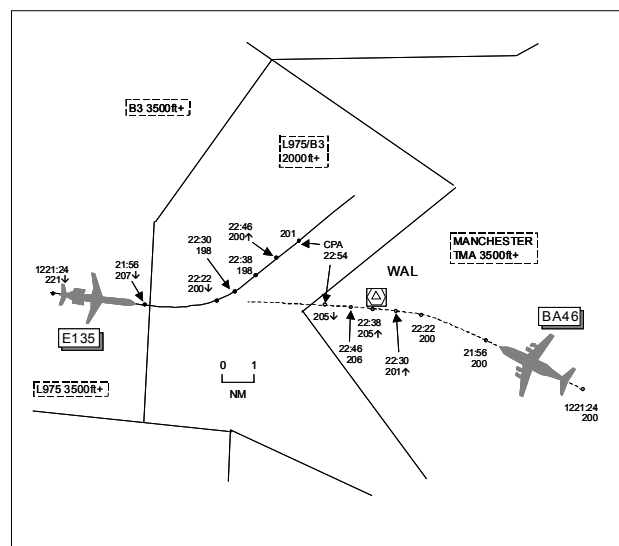
Visibility: NK NK

Reported Separation:

0ft V NK H 800ft V 2.75nm H

Recorded Separation:

400ft V 2.6nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BA46 PILOT reports cruising at FL200 and 280kt routing WAL to KELLY whilst in receipt of an ATC service from MACC on 128.05MHz. ATC issued a heading change onto 270° - a 30° L turn

- and on steadying up he received a TCAS TA on traffic in his 12 o'clock 300ft above and descending. Shortly thereafter TCAS gave an RA "climb" which he commenced but TCAS quickly

gave "*clear of conflict*" after 2-3 sec. He reduced the ROC and commenced a recovery to his cleared level; max level gain was 600ft and ATC were advised of the TCAS manoeuvre. He assessed the risk of collision as high.

THE E135 PILOT reports heading 060° en route to Leeds at 300kt whilst in receipt of an ATC service from MACC on 128.05MHz. Whilst descending from FL240 to FL170 at 2500fpm, ATC asked him to expedite descent so he set ROD at 3000fpm. He then received a TCAS TA followed almost immediately by an RA "*descend, descend now*" by which time he was descending through FL205. The ROD was now estimated to be 5000fpm with TCAS showing traffic at 12 o'clock 200ft below moving L to R; the traffic indicated clear when at FL190. Once clear of the conflicting traffic, the ac's speed ballooned the ac back to approx FL200.

ATSI reports that the SC was operating with a trainee, who had completed about two hundred hours training but had no previous operational experience; they had been in position for about one hour prior to the incident. He commented that the workload had been high for most of the session but had started to decrease when the Airprox occurred.

The E135 established communication with the MACC West Sector at 1216, reporting descending to FL240, to be level 45nm before WAL, on a radar heading of 105°. The call was answered by the trainee, who instructed the flight to continue on its heading. The mentor explained that, normally, he would have issued descent clearance to the E135 at this time, as this would have ensured that the flight would have remained clear of MACC Sector 29 airspace, the base of which is FL195, just to the W of WAL. However, with the intention of prompting his trainee at a later stage to initiate descent if not previously forthcoming, he allowed the ac to continue at FL240. He then turned his attention to the traffic situation elsewhere in the sector.

It was not until about four minutes afterwards, somewhat later than intended, that the mentor prompted his trainee to issue descent clearance to the E135; it was about 25nm from WAL at the time. In accordance with the acceptance level agreed with the MACC Ribble Sector, the E135 was cleared to descend to FL170, with the added

instruction to expedite descent through FL190. The mentor explained that, as the E135 was higher than he had planned, he asked the Co-ordinator to inform Sector 29 that it might enter that sector's airspace. The mentor said that he prompted his trainee to pass the expeditious descent through FL190 because he was aware that the BA46 was routeing opposite direction at FL200. The radar timed at 1220:10, when descent clearance was issued to the E135, shows the subject ac 36.9nm apart and subsequently reveals that the flight descended at an average ROD of 3000fpm.

The BA46 pilot made his initial call on the West Sector frequency at 1221:30 and reported maintaining FL200 on course to WAL. The mentor commented that, being aware of the situation between the subject ac, he thought that Sector 29 might transfer the BA46 on a heading to take it clear of the E135. However, he admitted that he had not made any request to that effect. The trainee passed the BA46's routeing as WAL, then KELLY. The mentor said that he realised that the situation, between the subject ac, was tight but still believed that vertical separation would be achieved before lateral separation reduced below the requisite 5nm. However, to widen the distance between the ac, he prompted his trainee to instruct the BA46 to fly a heading of 270° and the E135 to turn L heading 060°. Additionally, the latter was asked to increase its ROD through FL190. The pilot of the E135 responded "*increasing our rate*". The radar recording at 1221:56 shows the E135 passing FL207, with the BA46, in its twelve o'clock, 12.8nm away. However, instead of increasing its descent the E135 started to level off as it approached FL200. It was at this time, 1222:20, that the BA46 reported a TCAS climb. Shortly afterwards (1222:30), the E135 transmitted "*...that's a TCAS descent now clear of conflict*". The E135 was now at FL198, 6nm from the BA46, but, almost immediately, it commenced climbing, reaching FL201 before descending again. At this point, minimum separation occurred (1222:54) i.e. 2.6nm/400ft, but by this time the ac were on diverging tracks, having responded to ATC heading instructions. TI was not passed to either flight throughout the incident.

In the circumstances, where the two ac were closing quickly on opposite direction tracks, it would have been prudent to ensure that horizontal

AIRPROX REPORT No 131/02.

separation existed before dispensing with vertical. Nevertheless, the controller could have expected the pilot of the E135 to have expedited his descent, as requested, thereby reducing the potential for conflict.

THE E135's FLIGHT SAFETY DEPT reports that the ac's DFDR was downloaded post flight and the crew were interviewed. The ac was descending in accordance with ATC instructions but the conditions were very turbulent. When requested by ATC, the vertical speed was increased by adjustment of the v/s knob on the Guidance Control Panel (GCP). The ergonomics of this panel does leave a little to be desired for it is possible to select the wrong knob or button especially in turbulent or high stress conditions. The DFDR does show an initial increase in selected v/s followed by a selection of Altitude hold, alt hold lasts for 11 sec which would explain the level off at FL200 but the crew did not remember this. When the RA was received, this was quickly actioned by the PF by disconnecting the A/P using the Touch Control Steering (TCS) button. This allows manual control inputs without disconnecting the A/P, however there is no auto trim function and it is difficult to manually trim the ac when the TCS button is depressed. Trimming would have to be done using the backup trim switches, which are rarely used, positioned down to the side of both pilots on the central quadrant. It is possible that trimming was carried out this way but may have been done in the incorrect sense as the DFDR indicates trimming in the negative sense i.e. trimming nose-up. This does correlate with the climb back up to FL202 from FL200 after the RA but again the crew had no recollection of this post incident. The PNF noticed the climb and informed the PF who corrected the situation and recommenced the descent.

The Company have reviewed the Operations Manual with the aim being to ensure that the monitoring function is more robust and that there is positive confirmation of action being taken; this also guards against incapacitation. The TCS button will not be used and the A/P will always be disconnected. It could be argued that in some cases the A/P should be left in but this has not been allowed for in the event of an RA.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members were familiar with the 'on the job' training scenario, knowing well the fine balance to be struck by the mentor between allowing the trainee to continue 'in control' rather than taking over too early, to the detriment of the trainee's confidence. The mentor had been well aware of the potential conflict between the subject ac but he had allowed his trainee to continue, apparently confident that the trainee could sort out the traffic situation and, if not, that he could. Ultimately, the mentor took action, by prompting through the trainee, but by this stage he was reliant on the subject ac's performance to resolve the conflict. By not putting the ac on headings at an earlier stage, to ensure horizontal separation before dispensing with vertical separation, the deteriorating situation had led to the need to 'expedite' the E135's descent profile to resolve matters, and this had been a part cause of the Airprox. Unfortunately, the hoped for resolution was not helped by the E135 crew's actions. After acknowledging the instruction to expedite descent through FL190 for FL170 and agreeing to ATC's subsequent request to increase their ROD, they had mistakenly selected 'Alt Hold' which had not only arrested their descent profile but had caused the ac to climb slightly before the crew recommenced their descent. This had exacerbated an already 'tight' scenario, where vertical separation probably would just have been achieved if the ac had continued descending at its previous ROD. Members agreed that the unintended actions by the E135 crew had compounded the situation and this had been a further part cause to the Airprox.

Turning to risk, the Radar Controller had turned both ac onto diverging tracks as well as asking the E135 crew to increase their ROD. The BA46 crew had received a TA then RA '*climb*' after they had been turned onto 270° and had reacted promptly

by following its guidance. The E135 crew had received a TA then RA "descend" and had already executed a L turn onto 060° as their descent was arrested. Both TCAS alerts had occurred after the subject acs' projected tracks had crossed and were diverging. Although singly untidy, all of these elements combined were enough to persuade the Board that any risk of collision had been effectively removed.

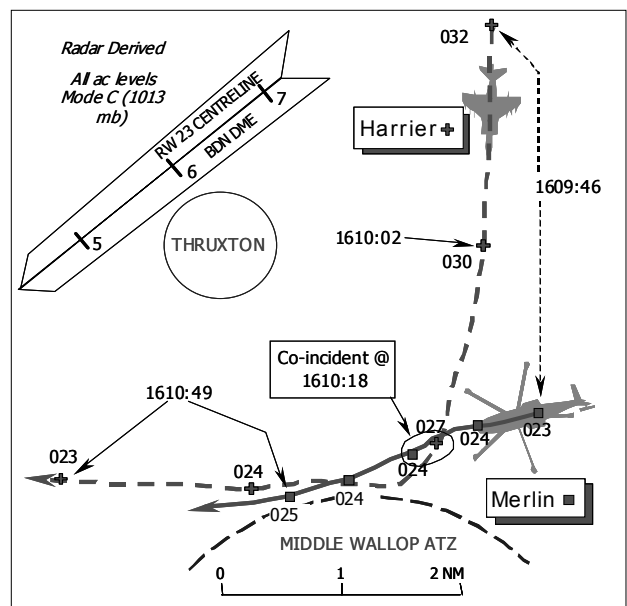
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The MACC West Radar Controller Mentor dispensed with vertical separation without ensuring horizontal separation, compounded by the E135 crew's actions, which reversed their descent.

Degree of Risk: C

AIRPROX REPORT NO 132/02

Date/Time: 29 Jul 1615
Position: 5110 N 0135 W (8nm E of Boscombe Down - elev 407 ft)
Airspace: (Class: G)
Reporting Aircraft Reported Aircraft
Type: Merlin Harrier GR7
Operator: DPA DPA
Alt/FL: 2200 ft ↓1500ft
 (QFE 1003 mb) (QFE 1003mb)
Weather VMC HAZE VMC CLBC
Visibility: 2.0nm >10km
Reported Separation:
 200yd H, 200ft V ½-1nm H, 500ftV
Recorded Separation:
 300yd H, 2-300ft V



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE MERLIN PILOT reports heading 265° at 130kt and climbing from 1700ft to 2500ft to overfly Boscombe Down airfield. In-flight visibility was assessed to be about 2nm in haze, and the ac was flying into sun. Boscombe ZONE, who were providing a RIS, advised of a Harrier to the north which was joining for long finals to RW23 and, he thought, descending from 3000ft to 2000ft. Looking right, he sighted the Harrier in his 3 o'clock at 1nm and similar height. It was just starting a turn to starboard, and this caused him concern about the acs' flight paths and the possibility of the Harrier pilot losing sight of the helicopter during his turn, particularly in the poor visibility. Although he believed that the Harrier

pilot had seen him, he stopped climbing and prepared for possible avoiding action. He observed the Harrier adjust his turn to pass behind the helicopter, slightly above his own height of 2200ft. He thought that the final separation, assessed as 200yd and 200ft was unnecessarily close as the ac were operating on different frequencies and mutual sighting in the poor visibility was not assured. He assessed the risk as "minor" but observed that it would have been "major" had the Harrier not seen the helicopter. The helicopter was coloured green with HISLs, transponder and Mode C on; TCAS was not fitted.

AIRPROX REPORT No 132/02.

THE HARRIER GR7 PILOT reports that he was recovering to Boscombe Down RW23 in hazy conditions but with an in-flight visibility of more than 10km. He was receiving a RIS from Boscombe Approach (APP), who passed traffic information (TI) on the helicopter to him. He acquired it visually at 2 to 3nm and adjusted his recovery to pass behind rather than turning "belly up" to it. He assessed that he passed about ½-1nm from the helicopter and 500ft above it, offset to his right. He observed in his report that the helicopter was positioned in the approach lane to RW23 at a typical approach height.

UKAB Note (1): The Boscombe Down Met Office weather report at time 1550 gives a visibility of 25km and FEW at 4000 ft, colour state BLUE.

UKAB Note (2): Analysis of the Cleve Hill radar recording shows the Merlin some way to the south of the extended centreline for RW23, tracking for the Boscombe overhead. The Harrier flies through the RW centre line and as it passes the Merlin, the two ac are about 3nm displaced from the centreline to the south. The Harrier passes behind the Merlin with a separation of about 500yd, and then overtakes the Merlin on its port side with a separation of about 300yd. Vertical separation, based on Mode C returns, is 300ft as the Harrier passes behind, and the ac are next seen co-height when the Harrier is about a mile ahead of the Merlin.

THE HARRIER GR7 PILOT'S UNIT comments that the Harrier pilot sighted the Merlin at 2 to 3nm and manoeuvred his ac to maintain visual contact and what he believed to be appropriate separation of ½nm and 500ft. If the helicopter pilot's assessment of separation (200yd, 200ft) is more accurate, this is clearly too close, though it is unlikely that an actual risk of collision ever existed. However, the Harrier was flown sufficiently close to the Merlin for its pilot to be concerned. All unit crews have been reminded of the need to give a sufficiently wide berth to other ac, particularly slow and cumbersome types. The airspace around Boscombe is very busy, with multiple types flying at disparate speeds. As they are often carrying out varying tasks it is quite appropriate for the ac to be on different frequencies though it was regrettable that the Merlin pilot was not told that the Harrier pilot had contact with him and was manoeuvring accordingly. Unfortunately, the speed of events and the workload on both

controllers meant that, whilst appropriate co-ordination was taking place within the ACR, there was no opportunity to pass that information to the Merlin. SATCO Boscombe has been asked to remind controllers that this additional co-ordination should take place when workload allows.

DPA comments that discussions took place with both pilots to try to resolve the different assessments of separation, but these were unsuccessful. ATC gave accurate traffic information on at least two occasions to both pilots, though the Merlin pilot was not told that the Harrier pilot had the Merlin in sight. In view of the busy traffic situation, this omission by the ZONE controller is understandable, but probably contributed to the Merlin pilot's unease and subsequent filing of the Airprox report.

MIL ATC OPS reports that the Merlin pilot was handed to Boscombe Zone (ZONE) from Farnborough under a limited RIS, and requested a transit through the overhead at 2000ft. The Harrier was handed over to Boscombe Down Approach (APP) from Brize Norton for a visual recovery. It was identified, placed under a RIS, and the pilot was passed the airfield details. Shortly afterwards, the Merlin was also passed the airfield details by ZONE and it was established that he would transit the overhead at 2500ft. As the Merlin commenced its climb to 2500ft, ZONE passed TI to APP "*...overhead Andover westbound.....climbing to 2500ft for a MATZ crossing through the overhead....*". In return APP passed ZONE TI "*...traffic north east of Thruxton 10 miles south-west bound.....shortly turning inbound, descending into the field*". At 1609:04 the Harrier was given further descent clearance to 1500ft QFE, and it was established that he did not require vectors to the field. This was followed by TI on the Merlin "*.....12 o'clock, 4 miles, left-right, 2500ft.*" This was re-called 7 seconds later "*.....traffic now 12 o'clock, 2 miles left-right, 300 ft below*" and the Harrier pilot confirmed he was visual. APP then reminded the Harrier pilot of the proximity of Middle Wallop and suggested he "*.....turn right for the airfield 270*". Simultaneously (1609:34) ZONE passed TI on the Harrier to the Merlin "*.....traffic to the north of you range 5 miles, southbound at the moment, inbound to Boscombe shortly turning right for the aerodrome, indicating 3000ft*". Thirty seconds later, ZONE updated the information "*.....right 3*

o'clock, range 1½ miles, Harrier indicating slightly above" to which the Merlin responded "...visual he's turning inside of us....correction behind us....he's going over the top....that was a little too close for comfort, sir".

Both APP and ZONE controllers stated that they did not expect the Harrier to fly south of the extended centreline of RW23, instead expecting it to turn towards the airfield well to the north of the Merlin. When it became clear that the Harrier was continuing on a southerly track, it was again called to the Merlin, and an attempt made to alert Middle Wallop that the Harrier was approaching their ATZ.

The ATC Training Manual regarding Fixed Wing Visual Recoveries at Boscombe states that *".....a/c recovering from the north-east for a RW23 run and break may be positioned or self-position on the rwy centreline at around 5nm"*. There is no defined initial point at Boscombe Down and no deadside. It appears as though both controllers acted in good faith and applied the rules of RIS accurately. On this occasion the Harrier pilot, carrying out an accepted procedure under his own navigation, elected to fly a non standard profile thereby bringing his ac into conflict with the MATZ crossing Merlin.

STC comments that the reported separations between the ac vary considerably. The Harrier reports 'Tally' as APP calls the distance 2nm. The Harrier then takes visual separation on the helo, and this is likely to account for him flying further south in order to avoid going unsighted, and thus to maintain safe visual separation. However, fast-jet pilots need to remember that helicopter crews feel greater vulnerability, and need to be given wide margins of avoidance. If the helo had been informed that the Harrier had him 'Tally' it is likely he would not have been so concerned.

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 adviser explained why the Merlin pilot had not been told that the Harrier pilot was visual with the ac. Once it was realised that the Harrier was proceeding further south than expected, the Approach controller attempted to alert Middle Wallop to the fact, and it was this that prevented the information from being passed to the Zone controller.

The Board agreed that, had the Harrier pilot turned inbound to the airfield when he should have, and when he was expected to, then the Airprox would not have occurred. His reasons for not doing so were discussed, and some pilot members thought that he may have become overly fixed on the helicopter, believing it to be a threat, and had not appreciated quite how far south he was flying. Even if he had realised this before passing the helicopter, it became apparent that to turn belly up was not a good course of action, and that the only option then was to continue further south to ensure that he passed behind, albeit not by a great margin.

Members understood this analysis but suggested that the Harrier pilot should then have declared his intention to fly south of the RW centreline. It is possible that the Harrier pilot was not aware of his precise location at the time, though. This view was supported by the Harrier Pilot's report that the Merlin was in the approach lane for RW23 indicating that he thought the encounter had taken place further north and suggesting that he had, for some reason, an incorrect mental "picture" of the event which persisted until the time of writing the report. However, it was also pointed out that he must have been aware of his position relative to the centreline after he had turned behind the helicopter, as he then took up a westerly heading for the airfield.

Accepting that the Harrier pilot had flown unexpectedly into the Merlin's vicinity, the discussion moved to the Airprox encounter itself. Both pilots had been visual with each other and correct ATC procedures were applied. It was clear that the final separation was largely in the control of the Harrier pilot, who probably did not do enough to ensure that a comfortable separation existed, from the point of view of the Merlin pilot. Nevertheless, there had been no risk of collision in these circumstances.

AIRPROX REPORT No 133/02.

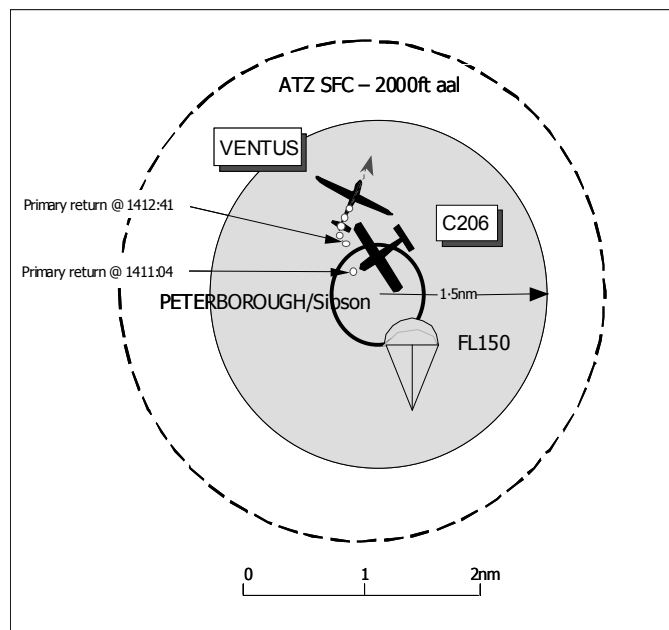
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Harrier pilot flew close enough to the Merlin to cause concern.

Degree of Risk: C

AIRPROX REPORT NO 133/02

Date/Time: 27 Jul 1411 (Saturday)
Position: 5233N 00023W (Overhead Peterborough/Sibson - elev 100ft ft)
Airspace: London FIR (Class: G)
Reporting Aircraft Reported Aircraft
Type: C206 Ventus 2CT
Glider
Operator: Civ Club Civ Pte
Alt/FL: 3500ft 2500ft
(QNH) (Marham QFE 1014mb)
Weather VMC CAVOK VMC CLBC
Visibility: >20km 15km
Reported Separation:
400ft V, nil H Not Seen
Recorded Separation:
NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE C206 PILOT reports that he was heading 240° at 75kt running in overhead the Peterborough/Sibson DZ and in communication with Drop Zone Control on 129.90MHz when he was warned that there was other traffic in the vicinity. The jumpmaster, who was at the open rear door of the ac in preparation for dropping, then reported seeing a glider several hundred ft directly below turning through an approximate reciprocal hdg. The parachute drop was aborted and the C206 commenced a LH orbit until the glider, which was observed to perform at least one 360° turn above Sibson airfield, cleared the area to the N. He adds that his ac was mainly white with dark blue.

THE VENTUS 2CT GLIDER PILOT reports that he was on a cross-country flight from/to Marham and listening out on 130.1MHz, a common glider frequency. He was generally at about 2500ft (Marham QFE) in good VMC with 15km forward visibility and about 1000ft, he thought, below cloud. He tried to call Sibson on 129.90MHz when he saw an airfield S of Peterborough but received no reply. [UKAB Note: UK AIP AD 2-EGSP-1-1 promulgates A/G service, 122.300 Sibson Radio.] Therefore he avoided this airfield. Sometime later he saw that he was over the marked threshold of a grass airfield. Although he was above the ATZ, he immediately flew N as he had no idea which airfield it was. He had previously reviewed his route on a 1:500 000 chart and had noted Sibson as a place to avoid. However, during the flight he

was using a Palm PC with an airspace program that did not identify Sibson as an airfield. Having previously misidentified Peterborough/Conington as Sibson and avoided it, he was surprised to find himself over an "unknown" airfield. He managed to ascertain what he had done when he consulted his 1:500 000 chart after he had climbed near Wittering. He did not, however, see another ac in the vicinity of Sibson. He also reports that his glider was white.

UKAB Note (1): Met Office archive data reveals that the Marham QFE was 1014mb from 1200 to 1459. Based on statistical data from a surface analysis chart, the Peterborough/Sibson 1400 QNH is calculated to have been 1017mb.

UKAB Note (2): Relevant UK AIP entries are as follows:

ENR 1-1-5-7 para 5.4.1 states:

"Intensive free-fall parachuting may be conducted up to FL150 at any of the Drop Zones listed at ENR 5.5 and in several Danger Areas.

ENR 1-1-5-7 para 5.4.3 states:

"Visual sighting of free-falling bodies is virtually impossible and the presence of an aircraft within the Drop Zone may be similarly difficult to detect from the parachutists' point of view. ... Pilots are strongly advised to give a wide berth to all such Drop Zones where parachuting may be taking place."

ENR 5-5-3-2 promulgates the Peterborough/Sibson Free-Fall Drop Zone as:

"Circle 1.5nm radius of 523335N 0002346W. Vertical Limits FL150. Remarks: Activity notified on the day to Cottesmore ATC or London TCC outside hours of Cottesmore. Hours: Normally during daylight hours."

UKAB Note (3): Analysis of the Debden radar recorded data is not conclusive. The C206, squawking 0033 with Mode C appears at 1401:51 climbing on SE track away from the Peterborough/Sibson. At 1404:16, when it displays 011 on Mode C, the C206 commences a L turnabout onto NW.

At 1407:56 the C206 is E abeam Sibson, displaying 024 on Mode C, whilst another ac, with SSR code 7000 and Mode C, is landing at Sibson from the E. The C206 then turns onto a WSW track passing just N of the field. At 1409:55 the C206 turns L onto a reciprocal track continuing the climb reaching 034 on Mode C at 1410:43. It then turns L again back onto a WSW track still indicating 034 on Mode C, followed by a L turn onto reciprocal still indicating 034 on Mode C. At 1411:04 a primary return, possibly that of the reported Ventus glider, appears approximately 0.25nm NW of the estimated Sibson ARP, whilst the C206 is approximately 0.6nm to the SE hdg ENE. It is probable, therefore, that the encounter reported by the C206 had occurred prior to this. Meanwhile the C206 completes 2 LH racetracks over the field with Mode C varying between 034 and 031. At 1412:41 another primary return paints approximately 0.5nm NNW of the airfield. This is followed by a further 4 intermittent, primary returns on a NNE track with the last appearing at 1414:08. At 1416:32, the C206 commences descent on SW track clear of the Sibson overhead.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members had difficulty in determining where, and whose, safety had been compromised in this encounter. Clearly the parachutists would have been at risk had they jumped. However, because Drop Zone Control had alerted the pilot to the presence of traffic, the jumpmaster visually acquired the Ventus glider and prevented the parachutists from leaving the C206. Therefore, two of the safety nets in place worked and prevented an encounter. Nevertheless, by his own admission the Ventus pilot had inadvertently penetrated the Free-Fall Drop Zone contrary to the advice published in the UK AIP. A GA pilot member suggested this was the result of the glider pilot's misplaced reliance upon an 'aid to navigation' rather than on navigation. The Board was unanimous in its view that this was a sighting report and that there was no risk of collision.

AIRPROX REPORT No 134/02.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Sighting report.

Degree of Risk: C

AIRPROX REPORT NO 134/02

Date/Time: 3 Aug 1510 (Saturday)

Position: 5130N 0233W (2.5nm ESE Filton - elev 226ft)

Airspace: ATZ (Class: G)

Reporting Aircraft Reported Aircraft

Type: C172 C152

Operator: Civ Pte Civ Pte

Alt/FL: 1500ft NK

(QFE) (QNH)

Weather VMC CLBC VMC CLBC

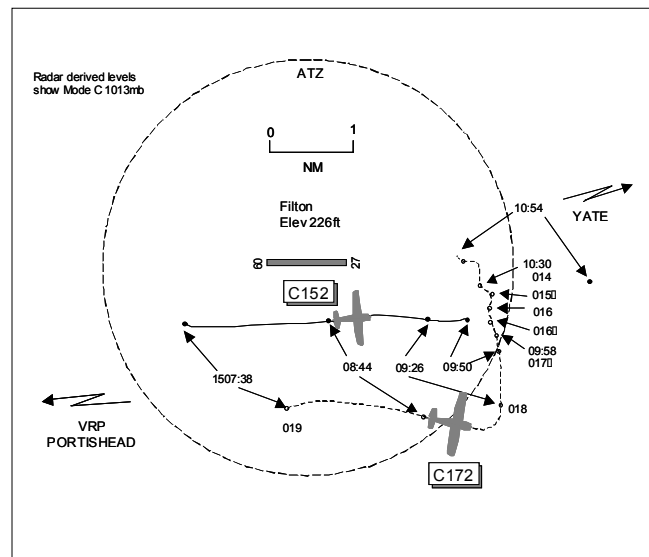
Visibility: 15km >10km

Reported Separation:

25ft H 0 ft V not seen

Recorded Separation:

not recorded



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE C172 PILOT reports flying solo inbound to Filton at 95kt and in receipt of an ATC service from Filton TOWER on 122.72MHz squawking 7000 with Mode C. The visibility was 15km below a scattered cloudbase and the ac was coloured white with blue/red stripes; strobe lights were switched on. About 1.5nm SE of Filton at 1500ft QFE whilst in the turn onto heading 360° to position onto LB RW28 behind a twin engined ac on final, he saw a Cessna ac, coloured white with red stripes, in his 10 o'clock 25-30ft away at the same level tracking approx 100°; the conflicting ac did not appear to alter course or level. He took avoiding action by commencing a steep descending R turn and he assessed the risk of collision as high. Previously, on first contact with Filton TOWER, TI had been passed to him on a light ac which turned R after departure RW27, he thought; he had seen this ac once airborne and had judged it not to be in confliction.

UKAB Note (1): During a subsequent telephone conversation with the reporting pilot, he confirmed that he had seen the departing Cessna passing abeam, when he was downwind, and he had assumed that it was turning R on departure or turning L into the cct behind him. Normally he flies from a military aerodrome and accordingly called 'finals' when he was established on base leg. He was taken by surprise by the conflicting crossing Cessna whilst on base leg, believing it to be a different ac from the one he had seen departing earlier. At this time he had become slightly confused about the geometry of the encounter and he had erroneously stated on the RT that the conflicting ac had been routeing northerly instead of easterly.

THE C152 PILOT reports flying solo outbound from Filton to Old Sarum and in receipt of ATC service from Filton APPROACH, he thought, on 122.72MHz squawking 7000 with NMC, he thought. The visibility was >10km 1000ft below

cloud in VMC and the ac was coloured white with grey/red stripes. He only became aware of the Airprox after being contacted by AIS MIL post tracing action. He had been given take-off clearance from Filton with a L turn out and he had not seen the reporting ac, believing that the incident must have occurred during his climb in the downwind leg position.

UKAB Note (2): The Filton RT transcript shortly after 1504 reveals the C172 pilot's initial RT call to the ADC, when he reports inbound to Filton overhead Portishead at 2000ft. The ADC asks him to report joining downwind LH for RW27; meanwhile the C152 is holding at the Filton RW27 Holding Point awaiting departure. At 1505 the ADC clears the C152 to line up RW27, the pilot reporting, just after 1505:30, "C152 c/s lined up". The ADC replies "C152 c/s roger cleared take off with a left turn wind calm". Approx one min later, the ADC transmits "C152 c/s Flight Information Service er keep a lookout a Cessna One Seven Two South of the airfield to join lefthand downwind"; this was read back correctly. A further one minute later the C172 pilot calls "C172 c/s is downwind two seven land visual er departing traffic". After the controller replies "C172 c/s roger report ready for base", which is acknowledged, he transmits shortly before 1508 "C152 c/s the er inbound Cessna One Seven Two now mid downwind lefthand contact Bristol Radar one two eight decimal five five bye bye". This was not acknowledged so the ADC starts transmitting again "C152 c/s contact Bristol Rad-" but this was clipped and following a part simultaneous transmission it ended with the C152 pilot saying "????? Radar one two eight decimal five five C152 c/s". After an interval of 2:30 min, following the ADC asking the C172 to report final number 2 to a PA31 on six mile final, which is acknowledged, this exchange took place:-

C172 "Have you got an aircraft into the circuit apart from me".

ADC "Er not that I'm aware of".

C172 "Er roger I just missed an aircraft by about fifty foot that's going through your er overhead about one thousand five hundred feet".

ADC "C172 c/s er thanks for that er not speaking to me".

C172 "Roger I'm finals to land and he's northbound".

After the C172 had landed, a further exchange took place between the ADC and the pilot. Following the reporting pilot stating the conflicting ac type was a C152 or 172 coloured white with red markings the ADC transmits "Roger there was the Cessna One Five Two that departed from myself but he was remain remain er correction routeing southbound so er er he shouldn't have been the one that was er infringing with you on base". The C172 pilot replies "Er roger not sure it's definitely was departing north er no heading north C172 c/s". Finally the ADC responds "Roger it couldn't have been him then thanks".

ATSI comments that leaving aside the confusing reports received on the RT from the pilot of the C172 concerning the geography of the incident, it would appear that the Airprox occurred whilst the C172 was on base leg for RW 27 and the C152 was leaving the circuit on an easterly heading. Both acs' pilots were aware of each other's presence.

The Filton ADC warned the C152 pilot, having just departed under a FIS, about the C172 S of the airfield joining LH downwind. Additionally, when the C172 pilot reported downwind, he also made comment about sighting the departing traffic (C152). The ADC passed the C152 pilot further information when the C172 was "mid downwind lefthand" before transferring the flight to Bristol (Lulsgate). Arguably, it would have been prudent to have waited until the C152 had sighted the C172 or they had passed before transferring it. However, as far as the ADC was concerned, the pilot of the C172 was visual with the traffic and the controller had no reason to believe that he would conflict with the C152.

UKAB Note (3): The Filton 1450Z QNH was 1012mb.

UKAB Note (4): The UK AIP at AD2-EGTG-1-8 under Flight Procedures details the Filton visual cct height as 2000ft QFE for Jet/Turbo-prop ac and 1500ft QFE for all other ac.

UKAB Note (5): Analysis of the Clee Hill recorded radar at 1507:38 shows the C172 1.8nm S of Filton LH downwind for RW 27 squawking 7000 indicating 1900ft Mode C as the C152 enters

AIRPROX REPORT No 134/02.

radar cover, as a primary only return, 1.6nm WSW of Filton tracking 090°. The C152 continues on a steady easterly track whilst the C172 turns L to steady on a northerly track at 1509:26 indicating 1800ft Mode C. Both ac continue to converge on steady tracks until the C152 fades from radar at 1509:50 0.55nm NW of the C172. Over the course of the next 5 radar sweeps, the C172 is seen to deviate L and R of the northerly track and to descend to FL014. However the Airprox is not seen on recorded radar, as the C152 only reappears at 1510:54 3.4nm E of Filton whilst the C172 is by 1.6nm to its W on final approach to RW27.

UKAB Note (6): The Bristol (Lulsgate) LARS controller in his CA1261 states that after transferring the C172 to Filton about 3nm to their SW at 1503, the C152 called 7 min later routeing from Filton to Old Sarum via Yate and Bath VFR. There was no traffic to affect the Cessna and he was only made aware of the incident when he was informed about 1 hr later.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members wondered how the subject ac, both flying in an ATZ and receiving an ADC service, could have flown into such close proximity. The recorded radar shows that the C152 had flown close to the RW after departure tracking E, about 1nm 'inside' the C172, whilst routeing towards Yate. The ADC appears to have been unaware of the C152's departure track and had assumed the C152 departed to the S for Old Sarum as revealed during her RT exchange with the C172 pilot. ATC had released the C152 and despite passing TI twice on the joining C172, the C152 pilot had not seen the joining ac at all. Although the C152 pilot had changed frequency as instructed, the onus was on him to 'see and avoid' other traffic already established in the cct pattern. Arguably, he may have thought that the C172 would be well ahead of him by the time he transited the base-leg area to the E of Filton, or he may not have been cognisant that the C172 would be flying at a

higher level in that area owing to the non-standard Filton cct height, or extending its pattern to position in traffic. Also, flying solo from the LH seat in a nose up climbing attitude, the C152 pilot's view cross-cockpit to the R would have been degraded, although this should have routinely been taken into account during his lookout scan as a matter of course. Additionally, he may have been concentrating his attention on his initial departure track towards Yate which is 7 nm ENE of Filton, N of the RW 27 FAT. However, for whatever reason, he had not seen the C172 at all and this had been a part cause of the Airprox. Conversely, the C172 had flown a wide cct when joining downwind, possibly owing to its pilot trying to retain the correct visual perspective of his position relative to the wide RW when flying at the 1500ft cct height. Also, the pilot appeared to have extended his downwind leg whilst attempting to comply with an ATC instruction to position No 2 to a PA31 on a straight in approach for RW 27. By flying this wide cct pattern, the C172 had flown outside the ATZ, albeit briefly, during his turn from downwind onto a wide base-leg position. Members agreed that this wide cct had contributed to the Airprox and had placed the C172 into conflict with the departing C152. The C172 pilot had reported 'downwind' and sighting the departing C152 when it was airborne RW 27, but apparently then dismissed its presence, erroneously assuming it to be turning R and out of conflict or L to pass behind. However, the ATC take-off clearance to the C152 pilot to depart with a L turn out had been broadcast prior to C172 pilot's downwind call which should have alerted him at least in part to its intentions. The C172 pilot had then been taken by 'surprise' when he saw another Cessna very late on the downwind leg whilst he was established on base leg; this too had been a part cause of the Airprox.

Turning to risk, the C152 had departed VFR, intending to climb through the cct, which had placed the onus on its pilot to see and avoid the C172 which he had not done, despite TI from ATC. The C172 pilot had seen the C152 very late in his 10 o'clock, he thought 20-30ft away, at the same level and had commenced a diving R turn to avoid. Some members questioned the sighting distance, believing that 30ft allowed no time to take avoiding action. However, it was agreed that although the C172 pilot had started taking avoiding action, there would have been little time

for it to take any effect and that the actual flight paths of the subject ac had been purely fortuitous. The recorded radar had shown the subject ac on a line of constant bearing after the C172 was established on base leg, with a turn and descent being executed by the C172 (the reporting pilot's avoiding action) after it crossed the projected track of the C152, during a radar fade period. In the end, the only safety net that had triggered was the very late sighting by the C172 pilot, but this had been too late to be effective. This persuaded the Board that there had been an actual risk of collision.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A non-sighting by the C152 pilot and a very late sighting by the C172 pilot.

Degree of Risk: A

Contributory Factor: Wide cct flown by the C172 pilot.

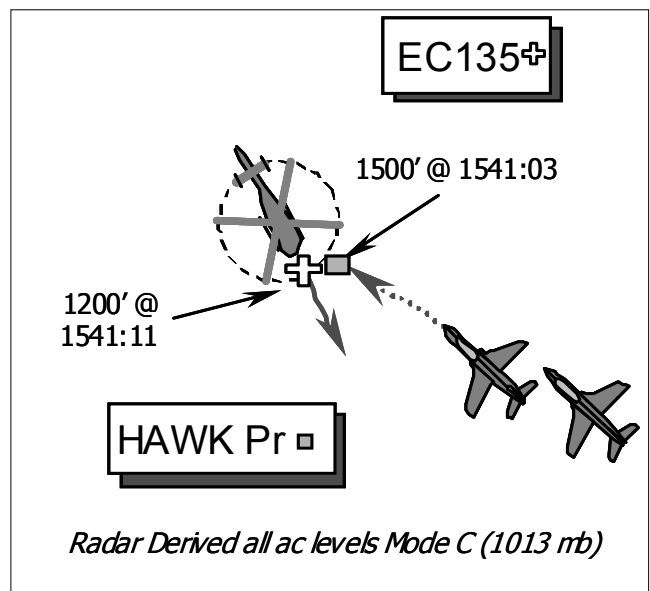
AIRPROX REPORT NO 135/02

Date/Time: 7 Aug 1540

Position: 5516 N 0422 W (Loch Doon - 15 NM E of TURNBERRY)

Airspace: UKDLFS/Scottish (Class: G) FIR

	<u>Reporting Aircraft</u>	<u>Reported Aircraft</u>
<u>Type:</u>	Hawk pair	EC135
<u>Operator:</u>	HQ PTC	Civ Comm
<u>Alt/FL:</u>	400 ft (RPS 1012 mb)	1000 ft (QNH)
<u>Weather</u>	VMC CLBC	VMC CLBC
<u>Visibility:</u>	7-8 km	8 km +
<u>Reported Separation:</u>	300 m H, nil V	1000 m H
<u>Recorded Separation:</u>	Not recorded	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE HAWK PILOT, a QFI, reports he was leading a pair of Hawks on a low-level training sortie in LFA 16 at 420 kt, with the student, the PF, in the front seat. Each ac had its landing lamp switched on and a squawk of A7001 selected with Mode C; neither TCAS nor any other form of CWS is fitted. They were flying about 750 ft below cloud with an in-flight visibility of 7-8 km.

About 16½ NM SSE of Prestwick, heading 320° near Loch Doon at 400 ft RPS, he instructed the

No 2 to join into 'fighting wing' from 'battle' formation, due to worsening weather ahead and in anticipation that some valley flying would be required. During the join, the student pilot in the lead ac's front seat spotted a helicopter on what appeared to be a reciprocal track, at the same altitude and at short range. The PF initiated a hard turn to the R and called the conflict to the No 2, who also broke hard R. After the avoiding action, he also saw the helicopter and assessed that the risk of collision had been averted. It was

AIRPROX REPORT No 135/02.

estimated that the minimum horizontal separation between his ac and the helicopter had been about 300 m and that if avoiding action had not been taken, there would have been a high risk of collision. Following his decision to report an Airprox, the low-level portion of the sortie was terminated and a recovery to RAF Valley was initiated. An initial report was made to Swanwick (Mil) during the recovery.

THE EC135 PILOT, flying an authorised mission at 1000 ft Prestwick QNH, reports his helicopter has a bright red livery and HISLs were on whilst heading 140° at 90 kt at the northern end of Loch Doon. He was under a FIS from Prestwick APPROACH and squawking A7020 with Mode C, but neither TCAS nor any other form of CWS is fitted. The Hawk pair's lights were spotted clearly about 2-3 miles away, and the jets were seen to be flying slightly below his ac's altitude. No avoiding action was initiated because he was already turning away to starboard as the jets passed 'port to port' – about 1000 m away he believed – at a similar height. He assessed the risk of a collision as "very low".

He added that this ac was the standby machine and they were awaiting delivery of a new helicopter, which will be fitted with TCAS. He opined that if fast jet pilots were to use the radio more, or advise ATC of their approximate time that they would be flying in the area, it would help.

THE HAWK PILOT'S UNIT comments that this was a well planned instructional sortie, flown in suitable weather. As there was no NOTAM or CANP warning, to indicate any unusual helicopter activity, and PINS was not active in the area, the crews were surprised to see a helicopter at 250 ft agl. However, the 'see and avoid' principle prevailed throughout and the conflict was resolved, albeit by a small margin, by the positive actions of the student PF. The QFI assessed that there had been a high risk of collision, although his somewhat restricted view from the rear cockpit precluded his own sighting of the helicopter before the PF initiated avoiding action. His decision to terminate the exercise was prudent. This incident is a timely reminder that warnings and procedural height deconfliction will not reduce to zero the possibility of an Airprox. Accordingly, the 'see and avoid' principle and positive actions are, as in this case, vital in order to minimize the risk.

HQ PTC comments that this appears to have been a routine encounter in the UKDLFS during which all crews took appropriate avoiding action. The Hawk QFI's heightened perception of the risk is understandable from his restricted rear seat viewpoint. We do not fully understand the helicopter pilot's final remarks – but suspect that it would not be practicable.

UKAB Note: The Great Dun Fell radar recording does not show this Airprox clearly, however, the Hawk pair are shown at 1541:03, squawking A7001 approaching the Airprox location on the northern shore of Loch Doon indicating 1500 ft Mode C (1013 mb). The EC135 is not shown at this point, neither are the Hawks shown on the next sweep. However, at 1541:11, the EC135 is shown for the first time squawking A7020, indicating 1200 ft Mode C (1013 mb) tracking SE, which is probably moments after the Airprox occurred; the minimum separation cannot be determined with certainty. The Hawk pair are then shown to have turned about onto SE with the no 2 in trail, probably after circling around to the N of the helicopter.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board noted the Hawk pilot's unit comments regarding the crew's surprise that this helicopter was operating within the height band where military fast-jets were commonly encountered throughout the LFS. The 250-500 ft height bracket was not the exclusive preserve of the military jet, far from it, but pilots were advised generally to stay out of that band if it was not essential to the task at hand so as to reduce risk. Here was a useful lesson for military pilots in the LFS. The EC135 pilot was legitimately proceeding about his tasks and whilst compliance with Rule 5 to the ANO might suggest that the majority of civilian ac may be flying above 500 ft agl, the absence of a PINS or CANP warning is no guarantee that civil ac - specifically those helicopters which can be exempt from Rule 5 - will not be encountered. The Board emphasised that military pilots should be in no doubt that such

helicopters could be encountered at any height at any time within the LFS.

The EC135 pilot had spotted the Hawks at 2-3 NM range demonstrating the efficacy of the Hawk's nose light again and the principle of operating with it on. Apparently for this reason, the helicopter pilot was content with the situation; though he stated he was turning away anyway, this was not pre-emptive avoiding action but this turn, nonetheless, contributed to resolving the conflict as the Hawks passed to port – 1000 m away according to his report. The Board commended the student lead Hawk PF for his reaction and adept avoiding action. Although he had apparently seen the helicopter at a later stage than the latter's pilot, the student had played his part in resolving the conflict and had time to call it in to the No2, who broke in turn. Though the QFI had reported that the separation was 300m, it was appreciated that he was unsighted till after the R turn. It was not possible, therefore, to resolve the differing perceptions of the horizontal separation that pertained without more complete radar data – which was not available. However, it was clear that each pilot had seen each other's ac and had turned away, thereby resolving the conflict in the LFS/FIR, which the Board concluded was the cause of the Airprox. In so doing, the Board

concluded unanimously, that each pilot had effectively removed the risk of a collision.

The Board noted the EC135 pilot's comments regarding notification of military LFS sorties to ATSU's, but members thought this suggested a lack of familiarity with fast-jet operations. What made pre-notification to all ATSU's along a route impractical was the speed of jet operations and the significant distances covered during a short 1-1½ hour sortie. Furthermore, most military training sorties will invariably include a practice emergency – possibly requiring diversion action to be practised. Given the potential for ac unserviceability and other delays commonly encountered in day-to-day operations, sorties could be delayed significantly, nullifying the validity of any pre-notification. With regard to the comment about RT communication; it was explained that jet pilots could potentially be switching RT frequencies every few minutes, which again the Board viewed as impractical.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in the LFS/FIR resolved by both the lead Hawk student pilot and the EC135 pilot.

Degree of Risk: C.

AIRPROX REPORT No 136/02.

AIRPROX REPORT NO 136/02

Date/Time: 8 Aug 1348

Position: 5316N 0057W (O/H Gamston
- elev 87 ft)

Airspace: ATZ (Class: G)

Reporting Aircraft Reported Aircraft

Type: C152 ZLIN 50

Operator: Civ Trg Civ Pte

Alt/FL: 1000ft ↑750ft

(QFE 1007mb) (QFE)

Weather VMC CAVOK VMC CLBC

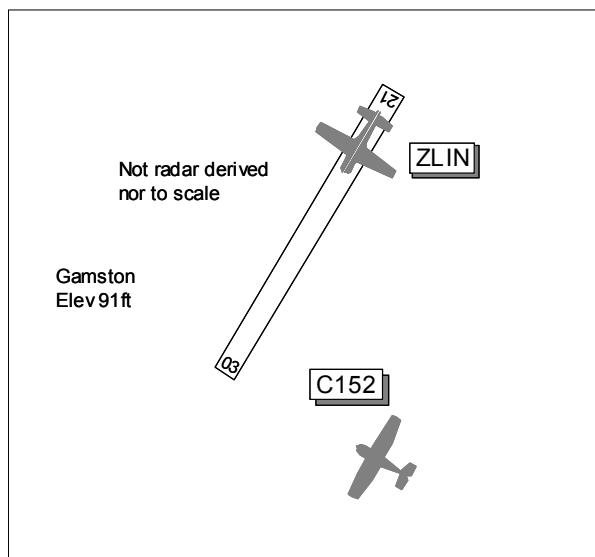
Visibility: >10km >10km

Reported Separation:

25ft V 60ft H 150ft V nil H

Recorded Separation:

not recorded



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE C152 PILOT reports flying a dual instructional training sortie from Gamston and receiving an A/G service from Gamston RADIO on 130.47MHz. The weather was CAVOK, the ac was coloured white and the nav, anti-collision and strobe lights were all switched on. He had joined the visual cct for RW21 RH via an O/H join and was establishing himself into the crosswind position whilst making all the usual RT calls. He had heard RT calls from another pilot and had seen a grey Zlin ac backtracking the RW for departure. Heading 300° at 90kt and 1000ft QFE 1007mb, he was just crossing the upwind end of the RW when he next caught sight of the Zlin to his R as it quickly passed 25ft below and about 60ft behind, too late to take any avoiding action. He assessed the risk of collision as high. Post flight he had talked to the Zlin pilot who had said that he had maintained visual contact with his Cessna, from when he had lined up for departure, during its descent on the deadside until the Airprox. The Zlin pilot had commented "*well I missed you, didn't I!*". The student pilot was quite shaken as a result of the incident and he went on to opine that regardless of the normal 'right of way rules', he considered that the Zlin pilot's actions had been reckless.

THE ZLIN 50 PILOT reports on departure from Gamston on a solo local sortie and in receipt of an

A/G service from Gamston RADIO on 130.47MHz. The weather was CAVOK, the ac was coloured silver and carried no lighting. As he was about to roll on RW21, he heard the A/G operator warn the pilot of a Cessna, which was commencing descent on the deadside for a RH cct, "*be aware of the departing ac with high rate of climb*". This transmission alerted him to the potential conflict and he immediately started looking for the Cessna. At about the time of lift-off, he visually acquired the descending Cessna in his 10 o'clock high. Heading 210° and climbing at a normal speed of 160kph (86kt), which gives a ROC 3000fpm, he realised that this would create an unsafe situation if continued, possibly passing over the Cessna. His normal practice was to climb quickly a) to achieve a safe height as soon as possible, b) to avoid noise over the upwind village and c) for general efficiency. He levelled out at about 500ft and pulled back both on the throttle and propeller whilst the ac continued to accelerate and climb slightly. He then flew underneath the Cessna by about 150ft, which was by now on a 90° crossing track L to R and flying slightly below 1000ft; both ac were more or less over the RW03 threshold numbers and he thought that he was climbing through about 700-750ft QFE at the time of the encounter. Immediately thereafter he pulled up to a steep angle, converting his speed to height, and continued

climbing with reduced power until reaching cruising height although he lowered the nose from time to time to clear his way ahead. Post flight, the C152's instructor had approached him to complain, saying that he had not seen me and his student had been scared by the encounter. Also, he had said that he had been flying slightly low crosswind, by about 50ft.

Later, the A/G operator had said that he had seen the incident and had watched him level off and was satisfied that he had seen the traffic. Also, the 'controller' had done well in giving him a warning of the joining Cessna traffic. He considered that there was no danger at any time and that the instructor had over reacted owing to not seeing him until very late.

THE GAMSTON A/G OPERATOR reports that he had seen the C152 joining overhead and had estimated that the Cessna was slightly below 1000ft as he established crosswind. During the Zlin's departure, he told its pilot of the Cessna's position and the Zlin was seen to lower its nose and level out slightly, the pilot called 'visual' and it was seen to pass below the C152. He believed that if he had not called the conflicting traffic to the Zlin pilot, the Zlin would have passed over the Cessna owing to its high ROC.

UKAB Note: The incident is not seen on recorded radar. The C152 is seen squawking 7000 with no Mode C to approach Gamston from the N and follow a standard O/H joining procedure, positioning RH for RW21. No return is seen at all on the Zlin.

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 A/G operator involved.

Members wondered why the Zlin had flown so close to the Cessna during what should have been a benign situation within a visual cct. The

Cessna pilot had entered the cct from an overhead join and was establishing himself into the crosswind position to pass over the upwind RW threshold. He had visually acquired the Zlin as it was backtracking the RW for departure but had then taken 'his eye off the ball' for he next saw it as it passed close beneath. The Zlin pilot had visually acquired the C152 during his departure phase as the Cessna was positioning from deadside into the crosswind leg. However, although the Zlin had the capability to climb at 3000fpm, members agreed that in these circumstances the Zlin pilot should have adjusted his flight profile to ensure that he would pass well clear of the Cessna that was already established in the cct pattern. As it was, the Zlin pilot had flown unnecessarily close to the Cessna - enough to cause concern to its pilot and this had caused the Airprox.

Moving on to risk, pilot members thought that the C152 instructor should have maintained visual contact with the departing Zlin throughout his joining sequence; not doing so had introduced the 'surprise' element in the Cessna cockpit at the time of the Airprox. Normally, departing ac with lesser performance would be expected to pass well below his ac at the upwind threshold. However, it would have been prudent to monitor the Zlin's climbout after take-off as the departing ac's pilot might not have seen him joining the cct. Members commended the A/G operator's timely warning to the subject ac, which had alerted the Zlin pilot first to the C152's presence and next to its acquisition. Even though the Zlin went on to close on the C152, the Board concluded that he was always in a position to manoeuvre away if need be and so there was no risk of any collision.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: After take-off, the Zlin pilot flew close enough to cause concern to the C152 pilot.

Degree of Risk: C

AIRPROX REPORT No 137/02.

AIRPROX REPORT NO 137/02

Date/Time: 13 Aug 1104

Position: 5211N 0248W (4¼nm SE of Shobdon)

Airspace: UKDLFS/FIR (Class: G)

Reporting Aircraft Reported Aircraft

Type: Hawk T1A Robin DR400

Operator: HQ PTC Civ Pte

Alt/FL: 1500ft 1800ft

(RPS 1014mb) (QFE)

Weather VMC CLBC VMC CLBC

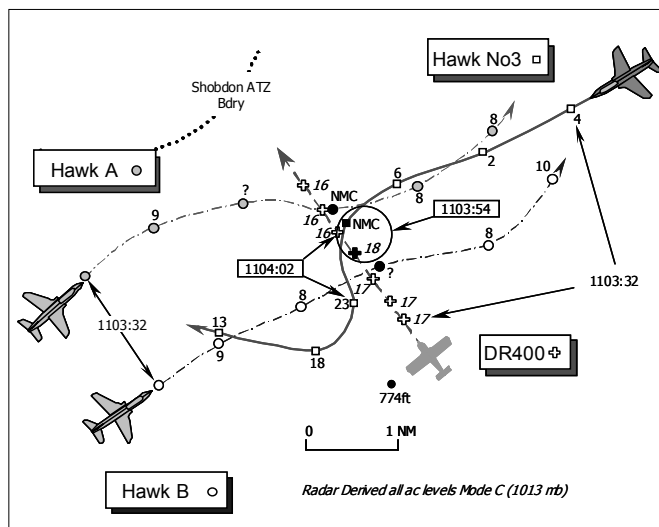
Visibility: 40km 20nm

Reported Separation:

30ft H, 200ft V Not seen

Recorded Separation:

Tracks merged



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE HAWK PILOT, a QFI, reports he was the No3 of a 3-ac Hawk formation on a low-level sortie in LFA4, but flying independently as the bounce ac with a student pilot flying the ac from the front seat. His ac has a black colour scheme and HISLs were on; a squawk of A7001 was selected with Mode C, but neither TCAS nor any other form of CWS is fitted. They were operating VFR on the UKDLFS frequency of 300.8MHz and were not in receipt of an ATS.

About 5nm SE of Shobdon at 350 kt, whilst positioning to bounce the other 2 formation ac he executed a climbing L turn. Once sufficient height was obtained at 2000ft agl they entered a descending L turn to intercept the other 2 ac. Turning through 200° both he and his student – the PF – became aware of a light ac (LA) in close proximity on the nose - less than 1000m away. The PF immediately pitched up, rolled R to wings level and pulled to the 'light buffet' (the maximum ac performance attainable) to avert a collision as the LA passed 30ft away to port about 200ft below his ac. The bounce was subsequently terminated. He assessed the risk of a collision as "high" and added that the high cockpit workload whilst positioning for the bounce had been a factor.

[UKAB Note (1): Despite many requests through HQ PTC for the reporting pilot's F765A, none was

available until 2 days before the Board's deliberations, but the formation disposition and geometry of this encounter was still not confirmed. The diagram above is based solely on data derived from the LATCC (Mil) radar recording and the UKAB staff's interpretation of an occurrence observed at 1104UTC, whereas the No3 Hawk pilot reported the Airprox occurred at 1115.]

THE ROBIN DR400 PILOT provided a very frank report stating he was flying to Shobdon from a private strip near Ross-on-Wye and under a FIS from Shobdon INFORMATION. A squawk of A7000 was selected, but he could not be sure if the Mode C was switched on. Whilst inbound on a heading of 340° at 120kt, flying at 1800ft Shobdon QFE, he observed two military Hawk jets below his ac at low-level, which he kept in sight, however, they never posed any risk to his ac.

After he had landed, the Tower received a call from RAF Valley, and he spoke to the pilot of the No3 Hawk (which he never saw) who informed him that they had flown very close. He said he was performing a 'bounce' manoeuvre on the other Hawks. As he had not seen the third Hawk, he could not make any worthwhile comment and was unaware that the Airprox had occurred until contacted by the Hawk pilot.

UKAB Note (2): From Meteorological Office archive data the BARNSELY RPS for the period 11-1200 UTC was 1012mb.

UKAB Note (3): The LATCC (Mil) Clee Hill radar recording shows the No1 & No2 Hawks westbound passing ahead and below the DR400, one min before the Airprox is presumed to occur. It is not possible to determine which contact is the No1 or the No2, therefore, they are depicted on the diagram as "A & B" and hereinafter referred to as the 'pair'. The target pair turned about eastbound indicating 900ft Mode C (1013mb) and are opposed by an ac that is the No3 'bounce', which is shown on a SW'ly heading indicating 400ft Mode C (1013mb) at 1103:32. The Robin DR400 is shown maintaining a NW'ly track inbound to Shobdon indicating 1700ft Mode C. All four ac converge on a point about 4¼nm SE of Shobdon. After first descending to 200ft Mode C, the No3 initiates a climb and then turns L after passing 600ft. At the next radar sweep at 1103:54, the DR400 indicates 1800ft, but the No3 Hawk shows NMC before reversing into a R turn – possibly the point at which the No3 achieved top of climb and started to descend. The tracks merged between this and the next radar update at 1104:02; minimum horizontal separation was <0.3nm and more probably of the order reported by the Hawk pilot - 30ftH - as the No3 pulled hard to an indicated 2300ft Mode C, some 700ft above the Robin, indicating 1600ft Mode C. Meanwhile, the target pair bracket the subject ac eastbound. Though the respective levels cannot be determined at this point, taking into account the previous and succeeding responses, they were, in all probability, about 800ft below the Robin.

HQ PTC comments that it would be unreasonable to expect a GA pilot – to look out for the bounce. We suspect that his submission might have been less equable if he had seen it, as they were clearly quite close. Nevertheless, despite being tactically pre-occupied, the Hawk pilots were able to see and avoid the Robin.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The HQ PTC member apologised to the Board for the Hawk unit's exceedingly late submission of the supporting Form 765A, whose pilots, unfortunately still did not confirm the formation disposition at the moment of the Airprox. From the Robin pilot's perspective he had already spotted the Hawk pair – A & B – at some point, but it was unclear from his report if he saw the two jets as they crossed ahead of his ac for the first time from E – W before turning about onto their second easterly run [as depicted in the diagram]. Meanwhile - unbeknown to the Robin pilot - the No3 Hawk had orbited to the NE as the crew set up for their next 'attack' on the pair. Members thought it understandable that the Robin pilot's attention should be focused on the fast moving pair closing rapidly from the left and initially distracted away from the other threat coming from the opposite direction and below. The GA member pointed out that the No3 would have been across the cockpit from the Robin pilot - seated on the left - and the low wing configuration of the Robin could have masked the presence of the approaching third jet. However, members were very surprised that the Robin pilot had neither heard nor seen the No3 as it climbed through his level and then descended towards him – apparently very close. Here was an important lesson for GA pilots; "military fast jets seldom fly alone and even if you see two flying towards you there could be another around so keep looking out for them – *don't be distracted by the one to port there may be another to starboard!*" Here, the Robin pilot was oblivious to the presence of the No3 throughout and members determined unanimously this non sighting was one part of the cause.

Turning to the position of the occurrence, one civilian pilot member - highly experienced in flying Hawks - was surprised that this location - so close to the Shobdon ATZ boundary – was the point chosen for the 'bounce' to take place. Nevertheless, other members contended this was Class G airspace where 'see and avoid' predominated and the Hawk formation were perfectly entitled to fly here, observing that the bounce could only take place when the No3 crew could find the pair during their low-level transit. Nonetheless, flying in the vicinity of active GA aerodromes made the potential for an encounter with a civilian ac more likely - as happened here. The skylined Robin should have been plainly visible to the No3 Hawk crew below, who had

AIRPROX REPORT No 137/02.

ample opportunity to spot it before they commenced their pull-up and wing-over into their diving attack on the pair. Moreover, it was surprising that the pair had not spotted the LA and transmitted a warning to the No3, before his next 'bounce'. Whereas this was undoubtedly a period of high workload - both for the No3 student PF and the QFI checking his actions in the rear seat - they should both have been more thorough in checking the airspace they were about to penetrate. Their frank and commendably honest report reveals that they were only "aware" of the Robin at a very late stage in the manoeuvre and it was evident to the Board that this was the other part of the cause – a very late sighting on their part.

This 'awareness' of the Robin and very late sighting instilled in the PF the need for urgent and robust avoiding action; the resultant high energy manoeuvre - rolling R out of the L turn to wings level and converting the plunging descent into a 'max rate' climb - was all that the pilots could do. It was emphasised that by pulling to the light buffet the student PF was working the small wings of the jet to their maximum aerodynamic efficiency to induce the greatest lift – any more and a stall would have resulted – thus he was unable to do any more to manoeuvre his jet away from the Robin than he did. This coupled with the Robin pilot's non-sighting suggested to some members

that an actual risk of a collision had existed. It was difficult to determine the horizontal separation that pertained as the jet passed the LA. The ac tracks certainly merged, but this was between individual sweeps and at these distances members were more inclined to accept the reporting No3 Hawk QFI's opinion that they passed in the order of 30 ft horizontally away from the Robin. Other pilot members whilst realising this was a very close call with devastating potential thought that the Hawk crew had spotted the LA during their manoeuvre in just enough time to enable them to climb their jet 200 ft above the Robin at the critical moment. This was a very robust manoeuvre indeed but it was enough to change the flight path significantly. Whilst not a unanimous decision, the Board concluded that the No3 Hawk crew's avoiding action had been enough to avert an actual collision - just, but that the safety of the ac involved had indeed been compromised during this Airprox.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Very late sighting by the No3 Hawk crew and a non-sighting by the Robin DR400 pilot.

Degree of Risk: B.

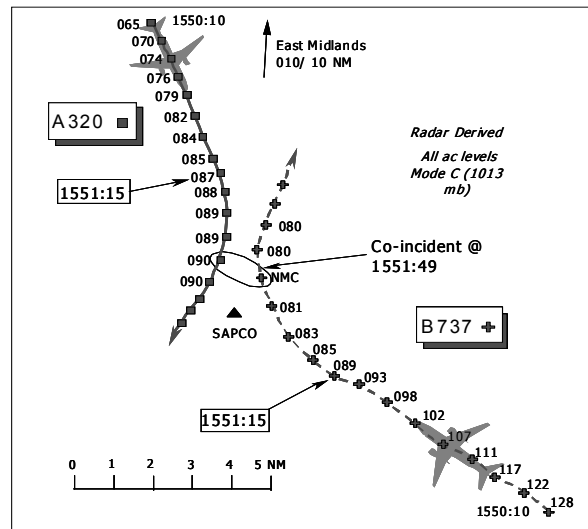
AIRPROX REPORT NO 139/02

Date/Time: 15 Aug 1550
Position: 5232N 0121W (SAPCO)
Airspace: AWY (Class: A)
Reporting Aircraft Reported Aircraft
Type: A320 B737-300
Operator: CAT CAT
Alt/FL: FL 85 ↑ FL 70 est

Weather VMC CLOC VMC
Visibility: 10km 10km

Reported Separation:
 ½-1nm, 800ft 1½-2½nm, 500ft

Recorded Separation:
 4-1nm, 600ft

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

THE A320 PILOT reports that he had departed East Midlands on a Daventry 2N (DTY 2N) SID and had been handed from TWR to APP (134-175). He was climbing to FL70 which was the initial cleared level for the SID, but was instructed by APP to stop climb at FL50. This was subsequently followed by clearance to climb to FL90 and direct routeing to DTY. Approaching FL80 he reduced climb rate to 1000fpm because opposite traffic was seen on TCAS at 10-15nm range, 3700ft above and descending. The crew received a TA when the opposite traffic was at 5nm, followed quickly by an ATC avoiding action turn right onto 210°. The other ac passed through the A320's level at about 2nm, turning right. It then passed about ½nm away, 800ft below. The risk was assessed as "low – potentially high".

The pilot felt that the number of frequency changes when departing from East Midlands had contributed to the Airprox. This made it hard for pilots to build and maintain situational awareness, as well as creating the potential for confusion between controlling agencies, as he thought may have happened in this case.

THE B737-300 PILOT'S report, though requested immediately, was submitted some 4 months after the Airprox. The pilot recalled that he was inbound to East Midlands and was aware of the A320 which was indicating on TCAS, though he

believed that it was descending. He was instructed by Manchester to turn right direct to the 'EME' NDB just prior to hand over to EMA APP and was also aware of an instruction to the A320 to turn right, which had the effect of increasing lateral separation. [UKAB Note: Though he believed the A320 turn instruction had been given by Manchester, and recalled the urgency in the controller's voice, it had in fact been given by EMA APP]. As the crew were turning right and establishing comms with EMA APP, they received a TCAS TA on the A320 which was seen visually "some distance away". The pilot thought that the hand over to EMA APP was late and "inappropriate", and recalled the EMA controller stating that Manchester had "made a mistake". The lateral separation was assessed as 1½-2½nm with about 500ft vertical separation. The risk was described as "nil".

Although East Midlands STARs have recently come into effect, there were no standard routeings at the time of the Airprox. The pilot felt that the controller changes from London to Manchester to East Midlands took place over such a short time that undue pressure was put on controllers and pilots, especially if there were delays in establishing comms due to other traffic.

ATSI reports that at the time of the Airprox, the B737 was under the control of the MACC TRENT

AIRPROX REPORT No 139/02.

Sector, where the workload and traffic loading were described as 'moderate'. The relevant equipment was reported to have been serviceable and there were no other factors which may have adversely affected the controllers' performance. The A320 had departed from East Midlands climbing to FL70 in accordance with the DTY 2N SID, under the control of the East Midlands Approach Radar controller. Following standard procedure, East Midlands informed the TRENT Co-ordinator that the ac was airborne at 1547. At that time, the B737 was still working London Control and was approximately 45nm SE of East Midlands.

Another ac, overflying the area at FL60, was likely to affect the A320, and it was identified to EMA APP by the TRENT Co-ordinator who advised "*subject to that (traffic) you can go up to flight level nine zero and straight to London on (frequency)*". This was contrary to published procedures which state that, for traffic conflicting with East Midlands departures, the MACC TRENT Co-ordinator must ensure that MACC takes control of the departing traffic and effects separation. Shortly after, at 1549:00, the B737 established comms with the TRENT Radar controller and reported descending to FL100 inbound to SAPCO. Fifteen seconds later, EMA APP instructed the A320, which was now clear of the overflight traffic, to climb to FL90.

At 1549:55, the TRENT Co-ordinator telephoned East Midlands to request an inbound level for the B737 which was now 21nm opposite direction to the A320, and the EMA APP controller allocated FL80. Shortly afterwards, the TRENT Radar controller, having seen the level for the B737 on the fps, instructed it to descend to FL80. By then the two ac were 16nm apart, the B737 descending through FL122 and the A320 climbing through FL71.

At about 1551:15 [see diagram], both controllers saw the conflict between the ac. EMA APP, who had previously advised the A320 that Manchester were descending traffic ahead of him, now issued a right turn onto 210°. This was acknowledged, and the controller then transmitted "*...avoiding action traffic left ten o'clock six miles at FL90*". Meanwhile, the TRENT Radar controller, alerted by the activation of STCA saw the B737 passing FL86, below the A320 which was climbing through FL88. He instructed the B737 crew to "*...increase your rate of descent*" but the B737 was by now

leveling at FL80, and its crew responded that they had the traffic in sight.

At 1551:20 the two ac were 5.6nm apart with the B737 200ft below the A320. Thereafter, lateral separation decreased while vertical separation increased. One thousand feet vertical separation was restored as the ac were 1.9nm apart. Minimum separation during the encounter was 4.1nm and 600ft.

The TRENT Co-ordinator later explained that, as Manchester would be unable to climb the A320 above FL90 against the inbound B737 which was descending to FL100, it would be best to transfer the A320 directly to London who were, at the time, controlling the B737. The fps for the A320, which was marked with the outbound level of FL90, was annotated by the TRENT Coordinator to indicate to the TRENT Radar Controller that it was being transferred directly to London. As he would not be controlling the A320, the Radar controller thought there was no traffic to affect it and effectively put it totally out of his mind.

Although the fps for the two ac would have been close together in the TRENT Radar controller's bay, they did not serve to alert the controller to the potential conflict. The process of correlating the A320's SSR code on the strip with the radar display, as required in MACC procedures, was carried out, but this too failed to act as a reminder that the ac were in conflict. When the B737 reported on MACC's frequency, the Radar controller checked its position against the overflying traffic at FL60. With no conflict between the two, he was satisfied that he could descend the B737 to FL80 in accordance with the release as written on the strip by the TRENT Co-ordinator. It was only when STCA triggered that he became aware of the conflict. As the B737 was already below the A320, he did not consider issuing avoiding action other than to instruct the crew to increase descent rate. As the crew reported having the A320 in sight he did not pass traffic information.

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.

Several questions of a technical and procedural nature were asked of the ATSI advisers concerning the individual responsibilities of the Trent sector team. During this process it was established that the Trent Co-ordinator was responsible for detecting fps conflicts, but that the Radar controller was not entitled to disregard the A320 fps and had a “duty of care” to consider it. It was also determined that, had the overflight traffic at FL60 not existed, there would still have been a requirement for MACC to assume control of the A320, so the overflight was not a factor. For the benefit of non-ATC specialists, it was explained that the fps annotation meant only that the Trent Radar controller was not going to work the A320, not that it could be ignored altogether.

The Board established that the Trent Radar controller had been aware of the fps for the A320, but it was uncertain whether this was because the Co-ordinator had actively drawn his attention to it. Although the Co-ordinator had acted contrary to Unit instructions and had by so doing directly influenced subsequent events, actions had been motivated by an attempt to reduce the number of frequency changes. Unfortunately, although adequate information on the A320 was available, the Trent Radar controller had then descended

the B737 without taking the A320 into account, and this produced the conflict.

The actions of the East Midlands Approach controller were commended, though the turn direction given to the A320 was queried. It was felt that the controller would have been aware of the B737’s imminent turn towards the airfield, and that this probably influenced his decision.

In assessing the risk, the Board decided that the actions of the East Midlands Approach controller, together with the TCAS assisted situational awareness and visual sightings of the crews had combined to remove any risk of collision.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause:

- a. The Trent Co-ordinator instructed East Midlands Approach to transfer the A320 to London Control, contrary to Unit instructions.
- b. The Trent Radar Controller descended the B737 without taking the A320 into account.

Degree of Risk: C

AIRPROX REPORT No 140/02.

AIRPROX REPORT NO 140/02

Date/Time: 15 Aug 1049

Position: 5109N 0132W (2.5nm final approach Middle Wallop - elev 297 ft)

Airspace: Middle Wallop (Class: G) MATZ

Reporting Aircraft Reported Aircraft

Type: Lynx AH7 T67M

Operator: HQ DAAvn Civ Pte

Alt/FL: 800ft↓ 1000ft
(QFE 1006 mb) (QNH)

Weather VMC HAZE VMC

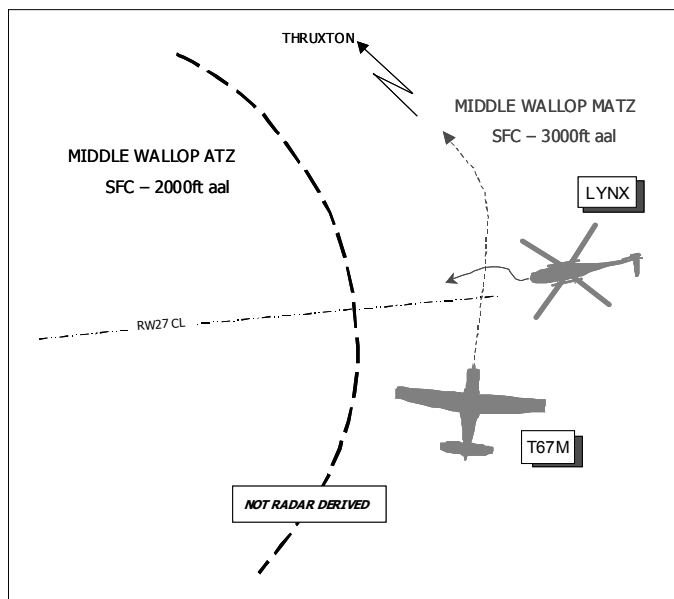
Visibility: NK NK

Reported Separation:

Nil V, 200m H Not Seen

Recorded Separation:

NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE LYNX AH7 PILOT reports that he was PNF on an IF sortie, occupying the LH seat as safety pilot with the handling pilot in the RH seat under an IF hood. During the latter part of a SRA to Middle Wallop RW 27, whilst heading 265° at 100kt and descending through approximately 700ft (Middle Wallop QFE 1006mb), he thought, ATC reported traffic at 10 o'clock. He looked up and saw a low-wing, single-engined ac at co-altitude, come into view from behind the door pillar through the L window at a range of about 400m. The other ac was white, red and blue in colour. He assessed the risk of collision to be high, took control and entered a rapid, descending turn to the R. He estimates that minimum separation was about 200m.

He also reports that his ac was camouflaged grey/green and that nav lights and HISLs were selected on.

THE T67M (FIREFLY) PILOT reports that he was inbound to Thruxton from IOW/Sandown in good VMC at 1000ft (unspecified QNH), hdg 020° at 100 kt and in contact with Thruxton Radio on 130.45MHz. His ac was white with red trim and strobe lights were selected on. He was informed of the incident after landing at Thruxton and rang

Middle Wallop ATC to report that he had not seen the other ac. He was advised that no further action on his part was necessary. Because he was notified of the Airprox some time after the event, he was unable to recall the weather conditions.

THE MIDDLE WALLOP TALKDOWN CONTROLLER reports that he was providing the Lynx pilot with a SRA to RW27 under RIS on frequency 364.825MHz. The Lynx was squawking SSR Mode A code 2671 with no Mode C. He called unknown traffic, hdg 020° and squawking 7000 with no Mode C, to the Lynx pilot 3 times at ranges of 3nm, 2nm and less than 1nm; the last as the Lynx was passing 900ft at 3nm from touchdown. The Lynx pilot reported descending to avoid the traffic, which was then observed to route into the Thruxton ATZ. A call to Thruxton elicited information that the other ac was a T67.

UKAB Note (1): Analysis of the Middle Wallop recorded speech data reveals that at 1049, when the Lynx had just passed 4nm from touchdown, the Middle Wallop Talkdown Controller reported: "There is traffic in your L 10 o'clock crossing you L to R no height information, tracking northbound range of er 1½nm." Traffic information was

updated when the Talkdown Controller transmitted “*Turn R 5°, hdg 265, 3 miles [1049:30 time signal] 900ft, previously mentioned traffic in your L 10 o’clock range of 1 mile northeastbound no height information*”. The Lynx pilot responded “*C/s, in the descent to avoid the traffic*”. Subsequently, Middle Wallop Talkdown Controller advised the Lynx pilot that the incident had occurred outside the Middle Wallop ATZ.

UKAB Note (2): Relevant UK AIP Thruxton entries are as follows:

EGHO AD 2.20 Local Traffic Regulations, Warnings, states: “(a) *Caution due proximity of Danger Areas EG D123, EG D125, EG D126 and EG D127 and of Middle Wallop aerodrome (4nm south of Thruxton) where there is intensive flying training in both fixed and rotary wing aircraft. ...*”

EGHO AD 2.22 Flight Procedures states: “(a) *Inbound aircraft should call Boscombe Down before entering the CMATZ and controllers will ensure the aircraft inbound to Thruxton will be level at an altitude of 1500ft Regional QNH before free calling Thruxton Radio. Circuit joining height is 1300ft Thruxton QFE, ...*”

HQ DAAvn comments that although the Firefly pilot did not actually violate the Wallop ATZ, clear directions are provided in the UK AIP warning of ‘intensive flying training’ at Middle Wallop, together with a requirement that inbound ac should call Boscombe Zone before entering the CMATZ. Clearly the Firefly pilot ignored all such advice, contained in the UK AIP, and was thus largely responsible for creating this conflict. Had he been displaying appropriate airmanship and effective lookout, the onus for taking avoiding action would, in any case, have been his.

The Lynx crew were configured appropriately for the IF training task but, sadly in the most difficult positions to see the Firefly at an early stage. Notwithstanding this, it seems that a collision was avoided solely by the late but rapid avoiding action taken by the Lynx pilot. Further discussions with Wallop ATC confirm that they provided the best possible advice to the Lynx crew, commensurate with a RIS, and apologise for not instructing the Firefly pilot more firmly of the need to file a report.

UKAB Note (3): UK AIP ENR 2-2 Military Aerodrome Traffic Zones promulgates:

Military Aerodrome Traffic Zones (MATZ) are established at the locations listed at paragraph 4 and shown on the chart at ENR 6-2-2-3-1. The purpose of the MATZ is to provide a volume of airspace within which increased protection may be given to aircraft in the critical stages of circuit, approach and climb-out. Normally these zones comprise:

The airspace within 5 nm radius of the mid-point of the longest Runway from the surface to 3000ft aal.

The airspace within a ‘stub’ (or at some aerodromes 2 stubs) projected from the above airspace having a length of 5 nm along its centre-line, aligned with a selected final approach path, and a width of 4 nm (2 nm either side of the centre-line), from 1000 ft aal to 3000 ft aal.

2. Procedures for Penetration of a MATZ by Civil Aircraft

A MATZ penetration service is available from the controlling aerodrome listed at paragraph 4 for the provision of increased protection to VHF RTF equipped civil aircraft. Pilots wishing to penetrate a MATZ are requested to observe the following procedures:

When 15 nm or 5 minutes flying time from the zone boundary, whichever is the greater, establish two-way RTF communication with the controlling aerodrome on the appropriate frequency

4 MATZ Participating Aerodromes

4.1 Middle Wallop. Non-standard reference point, aligned with common radar touchdown, 510822N 0013407W. AD Elevation 297 ft. Stub Heading 256°T (3 nm stub). Controlling Aerodrome Boscombe Down. Frequency to be used 126.700 MHz.”

UKAB Note (4): Analysis of LTCC recorded radar data reveals that the reported incident was not recorded.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac, transcripts of the relevant RT

AIRPROX REPORT No 141/02.

frequency, a report from the air traffic controller involved and a report from the appropriate operating authority.

Military aircrew members voiced concern that this encounter had occurred within a promulgated MATZ, which had been established to afford the Lynx pilot with increased protection in Class G airspace. Some questioned the wisdom of conducting IF training whilst in receipt of RIS, rather than a RAS. Military controllers explained that this could not be mandated generally due to variable and flexible operating constraints, particularly where VFR and IFR traffic has to be accommodated simultaneously.

Much discussion focused upon the responsibility of the T67M pilot in respect of the MATZ. Noting his disregard of the Thruxton warning and promulgated flight procedure, as well as the more general procedure for the Middle Wallop MATZ, a GA pilot member expressed his opinion that the T67M pilot had acted imprudently. Pilot members

were unanimous in the view that it is not only mutually beneficial, but also a matter of good airmanship for pilots of civil ac to comply with the MATZ penetration procedure promulgated in the UK AIP. In this instance, the T67M pilot had not contacted the controlling authority and was, therefore, oblivious of the presence of the Lynx. This had caused the conflict. The Lynx pilot, despite traffic information from ATC, was unable visually to acquire the T67M until late. Following this late sighting members noted the robust avoiding action taken by the Lynx pilot and agreed that the safety of his ac had been compromised.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A non sighting by the T67M pilot in the Middle Wallop MATZ.

Degree of Risk: B

AIRPROX REPORT NO 141/02

Date/Time: 11 Aug 1100

Position: 5037N 0122W (4nm NW St Catherine's Point IOW - elev 100ft)

Airspace: FIR (Class: G)

Reporting Aircraft Reported Aircraft

Type: Paraglider EC120

Operator: Civ Pte Civ Pte

Alt/FL: 30ft agl ↓ NK

Weather VMC CLBC NK

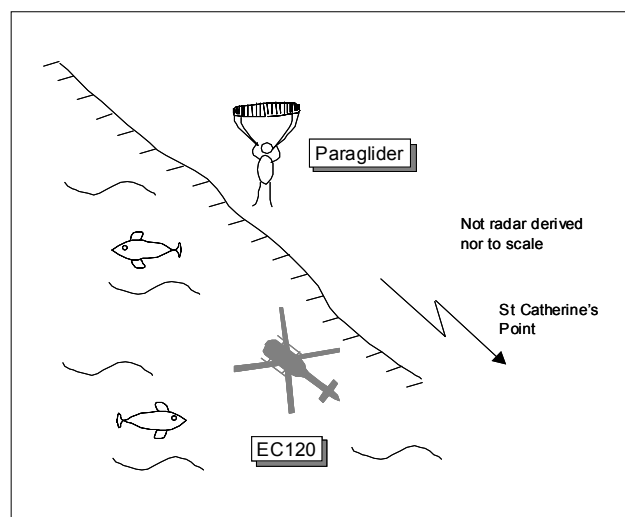
Visibility: 25km NK

Reported Separation:

40ft V 50ft H NK

Recorded Separation:

not recorded



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE AIRWAVE ALTO PARAGLIDER PILOT reports flying en route from Freshwater White Cliffs to Atherfield Holiday Camp, along the SW facing coast of the IOW. The visibility was 25km 1000ft below cloud in VMC and the canopy was

coloured green on the top surface and white underneath. Descending through 30ft agl heading 120° at 15-18kt and about to turn into wind (240°) for touchdown on the cliff edge, he saw a helicopter coloured grey/blue 500m ahead

flying on a reciprocal track just off-shore. He continued with his landing and as he collapsed his canopy when his feet touched the ground, the helicopter passed 50ft in front of and 40ft below him. He estimated the helicopter was flying at 30ft amsl, below the cliff top level. The wind speed was approx 18kt which is very close to the top speed of his paraglider so his manoeuvrability was severely limited during the landing phase.

THE LOCAL PARAGLIDER CLUB CFI reports being at the incident location, 25m inland from the cliff edge; field elevation <30m. The Airwave reporting pilot, with 90hr experience, was landing at the time and subsequently contacted him for advice as he wished to take reporting action. Ten other paraglider pilots were gathered on site, standing on the edge, and they had pointed down towards the helicopter whilst trying to attract his attention. It was seen by these observers to pass at high speed heading 300° at about 90kt and 50ft amsl with its rotor below the cliff level very close to the beach; it was not visible from his standpoint. The turbine engined helicopter was coloured blue with grey topsides, possibly with white on the runners or underside, its tail rotor was enclosed and it had a large glazed front windscreen. There appeared to be 4 or more passengers onboard with a blonde lady wearing a blue jumper seated in the rear starboard seat. The surface wind was 240° at 18kt in unstable pre frontal conditions, scattered cloud base 600ft. This particular site is frequently used with soaring activity taking place within a lift band from msl up to 1500ft amsl and from cliff edge to about 500ft to seaward into wind. Operations are physically restricted to this tiny sliver of airspace which can be hazardous if wake turbulence is encountered and because of the paraglider's limited manoeuvrability.

THE EC120 PILOT was contacted post incident and subsequently declined to complete a CA1094 Airprox Report Form. He was rather taken aback when he was apprised of the incident, saying that he had seen the paraglider but he had passed nowhere near the 50ft distance stated by its pilot.

THE BHPA comments that it is both disappointing and surprising that the helicopter pilot declined to complete the CA1094, as it is therefore not possible to assess his version of events and produce a more complete picture of what took place. For example, was the paraglider that he saw the one that filed the Airprox? Probably more

than in any other combination of ac, the mere proximity of a helicopter represents a serious risk to a paraglider owing to the wing's susceptibility to turbulence and the amount and types of turbulence generated by helicopters. Even though the helicopter flew below the paraglider, the fact that it was doing so upwind of a soarable slope means that (depending upon; relative positions, air mass stability, topography, wind speed & direction and flight profiles) there was a risk of the turbulence being blown up the slope and into the paraglider's flight path. Additionally, the prevalent wind speed and the paraglider pilot being on approach to land on the hilltop reduced his possible safe options to manoeuvre away from the risk to virtually zero.

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

UKAB Note (2): A Met Office aftercast for 1100Z in the St Catherine's Point area gave a surface wind 25015KT, 2000ft wind 26015KT, visibility 25km with isolated spots of light rain or drizzle and a cloudbase BKN/OVC 900 ft multi-layered above. Lower cloud, rain/drizzle with basically poorer conditions spreading in from the W/SW reaching the IOW area about 1hr post Airprox.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from Paraglider pilot and from the appropriate operating authorities.

Members were disappointed that the EC120 pilot had declined to complete a CA1094 report for the incident. From the limited information available, it was clear that the helicopter had flown below the cliff height, close to the beach and that the airmanship displayed by its pilot by low flying was questionable. There may have been a good reason for the helicopter's selected flight path, but without the pilot's side of the story this would never be shared. Also, some doubt was expressed whether the helicopter pilot had seen the subject Paraglider but this could not be clarified. Although hang/paraglider sites are no longer shown on topographical charts unless winch activity is involved, these types of operation could be encountered anywhere in the UK FIR below 2000ft. Leaving possible breach of Rule 5

AIRPROX REPORT No 142/02.

(Low Flying) aside, there had been no doubt that the EC120 had flown below and adjacent to the Paraglider pilot, but its presence had been detected in good time, with the helicopter only passing after the Paraglider pilot had landed. Even so, the EC120 pilot had flown sufficiently close to cause concern to the Paraglider pilot and this had caused the Airprox.

Although the Paraglider pilot's options were limited, he had seen the helicopter 500m away and had continued with the best option at the time

by landing. The Board agreed that this action by the Paraglider pilot had been effective in removing any risk of collision.

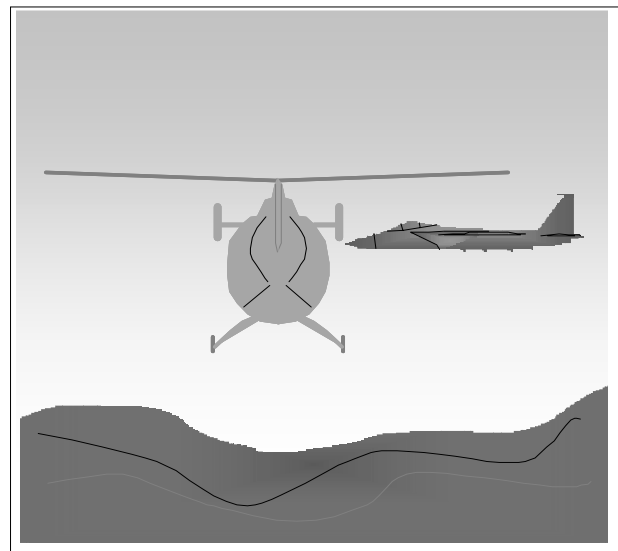
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The EC120 pilot flew close enough to cause concern to the Paraglider pilot.

Degree of Risk: C

AIRPROX REPORT NO 142/02

Date/Time: 20 Aug 1633z
Position: 5154 N 0356 W (15nm N of Swansea)
Airspace: LONDON FIR (Class: G)
Reporting Aircraft Reported Aircraft
Type: Bo 105 F-15
Operator: Civ Comm Foreign Mil
Alt/FL: 1000 ft 1000 ft
(QNH 1018 mb) (msd)
Weather VMC CLOC VMC CLOC
Visibility: 50 km NR
Reported Separation:
300m H, 0ft V 600m H, 500ft V
Recorded Separation:
Not Recorded



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BO 105 PILOT reports that he was engaged on an air ambulance mission and was approaching the scene of a road accident from the south. His helicopter was coloured yellow and was displaying HISLs, navigation and landing lights. Transponder and Mode C were on but TCAS was not fitted. Whilst flying level at 1000ft and 115kt, a grey coloured F-15 was seen to pass from right to left, 300m ahead of the helicopter at the same height. The F-15 was not sighted until it was immediately ahead and no avoiding action was possible in the time available. The pilot assessed the risk as “high” and added that at the

time of the Airprox both he and his “paramedic navigator” were concentrating in the area immediately ahead to locate the scene of the accident. He was also aware that a Police helicopter was operating in the area but was not visual with it at the time.

THE F-15 PILOT reports that he was engaged on a low flying training exercise and at the time of the exercise was not in receipt of an ATS. His ac was coloured dark grey and HISLs were selected on. He was squawking 7001 with Mode C, but TCAS was not fitted. He obtained radar contact on a

slow moving helicopter in the Airprox area at range 15nm, and at 5nm sighted the contact, described as a dark green single bladed helicopter. He judged the helicopter to be about 500ft above and at least 2000ft horizontally from his flight path at the closest point. He called for his wingman to “check away” to remove any confliction.

UKAB Note (1): The F15 pilot’s description of the helicopter differs markedly from the description given by the Bo 105 pilot of his ac. It is likely therefore that the F15 pilot saw either the Police helicopter which was operating in the area or another, unknown ac.

UKAB Note (2): Analysis of the Cleve Hill radar recording shows a contact, believed to be the F15, heading WNW towards the reported Airprox area with speed and Mode C consistent with the F15’s sortie profile. This contact is lost from radar about 5nm before the reported Airprox position. Apart from a brief primary contact to the south of the reported position, there are no other returns in the area and the Airprox itself is not recorded.

PART B: SUMMARY OF THE BOARD’S DISCUSSIONS

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

The Board sought clarification of the term “check away”, used by the F15 pilot. It was explained that this meant “to turn and manoeuvre the ac to avoid the traffic. Normally lateral and vertical manoeuvres would be made to ensure deconfliction”.

Opinions were divided on which helicopter the F15 pilot had seen, either the reporting one or possibly the Police ac which was thought to be in the area. There were strong reasons to support the latter, notably the different descriptions of the helicopter. However, several Board members observed that this remained speculation and put forward arguments to suggest that there had not been any mis-identification. It was felt that the

colour could have been wrongly assessed, given the 5nm range at which the helicopter was seen. Additionally, the capabilities of the F15 radar were such that, had there been two helicopters in the area, the F15 pilot would most likely have been aware of each of them. It had not been proven that another helicopter had in fact been in the area and, given the time that had passed since the Airprox occurred, it was impractical to do so.

The different separation estimates were noted, and although these may have added to the argument that the F15 did not see the reporting helicopter, it was also possible that the Bo105 pilot had underestimated the range. This could possibly be due to the size of the F15 which is considerably larger than those fast jet types more frequently encountered in the UKLFS. This may have been compounded by the element of surprise, which could also lead to an underestimate of separation.

The effectiveness of the helicopter crew’s lookout was observed to have been reduced as both occupants were searching the ground immediately ahead of the helicopter. However, helicopter Board members felt that this was acceptable, given the phase of flight and the task they were engaged on.

Despite much discussion, the Board felt in the end that, the “picture” could not be resolved fully. Whilst it was clear that the helicopter crew had sighted an F15 late, it was not so clear whether or not the F15 pilot had seen the helicopter, or even which of the F15s the helicopter had reported on. One member thought there was insufficient information available to assess, but others felt that the available information, whilst not conclusive, suggested that the F15 pilot did not see the reporting helicopter. Similarly, the assessment of risk was made difficult, as it too depended on whether the F15 had seen the reporting helicopter. On balance, it was agreed that the separation would not have been less than the Bo105 pilot’s estimate of 300m and so, whilst there had not been an actual risk of collision, ac safety had not been assured.

PART C: ASSESSMENT OF CAUSE AND RISK

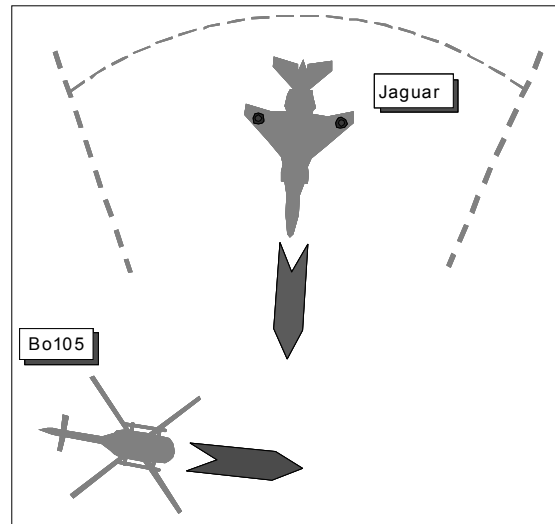
Cause: Very late sighting by the Bo105 pilot and a probable non-sighting by the F15 pilot.

AIRPROX REPORT No 143/02.

Degree of Risk: B

AIRPROX REPORT NO 143/02

Date/Time: 19 Aug 1444
Position: 5149 N 0435 W (Whitland)
Airspace: FIR / UKLFS (Class: G)
Reporting Aircraft **Reported Aircraft**
Type: Bo105 Jaguar
Operator: Civ Comm HQ STC
Alt/FL: 800ft 600ft
(RPS 1010 mb) (Rad Alt)
Weather VMC CLBC VMC CLBC
Visibility: 50 km 15 km
Reported Separation:
0 H, 50ft V ¼nm H, 0 V
Recorded Separation:
Not Recorded



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE Bo105 PILOT reports that he was engaged on an air ambulance flight between Haverfordwest and Oxford. His helicopter was yellow and was displaying HISLs, navigation and landing lights. Transponder with Mode C was fitted but TCAS was not. Whilst in level cruise at 800ft and some 500ft below cloud, a grey coloured Jaguar was seen to pass directly below with about 50ft vertical separation. The Jaguar was believed to have approached from the 8 o'clock, a direction not easily cleared by the Captain sitting in the RHS. The Jaguar was sighted too late for avoiding action to be taken.

THE JAGUAR PILOT reports that he was flying as number 4 of a 4 ac formation which was engaged on a low level training exercise. His Jaguar was coloured grey and HISLs were on. TCAS was not fitted but the ac was squawking 7001 with Mode C. He was not in receipt of an ATS but was working on a Squadron frequency. At the time of the Airprox he was manoeuvring whilst approaching a target run at 450kt. In the course of his manoeuvring, he pulled up slightly and saw a yellow helicopter to his right at about 1nm range. He assessed that his climbing flight

path would take him in front of the helicopter and believed that he passed about ¼ to ½nm from it at a similar height, which he reports as 600ft radalt. He wagged his wings to indicate that he had seen the helicopter and assessed the risk of collision as "nil".

UKAB Note (1): Each pilot's diagram of the geometry of the encounter differs slightly with respect to the closing angle. The Bo105 pilot, who was heading 095° reports the Jaguar approached from his 8 o'clock, though he did not actually see the Jaguar as it approached. The Jaguar was heading about 200° and saw the helicopter in his 1-2 o'clock which would, if accurate, put his approach more in the helicopter's 10 o'clock position.

HQ STC comments that the two pilots' reports are difficult to reconcile. The Helicopter pilot reports passing 50ft directly above the Jaguar, which approached unseen, while the Jaguar pilot reports passing in front of the Helo. However, the Jaguar pilot saw the Helo in sufficient time to avoid it safely and also to 'waggle wings' to indicate the safe avoidance.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted only of the reports from the pilots of both ac.

The Board sought clarification on the exact lateral separation reported by the Jaguar pilot. It was explained that, while his narrative of the event described it as 0.25nm, his initial confirmatory report was 0.25 to 0.5nm. Subsequent discussion and analysis was based on the lower figure.

There was an obvious and large discrepancy between the separation reports, too large some members felt to be accounted for by normal variations in individual assessments. This left two possibilities, they thought. Firstly, that one or both pilots may have exaggerated the ranges or secondly, that one or both of the pilots involved may have reported on a different ac. On the first possibility, the majority of members had no reason to doubt the veracity of either pilot's report, and this possibility was not pursued. Addressing the second point, although there were three other Jaguars in the formation, it was thought that the subject pilot would have been aware of their positions on their separate time co-ordinated attack runs. It was considered unlikely that any would have been in such close proximity to the helicopter to cause confusion. Despite this, there remained a possibility that the helicopter had encountered another Jaguar and, if this had been the case, it would most likely have been another in the same formation. Questions were asked about whether the Jaguar pilot had reported in detail on the whereabouts of the other ac. It was confirmed that he had not, but an undertaking was made to contact the pilot again to try to establish this.

Accepting the possibility that a second Jaguar may have been involved, discussion moved on, focusing on the information available. This suggested to the Board that, whilst not certain, the likelihood was that only two ac were involved, and they were the ones being considered. Further discussion was based on this assumption. The Board concluded that the Jaguar pilot had seen the helicopter in time to affect the outcome, but queried whether his actions had been sufficient to remove completely the risk of a collision. Pilot

members took the view that 0.25nm if accurate might not have been seen as unnecessarily close by the Jaguar pilot, but acknowledged that this opinion would not have been shared by the helicopter pilot. It was noted that the Bo105 pilot did not report seeing the reported wing waggle.

In determining the cause, the majority of Board members thought that it was unlikely that another Jaguar had been involved, and accepted that the Jaguar pilot had seen the helicopter in time to be able to affect the separation. He did not take avoiding action, but had assessed that his flight path would take him sufficiently clear of the helicopter to assure safety. However, the general view was that he could have achieved greater separation and it would have been prudent to do so. Assessment of risk proved difficult, given the differing accounts. One argument was that no collision risk existed as the Jaguar had seen the helicopter and avoided it. There was little doubt that concern had been caused to the helicopter pilot, but it did not automatically follow that safety must have been compromised. Conversely, the helicopter pilot's report pointed to a high risk of collision. Although some thought there was insufficient information to determine what risk had been involved, this was a minority view. In the end, the Board decided that an actual risk of collision had not existed, but that safety had been compromised.

UKAB Note (2): The Jaguar pilot was contacted and asked for further information about the other formation ac. The lead pair were some two minutes ahead as they approached their target run and, although he was aware of their position, he was not visual with them. He was flying in the second pair, on a similar track to the leaders, although the No3 ac had separated from him and pulled up to a higher altitude as part of the attack profile. The pilot recalled the formation members discussing the encounter with the helicopter after landing, and stated that no other formation pilots saw it. Although there was a possibility that one of the leading Jaguar pair may have come close to the helicopter without seeing it, such a situation meant that subsequently the helicopter pilot had not seen his ac (the subject Jaguar) since only one Jaguar was reported on. He thought all of this was unlikely and that his ac had been the one reported by the helicopter pilot.

AIRPROX REPORT No 144/02.

PART C: ASSESSMENT OF CAUSE AND RISK

Degree of Risk: B

Cause: The Jaguar pilot flew sufficiently close to the Bo105 to cause concern to the Bo105 pilot, who remained unsighted until late.

AIRPROX REPORT NO 144/02

Date/Time: 21 Aug 1030

Position: 5154N 00221W (6.75nm W of Gloucestershire Apt - elev 95 ft)

Airspace: London FIR (Class: G)

Reporting Aircraft Reported Aircraft

Type: B206 Harrier GR7

Operator: Civ Trg HQ STC

Alt/FL: 2200ft ↓250ft

(QNH 1021 mb) (RPS)

Weather VMC CAVOK VMC CAVOK

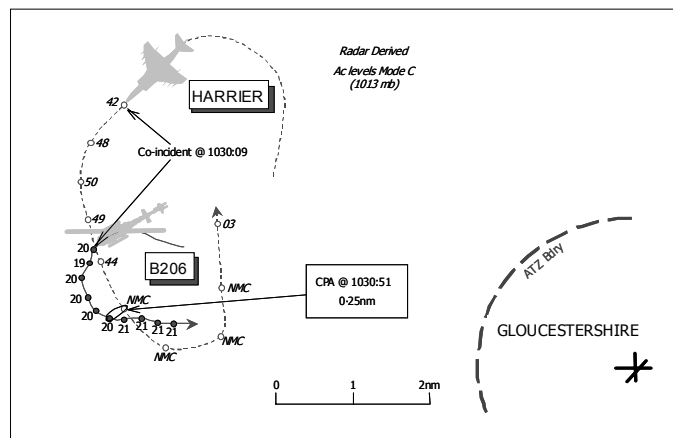
Visibility: 40km 25km

Reported Separation:

NK V, <0.25nm H Not Seen

Recorded Separation:

NR V, 0.25nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE B206 (JETRANGER) PILOT reports that he was on a training sortie from Norwich to Gloucestershire Airport, at 7nm final approach to Gloucestershire RW 09 during a procedural NDB/DME approach and in contact with Gloster Tower, he thought, on 122.9MHz. His ac was coloured red, white and blue and anticollision and nav lights were selected on. He was flying out of sun in good VMC with 40km flight visibility. Whilst hdg 095°, level at 2200ft (Gloster QNH 1021mb), flying at 100kt and just about to commence final descent, jet engine noise was heard above that of the engine of his ac and a Harrier, in a rapid descent, suddenly appeared just ahead having descended from above and behind. The helicopter shook violently as it passed through the Harrier's wake. There was no time to take avoiding action and the B206 pilot assessed that there had been a high risk of collision. The

Harrier, still descending, then turned L on to a reciprocal hdg and passed about 1000m down his LH side and about 1000ft below.

THE HARRIER GR7 PILOT reports that he was operating VFR in good VMC and in descent from 5000ft (RPS) to 250ft (Rad Alt), with SSR selected to 3/A Code 7001, he thought, with Mode C. His ac was camouflaged in combat grey, HISLs were selected on but the ac was not equipped with TCAS or any other form of CWS. At the time of the reported incident, which was prior to a 4 ship bounce at Ledbury, he would have been hdg 340° in a straight descent at 420kt. He did not see a helicopter in the area that, apparently, was below him initially as most of his concentration was aimed at the area of Ledbury. This would lead him to believe that the B206 was obscured from his field of view due to the dynamics of his ac.

THE GLOSTER APPROACH (APP) CONTROLLER reports that he was providing a procedural service, on 125.65MHz, to an inbound B206 conducting an NDB/DME approach to RW 09. Having just completed base leg, the pilot reported coming close to a Harrier. In response he advised the B206 pilot that the Harrier was not under service from Gloster. Information on the presence of the Harrier was, however, passed to another ac inbound from the NW. The B206 was then transferred to Gloster Tower at approximately 5nm final approach and after landing, at 1038, the B206 pilot informed the Tower controller that an Airprox would be filed.

Gloster APP also reports that the Gloucestershire 0950 METAR was: VRBL 04, 50km, FEW 2500, QNH 1021, QFE 1018, +19.

UKAB Note (1): Analysis of the Gloster APP RTF transcript reveals that just before 1031 the B206 pilot reported to Gloster APR "(c/s) base turn complete. We've just been overflown by a Jaguar, a Harrier even." Because Gloster APP missed this transmission, the B206 pilot then transmitted "*er, we're base turn complete and we were just, er, had a close miss with a Harrier. Just gone through his wake.*" When asked by Gloster APP whether he would be filing an Airprox, the B206 pilot initially responded that he would not, adding "*... we actually saw him, er, in time to avoid*". However, when further questioned by Gloster APP as to the altitude of the Harrier, the B206 pilot responded "*... he was descending rapidly from, er, behind us and above us and went, er, probably about 500yds ahead of us.*"

HQ STC comments that 'see and avoid' principles appear to have failed to alert the 2 pilots to each other's presence. FJ pilots performing dynamic, 3 dimensional activities - ie bounce and aggressor ac - need to manoeuvre their ac positively to facilitate lookout and clear their flight paths above and below. Furthermore, when operating near airfields, a courtesy information R/T call can help build everyone's situational awareness.

UKAB Note (2): Met Office archive data reveals that the Cotswold RPS for 1000 – 1100 was 1016mb.

UKAB Note (3): Analysis of the Clee Hill radar data recording reveals the B206, squawking SSR Mode A code 7000 with Mode C to the WNW of

Gloucestershire Airport. Just before 1030 the B206 commences a L turn inbound. Meanwhile 2.5nm to the NE a Mode A 7000 squawk with Mode C is making a climbing turn to the left, this is believed to be the Harrier GR7. At 1030:09 the B206, displaying 020 on Mode C, is about a third of the way through the inbound turn whilst the Harrier, displaying 042 on Mode C, is 2nm N tracking SW. Two sweeps later, at 1030:26, the Harrier displays 050 on Mode C and is seen to turn onto a SSE track rapidly overtaking the B206, which is still in the L turn at 1 o'clock, range 1.5nm, with Mode C displaying 020. The Harrier then commences descent and at 1030:51 the B206, which by now has completed its inbound turn onto E, is 3 o'clock to the Harrier range 0.25nm. Unfortunately, neither on this nor the next 3 radar sweeps sweep is Mode C evident from the Harrier. The Harrier crosses ahead of the B206 by approximately 0.3nm, before commencing a L turn onto N and recrossing the track of the B206 about one mile ahead. At 1031:24 the Harrier's Mode C shows 003, at which point the Harrier, still hdg N, is 1.5nm NNE of the B206. Thereafter, the Harrier disappears below radar cover whilst the B206 continues inbound to Gloucestershire Apt.

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, a report from the air traffic controller involved and a report from the relevant operating authority.

Members were agreed that this encounter, which occurred within Class G airspace in good VMC, was the result of non sighting by both pilots. Therefore discussion centred upon responsibility and ability of the respective pilots to maintain adequate lookout. It would have been difficult for the B206 pilot in his LH turn to see the Harrier as it approached from above in the B206's rear quarter. Based upon radar plots, it was estimated that the B206 pilot would have had no more than 6–7 sec in which to acquire the Harrier, during which time he would have been preoccupied with accurate completion of the procedural turn. The Harrier pilot, however, was in a much better position to see the B206 although he admits that he did not. This may have been due to the B206 being obscured from view under the ac's nose

AIRPROX REPORT No 146/02.

when he commenced descent about 15 sec before CPA. A military pilot member suggested that the Harrier pilot should have manoeuvred his ac dynamically before diving down to ensure his intended flight path was clear; apparently he did not do so. Accordingly, the Board agreed that the encounter was caused by the Harrier pilot.

As to risk, members were influenced by the B206 pilot's reactions at the time, as recorded on the RTF transcript. They noted that the B206 flew through the jet wake of the Harrier and that the pilot's estimate of minimum separation, ≤ 0.25 nm, was corroborated by radar data. They also noted that although the B206 pilot transmitted that he had time to avoid, about 10 – 15 sec, this was almost certainly after CPA when risk was diminishing rapidly. It was evident that the distance between the ac had been a matter of luck

rather than lookout and, given the non sighting of the B206 by the Harrier pilot coupled with the Harrier's rapid ROD, it was clear that a degree of risk had existed although members were divided as to its extent. Some thought that a risk of collision had existed, as the B206 pilot had not seen the Harrier until after CPA. However, the majority, in noting the B206 pilot's RT exchange with Gloster APP, took the counter view that there had been no risk of actual collision, but the safety of the B206 had not been assured.

PART C: ASSESSMENT OF CAUSE AND RISK

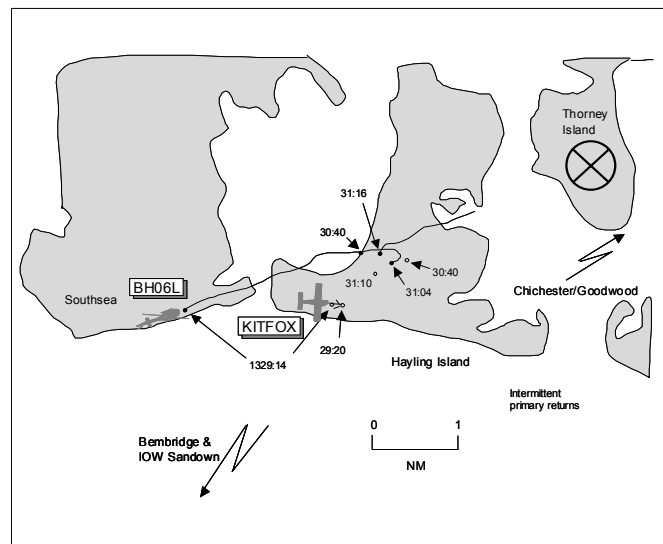
Cause: A non sighting by the Harrier pilot.

Degree of Risk: B

AIRPROX REPORT NO 146/02

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Date/Time: 16 Aug 1331
Position: 5048N 0059W (O/H Hayling Island)
Airspace: FIR (Class: G)
Reporting Aircraft Reported Aircraft
Type: Kitfox BH06L
Operator: Civ Pte Civ Trg
Alt/FL: 1500ft 1500ft
(QNH) (QNH)
Weather VMC CAVOK VMC CAVOK
Visibility: 10km >10km
Reported Separation:
50ft V 100ft H not seen
Recorded Separation:
<0.25nm H



THE KITFOX PILOT provided a comprehensive report. He was flying a local solo sortie from Popham, turning overhead Hayling Island, at 1500ft and 65kt and he was listening out with Popham RADIO on 129.8MHz; the transponder was switched off. The visibility was >10km in CAVOK conditions, the ac was coloured blue/yellow and his wing tip strobe lights were switched

on. Whilst turning N to return to Popham he spotted a helicopter, a BH06 JetRanger possibly coloured black, over the Southsea ferry area about 1nm to his L; it was heading E, below him and climbing on a potentially conflicting course. As he was on a recreational flight and although he had right of way, he decided to keep out of the helicopter's path. He did so by turning L onto W to

track in the opposite direction, planning to pass about 200yd to the S of it and slightly above, with the intention of turning R back onto N after it had passed. As the helicopter closed to within 0.5nm, he waggled his wings about 5 times to make his ac more conspicuous but no response was received so he now believed that the helicopter pilot had not seen his ac. The anticipated 200yd separation distance had diminished, possibly because the helicopter pilot had altered course slightly; by now, he was 400-600yd N of the coast just S of the JetRanger. He immediately executed a L turn onto S to increase the separation distance. After levelling his wings from the turn, he looked over his L shoulder to ascertain that the helicopter had cleared behind his ac. However he was shocked to see the BH06 in his 7 o'clock position, 200ft behind and slightly below, heading towards him but in a very tight R banked turn. His natural reaction was to apply full power to increase his speed (such as it was) and to climb to avoid - he couldn't think what the helicopter pilot was doing, flying so close and aggressively, passing 50ft below and 100ft behind. A few seconds later, he was over the coast at 1600ft and although he looked urgently to find the helicopter, it had disappeared from view. He believed the helicopter pilot had deliberately attempted to fly close to his ac despite his efforts to maintain separation.

THE BH06L LONGRANGER PILOT reports carrying out a type rating conversion flight whilst en route from Sandown IOW to Chichester Goodwood squawking 7000 with NMC. The visibility was >10km in VMC, the ac was coloured silver with a blue top fuselage carrying dayglo orange markers on the 2 tail-boom vertical stabilizers and the tail rotor fin. After communicating with Bembridge RADIO on 123.25MHZ, he had been in receipt of a FIS from Goodwood on 122.45MHz and had transited the Hayling Island area on a NE heading at 1500ft and 120kt. He had not seen the reporting ac at all.

UKAB Note: Analysis of the Pease Pottage recorded radar at 1329:14 shows the BH06L tracking 070° along the coast just to the E of Southsea squawking 7000 with an intermittent primary only return, believed to be the Kitfox, in its 1 o'clock range 1.8nm tracking E. The Kitfox fades 12 sec later whilst the LongRanger continues on a generally ENE track. A pop-up return, possibly the Kitfox, is seen over the middle

of Hayling Island at 1330:40 with the BH06L 0.53nm to its W now tracking E. The LongRanger enters a RH orbit about 12 sec later, fading for 1 sweep at 1331:04. The next sweep at 1331:10 shows a single pop-up return on the Kitfox within 0.25nm SW of the BH06L's last seen position. The LongRanger reappears a further 6 sec later turning through N and shortly thereafter is seen to regain its ENE track with the Kitfox showing again temporarily at 1331:28 0.66nm SSW of the helicopter. CPA is believed to occur during the BH06L's radar fade period.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members were amazed that the two pilots in the LongRanger had not seen the Kitfox during their transit over Hayling Island. Prior to commencing their orbit, the onus had been on the BH06L pilots to carry out a lookout scan to clear the area into which they would be manoeuvring; this appears to have been deficient. The Kitfox, although a small ac, should have been seen. It would have been 'skylined' prior to levelling-off and subsequently it was just to the R of their track, almost head-on, for some time (the Kitfox pilot had waggled his wings several times to make himself more conspicuous). All this took place immediately before the helicopter commenced a R turn. Pilot members questioned the wisdom of the Kitfox pilot's plan. He had executed a turn towards the LongRanger, aiming to pass just to the S of it by a small margin; later this distance had become eroded, necessitating more aggressive manoeuvring to pass clear. Although not ideal, it had allowed the Kitfox pilot to maintain visual contact with the approaching BH06L until a L turn away had become necessary. It was noted with critical disappointment that the Kitfox was not squawking owing to the transponder being switched off. Best practice was to squawk 7000 with Mode C for conspicuity to SSR equipped ATSUs and to TCAS equipped ac. Also, there appeared to be no benefit in working Popham RADIO whilst operating on the S Coast whereas a FIS from Goodwood may have alerted him to the helicopter's presence on their frequency. Members agreed that the BH06L pilot flew into conflict with the Kitfox which, for whatever

AIRPROX REPORT No 148/02.

reason, he did not see and this had caused the Airprox.

The LongRanger pilot's attention may have been directed towards a ground feature during the turn possibly to the detriment of lookout, or a practice steep turn exercise (recorded radar shows a tight RH orbit completed in just 30 sec). The helicopter's R turn into confliction had coincided with the Kitfox pilot's L turn away and this action had been enough to remove an actual collision. However, with one crew unsighted throughout this

led the Board to conclude that safety of both ac had not been assured.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The BH06L pilot flew into confliction with the Kitfox which he did not see.

Degree of Risk: B

AIRPROX REPORT NO 148/02

Date/Time: 22 Aug 1104

Position: 5157 N 0045 W (8nm SW Cranfield
- elev 358 ft)

Airspace: FIR (Class: G)

Reporting Aircraft Reported Aircraft

Type: PA 28 TB20 Trinidad

Operator: Civ Pte Civ Pte

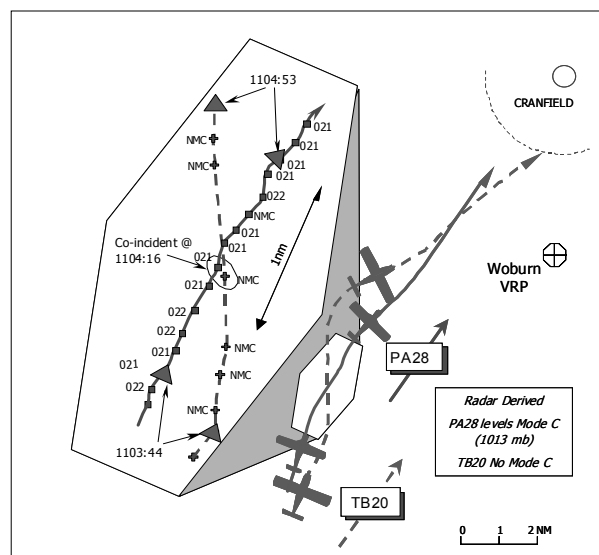
Alt/FL: 2600ft
(QNH 1019 mb) (QNH NR mb)

Weather VMC CLOC VMC CLOC

Visibility: 25km >10km

Reported Separation:
0 H, 30ft V Not Reported

Recorded Separation:
Plots merged



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE PA 28 PILOT reports that he was in transit VFR between White Waltham and Old Buckenham and at the time of the Airprox was flying at 90kt towards the CFD VOR at 2600ft on the Cranfield QNH. He was receiving a FIS from Cranfield APPROACH (APP) and was squawking 7000 with Mode C. His ac was coloured red/blue, and the anti-collision beacon was on; TCAS was not fitted. About 4nm SW of Milton Keynes, the right seat occupant (a PPL holder) saw the other ac about to pass underneath from the 5 o'clock direction and shouted "maintain altitude, traffic passing underneath". There was no time to take avoiding action, and the other ac passed about 30ft below with a "very high" risk of collision.

When the other ac called on frequency [its registration had been clearly visible], the PA28 pilot asked him directly if he had seen his ac, to which the TB20 pilot reported that he had not. The pilot informed APP that he would be filing an Airprox report.

THE TB20 TRINIDAD PILOT reports heading 060° at 135kt in an en route descent inbound to Cranfield where he was intending to land. His ac was coloured blue/white and strobes were on. Transponder was fitted and Mode C was selected on, though no code was reported [UKAB Note (1): Only primary radar returns are seen on the radar recordings]. TCAS was not fitted. The pilot did

not see the PA 28 but described his inbound route to Cranfield. Due to a misunderstanding of the ATIS instructions, he called initially on Cranfield Tower (TWR) frequency and was directed to call APP. He was descending and reported his height as 2000ft when first calling TWR and then as 1800ft when calling APP. He was informed that the PA28 was at 2400ft and based on this did not see how there could have been a risk of collision. He stated in his report that "...pilots like myself take the view that if they are in receipt of a flight information service they do not need to look[out] so much as if they are non-radio". However, he also reports that Cranfield was very busy at the time and that they were "not going to be able to provide a meaningful service". The call from the PA28 pilot was heard but was ignored as it was not routed through ATC. The pilot believed that there was "no satisfactory reason to call an Airprox".

UKAB Note (2): The Cranfield Approach controller reported "light traffic conditions" during the period concerned.

UKAB Note (3): Analysis of the Debden radar recording shows only the PA28 initially, inbound to CFD and squawking 7000 with Mode C. At 1103:15 a primary return, identified as the TB20 "pops up" about 0.5nm south of the PA28, also tracking towards Cranfield. At 1104:05 the TB20 turns onto a northerly heading and the two tracks merge at 1104:16. The TB20 continues on this northerly heading for about another 1nm before turning right towards Cranfield once again. The Heathrow radar recording shows the TB20 primary return visible from a much earlier stage, during which time it slowly closes on the PA28 from the 5 o'clock position. The primary return becomes intermittent as the TB20 turns onto the northerly heading just prior to the Airprox.

UKAB Note (4): The TB20 pilot does not report the turn seen on the radar recordings, and relates the vertical separation with the PA28 to his indicated altitude (he reports flying on Cranfield QNH) at the time he was informed by APC of the PA28. At this stage he believed he was some 600ft below the PA28 and thought the reported Airprox had only just occurred. However, if the TB20 had been descending en route for some time it is quite likely that the two ac could have been at similar altitudes at the point where radar shows the plots merging. Furthermore, had the

TB20 been descending towards the PA28's altitude as it closed from behind, the PA28 may have been obscured by the ac nose until late so reducing the TB20 pilot's opportunity to see it before he passed close below it. This scenario does not fully fit with the observed Debden recording which shows the TB20 "popping up", suggesting that it might have been at a lower altitude, but it is supported by the Heathrow recording. This shows a steady primary return which becomes intermittent as the TB20 is known to descend below about 2200ft.

ATSI reports that the PA28 pilot established comms with Cranfield Approach, a non-radar unit, at 1059, and requested transit overhead Cranfield at 2400ft. The Cranfield Approach controller advised that the flight would be provided with a FIS, issued the Cranfield QNH, 1020mb, and requested the pilot to report when 3nm to run to the Cranfield overhead. The radar recording indicates that the Airprox took place at about 1104:16, which was about 1 minute before the TB20 pilot addressed his first call to the Cranfield Aerodrome controller (ADC). The pilot reported that the flight was inbound to Cranfield at 2000ft with ten miles to run and requested joining instructions. ADC acknowledged the call and instructed the flight to contact Cranfield Approach. Thirty seconds later, the TB20 pilot called on the APC frequency, repeating his details except this time reporting his altitude as 1800ft. The flight was provided with a FIS and instructed to report at WOBURN VRP, to the south of Cranfield. As the Airprox took place before the TB20 called on frequency, no traffic information could be passed which may have prevented it. A short RT exchange took place between the ac, after which the PA 28 pilot advised APP that he would be filing an Airprox.

Regarding the comment in the report from the TB20 pilot about what can be expected from a FIS, reference should be made to UK AIC 2/2001 (Yellow 33) 11 January – SERVICES TO AIRCRAFT OUTSIDE CONTROLLED AIRSPACE para 5.2. which states:

FIS is a non-radar service provided, either separately or in conjunction with other services, for the purpose of supplying information useful for the safe and efficient conduct of flight. Under a FIS the following conditions apply:

AIRPROX REPORT No 148/02.

(a) Provision of the service includes information about weather, changes of serviceability of facilities, conditions at aerodromes and any other information pertinent to safety;

(b) 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;

(c) controllers are not responsible for separating or sequencing aircraft.

FIS will be provided by any ATSU to the extent of the information available and is subject to controller workload. Pilots should note that traffic information received while under FIS may be inaccurate or incomplete because many aircraft on a multiplicity of tracks and levels without communicating with ATSUs; moreover, position reports may be unreliable in the absence of accurate navigational aids. In view of this, pilots are recommended to ask for a Radar Service, rather than FIS on its own, whenever such a service is available. ATSUs automatically provide FIS as an integral part of RAS, RIS or Procedural Service."

In addition, the CAA General Aviation Safety Sense Leaflet 8D para 2, FIS, advises

"Remember that use of FIS is not intended to replace pre-flight planning, nor is it intended to be a comprehensive source of information on the presence of other aircraft. The controller may be able to provide information on aircraft in your vicinity that have contacted him, but it is most unlikely that he will be aware of all aircraft that may affect your flight, ie: warnings of conflicting traffic are far less likely to be given under a FIS than under a RAS or RIS."

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board considered the known facts to try to determine why the TB20 pilot would not have seen the PA28. It was known that he was in an en route descent and that he closed on the PA28 from its 5 o'clock position. Although there would have been little relative motion initially, the other ac should have been in view for quite some time. It was possible that the PA28 may have been obscured by the TB20's nose, but this is a known problem in such ac and basic airmanship dictates that a descending pilot takes measures – such as a gentle weave - to ensure his flight path is clear. Another possibility was that the pilot may have been distracted by other tasks, such as noting down the ATIS details (the temporary heading change onto north may support this) so reducing his lookout; but this did not explain why the PA28 was not seen at all.

Although the TB20 pilot had not contacted Cranfield at the time of the Airprox, the Board felt strongly that his total misunderstanding of what a Flight Information Service entails should be highlighted, and that this Airprox should receive wide publicity. It was acknowledged that much effort had gone into publicity on the subject, and that the CAA held frequent GA Flight Safety meetings which specifically addressed this issue. However, although such meetings were well attended, it was often the case that those most in need of education were the least likely to attend.

Many agreed that the nomenclature of the FIS could be misleading for inexperienced pilots who, as this incident revealed, may believe that they were receiving more of a service than was the case. However, this does not absolve a pilot from understanding the services available and their limitations.

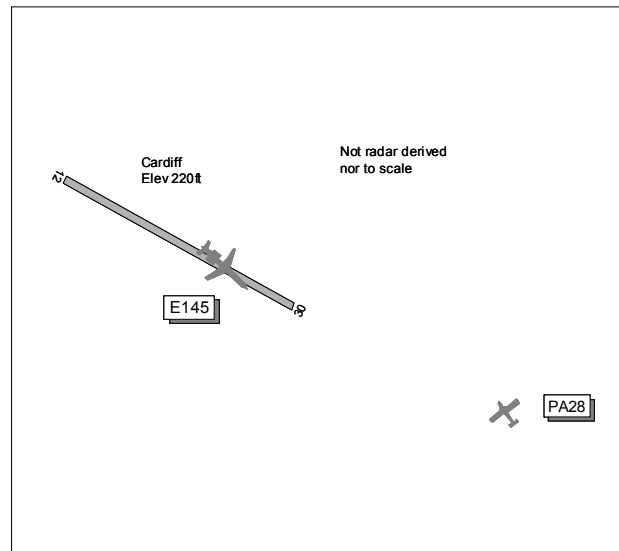
Although the TB20 pilot did not think that an Airprox had occurred, all the available information pointed to the contrary, and that the separation between ac had been very little. There was no doubt that the responsibility lay with the TB20 pilot to see and avoid the PA28, which was being overtaken. The Board were concerned that, not only had he remained oblivious to the PA28's presence when he underflew it, he had exhibited a worryingly poor knowledge of Air Traffic Services and his own responsibilities as Pilot in Command. The outcome had been a high risk situation in which an actual risk of collision had existed.

PART C: ASSESSMENT OF CAUSE AND RISKDegree of Risk: ACause: Non-sighting by the TB20 pilot.**AIRPROX REPORT NO 150/02**Date/Time: 27 Aug 1014Position: 5123N 0320W (RW12 at Cardiff - elev 220ft)Airspace: ATZ/CTR (Class: D)Reporting Aircraft Reported AircraftType: E145 PA28Operator: CAT Civ ClubAlt/FL: ↑2500ft 650ft↓
(QNH 1022mb) (QFE 1015mb)Weather VMC HZBC VMC CLBCVisibility: 16km 17kmReported Separation:

300ft V 0.75nm H NK

Recorded Separation:

not recorded

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

THE E145 PILOT reports lining up for departure RW 12 at Cardiff with take-off clearance from Cardiff TOWER on 125.0MHz. He had previously heard ATC instruct another ac (the subject PA28) in the RH visual cct for RW 30 to hold on R base. Passing V1 during the take-off roll, the FO (PF) spotted an ac making an approach to RW 30 as it appeared out of the haze whilst simultaneously, ATC issued a R turn to the light ac to turn off its approach. He saw the light ac responding to the ATC instruction so he continued with his take-off, executing a R turn through 30° at 100ft agl. The other ac passed 300ft above and 0.75nm to his L and he assessed the risk of collision as high. No TCAS alerts had been received during the incident.

THE PA28 PILOT reports flying solo on a local sortie from Cardiff squawking 3636 with NMC and in receipt of an ATS from Cardiff TOWER on 125.0MHz. The visibility was 17km below 1-2 octas of cloud, base 2200ft, and the ac was

coloured blue/white with strobe lights switched on. When inbound to the airport, he reported R base and was given "number 1 report final" by ATC. Having just turned onto final approach RW 30 at 650ft QFE (1015mb) and 75kt, he noticed an ac's nose light on the RW pointing towards him, he was not sure whether it was stationary or moving. Because of this, he reported on final, earlier than usual, and he was told to "break right", which he did immediately and carried out a missed approach. During the R turn, he glanced over his L shoulder and last saw the E145 still on the RW or possibly just about to get airborne. The RW in use was 30 but he had heard on the RT an ac being given clearance to use RW 12 so he was aware early of other traffic in potential confliction. However, as he had been told by ATC that he was No 1, he had assumed that the other traffic would be departing after he had landed; he had not heard ATC issue take-off clearance to the E145. He assessed the risk of collision as low.

AIRPROX REPORT No 150/02.

UKAB Note: Met Office archive data shows the Cardiff METAR 0950Z EGFF 24006KT 210V270 CAVOK 17/13 Q1022= and at 1020Z EGFF 23006KT 200V260 CAVOK 18/13 Q1022=

ATSI reports that the ADC was operating with a trainee, who, having recently completed his Aerodrome Course, was on his first week of six weeks On the Job Training (OJT) at Cardiff. The ADC commented that, as it is a regular occurrence for this type of trainee to be sent to Cardiff, he was used to monitoring them. He went on to say that, although these trainees could generally cope with 'straightforward' RT calls e.g. passing clearances and responding to position reports in the circuit, in view of their inexperience, it was normal to have to prompt them at other times. In accordance with local ATC procedures relating to 'Six Week OJT' trainees, the mentor was using a Training Box. This was plugged in to the headset socket situated to the R of the trainee, consequently necessitating the mentor sitting to his R. The mentor described his workload as medium at the time of the incident.

The Cardiff Airport weather observation, timed at 1025, reports: surface wind 240°/07kts; visibility 17km with nil weather, cloud scattered at 2200ft.

At 1002, the E145 requested pushback and engine start on the Tower frequency, together with use of the non-duty RW i.e. 12, instead of the promulgated 30. Following co-ordination with APC, the RW 12 departure was approved and, five min later, the flight was cleared to taxi to that RW's holding point. Whilst it was taxiing, at 1008:30, the PA28 established contact with Cardiff Tower, requesting rejoin, from a local flight, via Cardiff Docks. This is a promulgated VRP, situated ENE of the airport, outside the Cardiff CTR/CTA. Because the assigned SSR code for this flight had been code/callsign converted, in accordance with local procedures, the APR had transferred the ac, without reference to ADC, for joining clearance. The trainee cleared the ac to join R base for RW 30. Approximately two minutes later, the E145 was issued with its ATC clearance to climb on track for EXMOR, climbing to FL90.

The mentor explained that, in order to avoid delay to the departure, his plan was to hold off the inbound PA28 until the E145 was airborne. However, when the PA28 reported on R base, the

trainee, without reference to the mentor, cleared it to final number one. The mentor immediately prompted the trainee to instruct the ac to hold on base leg, although, as explained later in the report, its exact position was never established. Accordingly, the trainee transmitted "*....correction orbit left in your current position until advised*". The RT recording of the Tower frequency reveals that, at the time this call was made, there was a simultaneous transmission, followed by an unintelligible communication, but no detectable response from the PA28 pilot. The mentor said that he believed that the PA28 had responded to the instruction to hold on base leg. He added that, at the time the reply was expected, he had been occupied, not only with monitoring his trainee's actions but also listening to a telephone call from APP restricting the E145's departure to 2500ft on RW heading. Consequently, his full attention had not been concentrated on the RT. Having heard what he thought was a response to the instruction to hold on base leg, he erroneously assumed that it had been an acknowledgment by the pilot of the PA28.

The E145 was cleared to line up on RW 12 and was passed its amended clearance. Having received a correct readback to the revised clearance, the trainee, at 1013:15, cleared the E145 for take-off. No mention was made about the PA28 holding on base leg for RW 30. Thirty seconds later the PA28 reported "*on final for three zero*". The mentor immediately instructed the ac to "*break right immediately break right immediately*". The mentor said that he reasoned that to instruct the ac to break right immediately would have a more immediate effect than using the avoiding action phraseology, adding that before he had finished the transmission the PA28 was already in the R turn. The E145 took avoiding action by commencing a R turn at about 100ft.

The mentor commented that he had only become aware of the developing situation when the PA28 was on final approach to RW 30, the E145 having already been cleared for take off on RW 12. He recollected that his trainee had pointed out that the former ac was on final approach but he could not remember if this was before or after receiving the 'final' call. He explained that, having heard what he believed was an acknowledgement from the pilot of the PA28 to the instruction to orbit on base leg, he believed that the potential confliction

between the subject ac was resolved in accordance with his plan. He added that he had looked for the PA28 visually to confirm it was holding but, because of haze looking into sun, he had not been able to see it. Additionally, from his position seated to the R of the trainee, he was not able to view the ATM clearly, as it was affected by sunlight shining on the screen. He commented that, as it is a fixed item, it cannot be turned to face the mentor position. He agreed that he would have had a better view if he had stood up and moved closer but added that to do this on every occasion he wanted to see the display would have meant moving position almost continuously. He had assumed that, the pilot of the PA28, being locally based, having received the instruction to hold on base leg, because of the presence of a number of suitable geographical features, there would be no chance of him straying towards final approach. Consequently, although not able to see the ac either visually or on the ATM, but erroneously believing that the pilot of the PA28 had acknowledged the holding instruction, he had considered that the situation had been resolved safely.

As a result of this incident the 'mentor box' desk socket has been moved, to allow the mentor to sit to the L of the trainee and, consequently, to have a clear view of the ATM.

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.

From the outset, there appeared to be several assumptions made by both ATC and aircrew during this incident. Firstly, the ADC Mentor had never established the exact position of the PA28 when he told his trainee to instruct its pilot to '*orbit left in your current position*' and then, pivotally, had assumed that the simultaneous transmission indicated the pilot's acknowledgement. The OJT scenario is well known to members, with close monitoring of trainees being required at all times but particularly during the early stages of training, as in this case, owing to their lack of experience. Secondly, the ADC had assumed the PA28 pilot

had complied with the instruction, without either confirming visually or by reference to the ATM that he had done so. Acknowledging that the seating position adopted by the Mentor had been less than ideal for viewing the ATM within the VCR, the onus remained on him to ensure the safe operation of the ADC position utilising all the available 'tools' at his disposal. ATCO members thought that the ADC should have instructed the PA28 pilot to hold on 'base leg' or at a known geographical position within the visual cct area pattern. This would have ensured greater clarity to all parties concerned with respect to known positions relative to the RW. Furthermore, the ADC did not pass TI to either crew. The E145 crew had heard the 'orbit' instruction being passed on the RT to the PA28 pilot so were aware of its presence. However, this had led to a third assumption, by the E145 crew, that the PA28 was holding on base leg, to the N of the RW 12 climb-out, prior to the E145 crew commencing their T/O roll but without them acquiring it either visually or on TCAS. Pilot members thought that the PA28 should have been displayed on TCAS during the T/O roll but explained that the crew would have been busy with other priorities during this critical initial period of the flight. Similarly, the lack of TI to the PA28 pilot had denied its pilot the situational awareness of the ADC's plan to delay his arrival until after the E145 had departed. Although he had heard the E145 being given clearance to use RW12 for departure, he had missed the subsequent T/O clearance to its crew. Consequently, he had continued with his approach in the belief that he was No 1, unaware of the 'orbit' instruction addressed to him and the amended traffic sequence. For his part the ADC had not ensured that a positive readback was obtained. This series of omissions and errors cleared the way for the conflict to happen. Taking all of these factors into account, members agreed that the Airprox was caused because the ADC Mentor allowed his trainee to clear the E145 for T/O into conflict with the PA28.

Once things were in motion, the ADC only became aware of the conflict when the PA28 was established on finals and he had immediately given instructions to break off its approach. The PA28 pilot had made an early RT call on final because he saw an ac's nose light on the RW pointing towards him - a significant clue that all was not as it should be. He quickly executed the 'break right', as instructed, turning away from the

AIRPROX REPORT No 151/02.

extended C/L during his missed approach, seeing the departing E145 over his L shoulder. The E145 crew were surprised to see the PA28 ahead on their climb out path but after seeing it turn away, when it was told to do so by ATC, they had elected to continue with their departure, executing a 30° R turn once airborne to avoid. These prompt actions executed by all parties had ensured that any risk of collision had been effectively and safely removed.

The NATS advisor informed the members that following this incident, a Local Safety Notice (LSN02/02) was issued at Cardiff. This

highlighted the salient ATC factors, including any remedial action that was planned or had taken place which was worthy of note to mentors in the ADC position.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Cardiff ADC Mentor allowed his trainee to clear the E145 for take-off into conflict with the PA28.

Degree of Risk: C

AIRPROX REPORT NO 151/02

Date/Time: 26 Aug 1551

Position: 5118N 0115W (6nm N PEPIS)

Airspace: UAR UB321 (Class: B)

Reporting Aircraft Reported Aircraft

Type: B737 Untraced Balloon

Operator: CAT NK

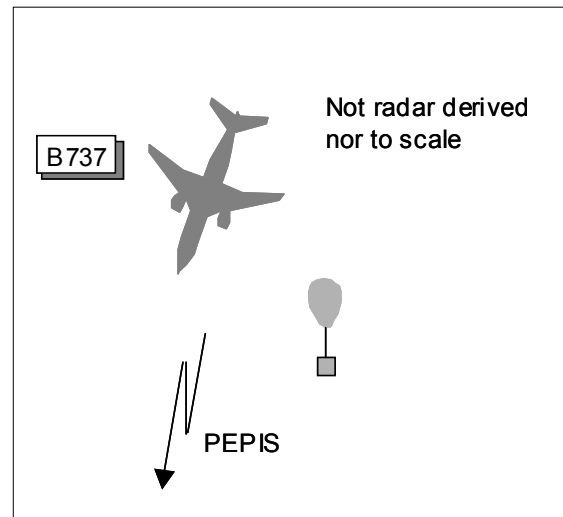
Alt/FL: FL325↑

Weather VMC CLAC NK

Visibility: NK

Reported Separation:
0ft V 100m H

Recorded Separation:
not recorded



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE B737 PILOT reports heading 200° at M0.74 climbing to FL350 and in receipt of ATS from London on 129.42MHz. On climbing through FL325 in VMC on top of cloud, a weather balloon was seen to pass approx 100m down his LHS; about 3-5 sec had elapsed between first seeing the balloon and its passing clear making 'avoiding action' manoeuvring impractical. The balloon was coloured yellow, 50cm diameter with a small box like structure dangling 25cm beneath it. He informed ATC of the encounter and assessed the risk of collision as medium.

UKAB Note (1): The RT transcript at 1551:40 reveals initial call from the B737 pilot as "and London B737 c/s er just had a weather balloon whistle down the lefthand side of us abou-about level three two five about er thirty seconds ago". This was acknowledged by the controller and a few min later the ac was transferred to another LACC sector. Following a subsequent request from ATC for further information, the B737 pilot transmits er it was er it appeared to be a yellow balloon with er some sort of device hanging just below it er size I would say er probably one or two foot er diameter maximum and it was heading er

north past us at level three two five something like that".

UKAB Note (2): The UK AIP ENR 1-1-5-5 Airspace Restrictions, Danger Areas and Hazards to Flights para 3.5 Radiosonde Balloon Ascents details launch sites within the UK and describes the typical balloon as either being of 1.5m diameter coloured off-white to brown or 100 gm weight coloured red, both attached to small parachute and a 390 gm radiosonde package by a 33m suspension string. The UK Met Authority carried out an investigation, initially analysing the synoptic weather situation. A ridge of high pressure extended over southern UK with a mainly north-easterly airflow (average 20kt) would indicate that the balloon was likely to have been launched approx 10-15nm to the NE or ENE of the reported incident location. The Met Office had not launched any radiosonde balloons in or upwind of the area around the incident time and Reading University (13nm NE of incident) had not launched any balloons for 4 months prior to the incident date. Further enquiries through AUS and DAP did not uncover any reports of breakaway balloons or notified mass launched helium balloons. Consequently, the origin of the balloon could not be identified.

UKAB Note (3): Analysis of the radar recording clearly shows the B737 tracking 200° towards PEPIS climbing to FL350 but no other unknown radar returns are observed during the ac's transit of the area that could be correlated to a slow moving balloon.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilot of the B737, transcripts of the relevant RT frequencies, radar video recordings and reports from the appropriate operating authorities.

Members were dismayed that this had been the 4th encounter in the year involving a balloon,

where all of the reported balloons had gone untraced. The B737 crew had reported seeing a yellow balloon (with an attached box) which could possibly have been a translucent/off-white radiosonde balloon reflecting the sunlight but this type of weather balloon had not been released in the area. The given description of envelope size of 50cm and vertical spacing of 25cm to the attachment below does not correlate to a radiosonde balloon type with 33m of suspension string between the balloon and package. This led members to believe that it might not have been a weather balloon type that was seen by B737 crew, who had been presented with a 'fait accompli' situation - the pilot saw a balloon late, watching it pass 100m on the LHS, with no time to avoid if need be. It is known that during this type of 'snapshot' sighting, distances/sizes are notoriously difficult to judge when flying in clear air with few visual clues or depth of field by which to gauge objects against. Without any other corroborating information, members could only conclude that this had been an encounter with an untraced balloon, possibly a weather balloon, in Class B airspace.

MOD and CAA, in their response to a UKAB recommendation 97/02, believe that any damage that might be caused by colliding with a radio sonde would be minimal. However, this encounter may not have involved a weather balloon as all known release sources were eliminated during tracing action. Therefore, with insufficient information available on the balloon type and its aerodynamic properties relative to an ac's flight path, the Board were unable to assess the risk of collision.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict with an untraced balloon, possibly a weather balloon, in Class B airspace.

Degree of Risk: D

AIRPROX REPORT No 152/02.

AIRPROX REPORT NO 152/02

Date/Time: 29 Aug 1507

Position: 5459N 00212W (4nm WNW Hexham)

Airspace: London FIR/ (Class: G)
UKDLFS LFA12

Reporting Aircraft Reported Aircraft

Type: PA28 F15E x 3

Operator: Civ Club Foreign Mil

Alt/FL: 2000ft 1300ft
(RPS 1010 mb) (Tyne RPS 29.77in)

Weather VMC CAVOK VMC NK

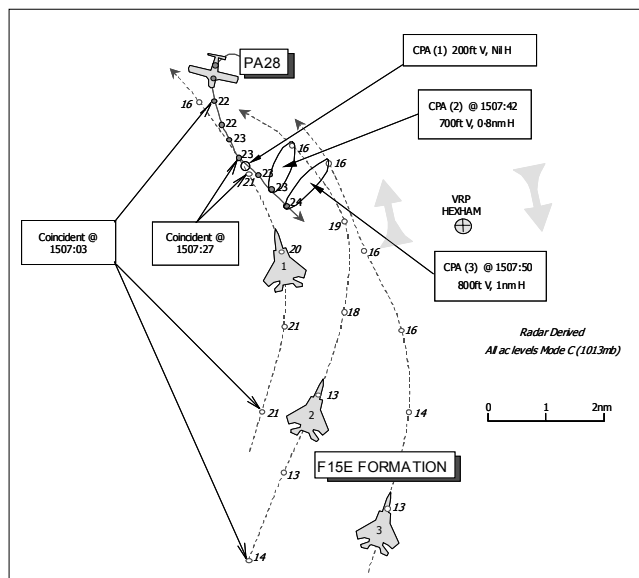
Visibility: 25km NK

Reported Separation:

200ft V, Nil H 200ft V, 770ft H

Recorded Separation:

200ft V, Nil H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE PA28 PILOT reports that he was PNF on an instructional sortie and in receipt of a FIS from Newcastle Radar on 124.375MHz with SSR Mode A Code 3750 and Mode C selected on. Whilst cruising in good VMC at 2000ft (RPS 1010mb) [UKAB Note: The PA28 pilot had been passed the Tyne RPS 1009mb by Newcastle Approach on initial contact at 1452.] and hdg 150° at 95 kt, he was warned by ATC of possible military ac in conflict. He sighted 3 F15s at about 5nm. These then turned towards him and he was unable to avoid them because of their speed. He took no avoiding action. They passed about 200ft below, one directly beneath and one either side. He assessed that risk of collision had been high. He adds that his ac was coloured grey and white and was equipped with wingtip strobe lights, which were on.

THE F15 FORMATION LEADER reports that he was leading a flight of 3 F15Es in 'Vic' with Nos 2 and 3 about 2nm in trail. They were in LFA12 and hdg 030° towards Hexham, in accordance with the flow arrows for the Newcastle Gap, and in contact with Spadeadam Range control on 369.15MHz prior to entering the Range. All ac were camouflaged dark grey and HISLs were selected on. They were flying at 1300ft agl (RPS

29.77ins) and 400 kt, when a light ac was sighted one nm on the nose. The Formation Leader bunted and the light ac passed to his R and above. He estimated that his slant range to other ac was 800ft. The pilots of Nos 2 and 3 also saw the light ac at about the same time as the Formation Leader and turned L and descended to avoid it. Minimum separation distance between them and the other ac, the PA28, was about one nm.

THE NEWCASTLE APPROACH RADAR (APR) CONTROLLER reports that he was providing a FIS to a PA28 on a local cross-country flight routing Newcastle – Hexham - Durham. At approximately 1506 he observed 3 contacts, squawking 7001 at 3000ft on Mode C, approaching the PA28 from the S. He passed traffic information to the PA28 pilot who reported traffic in sight. The 7001 squawks then changed to 2601/2/3 about 3nm SE of the PA28 and, at that stage appeared to be passing well down the port side of the PA28. The lead ac then turned L towards Spadeadam Range and the PA28. After the jets had passed he commented to the PA28 pilot that it had looked close on radar. The pilot agreed and advised that he would be filing an Airprox report.

UKAB Note (1): The recorded speech transcript of frequency 124.375MHz reveals that at 1506 Newcastle APR advised the PA28 pilot *“Traffic information for you. You got, er, 4 fast jets approaching the Gap from the S at 2500ft. They’re S of you by 5 miles this time, I’ll keep you advised.”* The PA28 pilot responded *“Roger copied thanks. We’ve, er, just about to turn on to a southeasterly hdg now.”* APR then updated the traffic information advising the PA28 pilot *“... those fast jets are now S of you by, er, 3 miles similar level and, [1507 time signal] er, should be crossing your nose R to L.”* To which the PA28 pilot’s response was *“And we’re visual thanks ...”*

MIL ATC OPS reports that the F15 formation leader established contact with Spadeadam at 1504:48, when 10nm S of Hexham, requesting to fly through the Range for Radar Warning Receiver checks. The formation was allocated SSR Mode 3/A codes of 2601, 2 and 3 respectively, at 1506:11, and cleared to enter EG D510. At 1507:22 the formation leader reported at Hexham VRP and the Spadeadam controller placed the formation under FIS. It is believed that Newcastle ATC contacted Spadeadam Range for traffic information at 1508:36, although the initial part of this landline conversation is obscured by an ac transmission. The conversation concludes, however, with Spadeadam informing Newcastle *“...that’s 3 F15s just running through on one run, from E to W”*. Thereafter followed a sequence of task-related transmissions between Spadeadam and the F15s. Subsequently, at 1510:19, the Newcastle Supervisor rang Spadeadam to advise that the F15s had come close to an ac working Newcastle and its pilot would be filing an Airprox.

In his written report, the Spadeadam controller stated that he was using primary radar data only; SSR data was unavailable as the MSSR microwave link was unserviceable. Nevertheless individual SSR codes were assigned to the F15s for range tracking purposes. However, the vicinity of the Hexham Gap is a known area of poor radar performance and consequently no radar contact was established with the F15 formation until the ac were entering EG D510. Similarly, the Spadeadam controller had no knowledge of the PA28.

HQ 3AF comments that both the PA28 and the F15 formation were operating in Class G airspace under FIS from different units and moreover, both

were using the Hexham VRP. The PA28, with the help of radar-derived information from Newcastle, saw the F15s at a range of 5nm and did not take avoiding action; the leader of the F15 formation acquired the PA28 visually at a range of 1nm and took avoiding action in order to increase the existing height separation. The principle of 'see and be seen' worked. On the other hand it could be argued that, at the time that Newcastle ATC contacted Spadeadam, had both units taken the opportunity to exchange full traffic information the F15 formation might have received sufficient warning to be able to avoid the PA28 by a margin greater than the reported 800ft.

UKAB Note (2): Met Office archive data reveals that the Tyne RPS for 1500 – 1600 was 1008mb, which equates to 29.77in.

UKAB Note (3): Analysis of the Great Dun Fell radar data recording shows the PA28, on a Mode A squawk 3750 with Mode C displaying 023, 4-6nm to the NW of the Hexham VRP in a LH turn, whilst the F15E formation, squawking Mode 3/A 2601-3 respectively, is SW of the Hexham VRP tracking NE with the formation leader 2-7nm ahead of No 2 and the latter 2.6nm ahead of No 3. At 1507:03 the lead F15E, hdg NE and displaying 021 on Mode C, is 5-25nm S of the PA28, which displays 022 on Mode C. At 1507:11 the lead F15E is 1 o’clock to the PA28 at 3-8nm. On the next sweep, timed at 1507:19, the lead F15E has turned L towards the PA28. At 1507:27, the lead F15E, showing 021 on Mode C, is slightly L of the nose range 0-3nm from the PA28, which displays 023 on Mode C. CPA, though not shown, is assumed to have occurred immediately afterwards as the lead F15E passes 200ft beneath, as described in his report by the PA28 pilot. Meanwhile, Nos 2 and 3 also turn L towards the PA28; both pass to its L, No 2 at a range of 0-8nm and 700ft below, at 1507:42, and No 3 at one nm and 800ft below at 1507:50.

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 recording, reports from the air traffic controllers involved and reports from the appropriate ATC and operating authorities.

AIRPROX REPORT No 152/02.

The Board discussed information available to the pilots of the subject ac. The GA pilot member advised other members that the PA28 pilot had subsequently declared that he was aware of the UKDLFS flow arrows at Hexham, but on this occasion had elected to position himself in a counter-direction because of specific requirements of a one-off navigation exercise. Having placed himself against the traffic it was unsurprising that he met it head-on. The PA28 pilot, warned by Newcastle APR, visually acquired the F15s at 5nm but was then poorly placed to avoid the fast moving formation when it turned directly towards him. For his part, the F15E Formation Leader was obliged to follow that particular flight path, iaw the UKDLFS flow arrows, but was unaware of the presence of the PA28. However, as the UK LFS adviser reminded members, the Formation Leader was also obliged to contact Newcastle Approach iaw UK Mil AIP LFA 12 Regulations. [UKAB Note: LFA12, Flow Systems, states "*The Newcastle CTZ/LFA13 Gap. Ac using the area between the Newcastle CTZ and LFA13 are to observe the following procedures:*

Northbound Flow. Northbound traffic are to route to the west of Hexham. Aircrews are to call Newcastle App on 284.6 or 124.375 MHz 2 mins prior to the gap stating their position, altitude and

intended track. Aircrews are to maintain contact with Newcastle App until north of the CTZ."]

Had he done so, doubtless he would have been advised of the presence of the PA28 and, having been forewarned, may have been able to afford the PA28 a wider margin. As it was, the Lead F15E pilot only acquired the PA28 at one nm range, probably as a result of it being head-on and difficult to see; this would have provided minimal reaction time. Nevertheless his vigorous reaction resolved the situation, although minimum separation, as reported by the PA28 pilot and corroborated by the radar data recording, convinced the Board that safety of the PA28 and the Lead F15E had been compromised.

PART C: ASSESSMENT OF CAUSE AND RISK

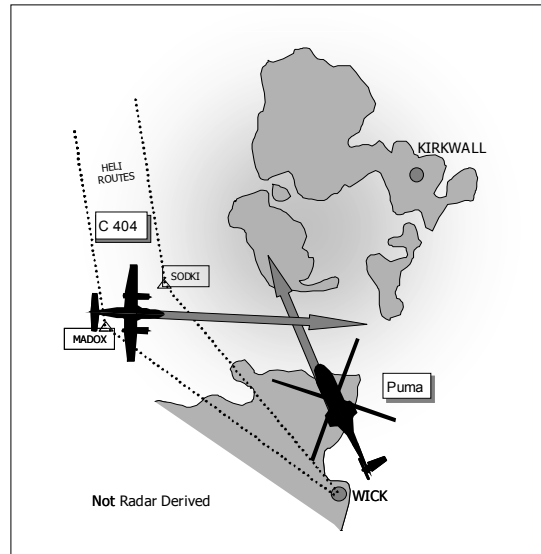
Cause: A late sighting by the Lead F15E pilot.

Degree of Risk: B

Contributory Factor: The F15E Formation Leader did not comply with LFA 12 regulation, concerning the Newcastle CTZ/LFA 13 Gap, requiring him to call Newcastle APR.

AIRPROX REPORT NO 153/02

Date/Time: 31 Aug 0932 (Saturday)
Position: 5842N 0308W (15nm N of Wick - elev 125ft)
Airspace: FIR (Class: G)
Reporting Aircraft **Reported Aircraft**
Type: AS332L Puma Cessna 404
Operator: CAT Civ Comm
Alt/FL: 3000ft 3000ft
 (QNH 1015mb) (RPS 1011mb)
Weather VMC CLBL NK CLAC
Visibility: 8nm 20km
Reported Separation:
 0ft V 200m H, not seen
Recorded Separation:n
 not recorded

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

THE AS332L PUMA PILOT reports that he was flying at 3000ft and 125kt, routing direct from Aberdeen to an oil platform to the NW of Kirkwall. The helicopter was coloured blue/red/white and strobes were on. Transponder with Mode C was on but TCAS was not fitted. He had filed an IFR flight plan and was initially receiving a RIS from ScACC but had been transferred first to Wick and then to Kirkwall Approach. At 0931 Kirkwall reported conflicting traffic (information provided to them by ScACC) which was crossing L to R at 0.5nm range and 500ft above. As the pilot answered the call, the traffic was seen in his 11 o'clock position range 300m at the same level. There was no time to take avoiding action as the low wing twin engined ac crossed his track L to R on a 45° crossing angle, passing within 200m of him with nil vertical separation. The other ac continued in steady flight apparently without seeing his helicopter. At the time, he was 200ft above cloud in between layers and 0.5nm horizontally from cloud, with a visibility of 8nm. The risk was initially assessed as "low" but was raised to "high" after discussion with the company's Managing Pilot. He wondered why ScACC had not continued with the provision of a RIS whilst he transited above/past Wick and Kirkwall as his ac was fitted with 2 radios. In this case, he had accepted clearance from Aberdeen at 3000ft on a direct track, flying off the published

route, on the understanding that his flight was covered by, and on a co-ordinated clearance through, ScACC.

THE CESSNA 404 PILOT reports that he was engaged on a routine maritime patrol along the N Coast of Scotland and was flying VFR on an easterly heading at 3000ft on the RPS 1011mb and 150kt. His ac was coloured red/white and was displaying nav lights and HISLs. Transponder was on with a 7000 squawk and Mode C; TCAS was not fitted. His flight was under a FIS from ScACC on frequency 126.25MHz and he was 'listening out' with Wick [APP/TWR – 119.7MHz] on VHF2. The pilot did not report his flight conditions but states that he was 200ft above cloud, 1500m horizontally from cloud and with an in-flight visibility into sun of 20km. He did not see the helicopter nor receive any information concerning it from ScACC.

THE AS332L FLIGHT SAFETY DEPARTMENT reports that after discussion with the Capt and Training Manager, it was felt that there was an issue with the uncertain/variable quality of ATC radar services being offered/provided on routes over the northern Moray Firth, Caithness and Orkney to the Atlantic Rim oilfields W of Shetland. A Flight Safety Notice FSN was issued highlighting this incident and for the need by the

AIRPROX REPORT No 153/02.

company to address the radar service issue through the appropriate channels. In the meantime, if the weather conditions were good VMC with decent in flight visibility well clear of cloud, there should be no problem in flying direct tracks particularly if the correct quadrantal level could be maintained thereby ensuring better radar coverage at altitude. However, in IMC or marginal VMC at 3000ft, ac commanders should consider the options carefully before flying off the published HMR track structure. These routes are known to other airspace users and thus afford a degree of protection whereas direct tracks have no such benefit.

ATSI reports that the incident took place approx 15nm SW of Kirkwall in Class G airspace. The following report into the civil ATC aspects has been compiled after reference to pilot and controller reports and relevant RT recordings. While no field investigation was considered appropriate, subsequent discussions with ATC personnel have taken place by telephone to clarify points not covered in reports or RT recordings.

The AS332 helicopter was outbound from Aberdeen under IFR on a 'direct' track to the Foinaven platform, located about 90nm NW of Kirkwall. At 0848:30 Aberdeen transferred the flight to the ScACC Moray/Hebrides bandboxed sector. The AS332 reported at 3000ft and was informed that it was identified 'on transfer' and allocated a discrete SSR code. No specific service was requested by the pilot nor offered by the ScACC SC; the latter said he would not have been providing a radar service unless he had stated so on the RT. This situation highlights the importance for controllers and pilots to establish by RT exchange, the service being provided. The AIP page 1-6-1-2, para 3.3, Establishing a Service, states *"In order to establish a radar service the pilot and controller must reach an 'accord'. When requesting a radar service the pilot must state the flight rules under which he is operating and whether he requires a RAS or RIS. If the controller is able to offer a service he will attempt to identify the ac. When he is satisfied that he has positively identified the ac, the controller will confirm the type of service he is about to provide, and the pilot must give a readback of the service. The identification procedure does not imply that a radar service is being provided and the pilot must not assume that he is in receipt of a RAS or a RIS until the*

controller makes a positive statement to that effect. If a controller is unable to provide a service he will inform the pilot. Should the pilot fail to specify the type of service required, the controller will ask the pilot which service he requires before endeavouring to provide any service. This guidance also appears in the MATS Part 1 SI Chap 5 para 1.2. The flight remained on the SC's frequency for the next 30 min on a route coincident with that part of HMR 'Xray' between Aberdeen and Wick. At 0918:40, the SC transmitted to the AS332 *"...would you call Wick please (frequency)"* which the pilot acknowledged. The SC has since explained that as the helicopter was at 3000ft he considered it appropriate to transfer it to Wick as it would be transiting through their overhead. Prior to transfer, he passed the flight details to Wick ATC. The ScACC MATS Part 2, Moray 6.3 states: *"Helicopters operating between Aberdeen and the Atlantic Rim will normally follow the route Aberdeen – Wick – West of Orkney – Destination platform. The route may vary during periods of adverse weather or due to operational requirements. The Moray SC shall co-ordinate, as early as possible, all overflying Atlantic Rim traffic FL45 or below with Kirkwall and Wick. An estimate for west abeam Kirkwall or overhead Wick is to be passed as appropriate. In addition an estimate for MADOX is to be included in the estimate passed to Wick. All revisions of 5 minutes or more must be passed. Overflying traffic must be offered to the airfield unit if there is inbound or outbound traffic which may be in conflict."*

At 0919:10, the AS332 called Wick and reported that it would be overhead at 0920 and maintaining 3000ft on 1007mb. The flight was issued the Wick QNH 1015mb. The pilot stated that he believed he was still receiving a service from Scottish and had just been asked to call Wick *"to transit across the zone"*. The Wick controller advised that Scottish had passed him the flight's details and indicated that the transfer was permanent. The pilot stated that this had not been made clear to him by Scottish, but agreed to remain on the Wick frequency and set the current airfield QNH.

The ScACC Moray/Hebrides SC reports that on his fps display were details of a maritime patrol flight, the C404, operating in the vicinity of Stornoway, with Inverness its final destination. The SC could not recall the flight communicating

and the RT recording confirms that no calls were received in the 35 min after the helicopter made its first call. At 0923, the SC called the C404, twice in succession, to obtain a position update, but there was no reply on either occasion. The ScACC SC then observed traffic near MADOX reporting point (approx 30nm NW of Wick) tracking eastbound towards Kirkwall, squawking 7000 and displaying FL32 on Mode C. Suspecting this was the C404, the SC passed the flight's details to Kirkwall ATC asking them to advise if the flight established contact. This TI was conveyed through Wick to the AS332, whose pilot reported his position as 010°/7nm from the Wick VOR.

At 0928:20, Wick transferred the AS332 to Kirkwall. Just over 2 min later, the C404 established communications with Wick, reporting on marine pollution control, 15nm N of the airport at 3000ft on pressure setting 1011mb. Meanwhile the ScACC SC had observed the developing conflict between the AS332 and the '7000' traffic and provided further TI to Wick, only to discover the helicopter had already been transferred to Kirkwall. Wick warned the C404 about the presence of the helicopter, based on the information provided by the ScACC SC, and then immediately (0931:30) transferred it to Kirkwall.

The AS332, meanwhile, had established communications with Kirkwall and reported at 3000ft on 1015mb, 10.5nm N of Wick. The flight was requested to report to the W of the airport and issued with the Kirkwall QNH 1013mb. At 0931:00, following a further telephone call from the ScACC SC, the AS332 was informed by Kirkwall *"...from Scottish they advise there's an unverified 7000 squawk crossing left to right just ahead of you 500 feet above unverified"*. The helicopter pilot replying *"yeah got him visual..."*. Forty five sec later, the pilot of the C404 called Kirkwall, seeking information about the helicopter, and was informed that he had probably just flown in front of it. This is confirmed by the AS332's pilot, who reports that he saw the ac cross from L to R and that he was currently 16nm N of Wick. The pilot added *"...that was close enough and we are IMC and so was he"*. The helicopter pilot then addressed the C404 stating *"I'm gonna file for that and why are you not working anybody you're flying between two zones"*, to which the pilot of the C404 replied *"I'm working Scottish Information and I've just give(n) Wick a call..."*. The two crews

then agreed to discuss the incident further when on the ground. Before the C404 changed frequency, the pilot of the AS332 asked what pressure setting the former had set at the time of the incident. The other pilot replied 1011mb. The ScACC Watch Manager reports that, sometime after the incident, he was asked by the pilot of the AS332 to replay the radar to ascertain the minimum recorded separation. This was determined as 500ft vertically and 0.3nm horizontally (Note: On a pressure setting of 1011mb the C404 would have been approximately 120ft above the helicopter on 1015mb with both altimeters showing 3000ft. However if the helicopter had set the Kirkwall QNH 1013mb which the pilot readback that vertical difference would have been closer to 60ft).

UKAB Note (1): Unfortunately, as a radar recording was not requested in time through ScACC the original tape was returned to service so a radar analysis of the incident was not 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, reports from the air traffic controllers involved and reports from the appropriate ATC and operating authorities.

Looking at the piloting aspects first, the C404 pilot had reported flying VFR and receiving a FIS from ScACC. Members noted that flying 200ft above cloud at 3000ft was ill advised and would require a pilot to remain in sight of the surface to fulfil the requirements of maintaining VMC. From an airmanship standpoint it left little time to acquire other traffic visually that might be flying close to or emerging from the cloud. Also, the C404 pilot had not established two-way radio contact with the ATCO during the 35 minutes that the AS332 was on frequency nor responded to the controller's calls addressed to him, which would have made the provision of an ATS difficult.

It appeared from the AS332 pilot's report, that he was unclear as to which type of ATC service he was receiving, believing erroneously that he was under a RIS from ScACC throughout. Although he had probably received a RAS from Aberdeen,

AIRPROX REPORT No 153/02.

on transfer to ScACC he was not offered, nor did he request a service from the ATCO. The words used by controller (identified on transfer) may have led him to assume that a radar service would be provided but no specific contract was agreed between both parties at the time. The SC had said that, in his mind, he was only providing a FIS; this had led to misunderstanding from the beginning. However, later on when the Puma was transferred to the two non radar ATSUs, first Wick then Kirkwall, the service from Scottish was terminated and the helicopter pilot should have been aware at that point that only a non radar service could be provided thereafter. The Board agreed with the helicopter's Flight Safety Dept's comments: in electing to fly off an HMR in the FIR the pilot had removed any degree of protection afforded by the route and consequently both the AS332 and C404 pilots were wholly responsible for their own separation through see and avoid. Clearly, both pilots had not managed to do so and members agreed that a non-sighting by the C404 pilot and a late sighting by the AS332 pilot had caused the encounter.

The Puma pilot acquired the conflicting Cessna visually, after twice being passed TI by the ScACC SC through the Wick and Kirkwall controllers, in his 11 o'clock range 300m crossing L to R at about the same level. This had been too late to take avoiding action as he watched the traffic cross obliquely and pass 200m to his R. The C404 pilot was also passed TI by ScACC, via the Wick ATCO, but did not see the helicopter at all. Such pro-active effort by the Moray/Hebrides SC to ensure that both pilots were furnished with radar derived TI was commended by the Board - neither ac was under his 'control' at the time. However, the pilots had still managed to fly into close proximity with only one of them seeing the confliction, but with no time to take any action. This led the Board to conclude that the safety of both ac had not been assured.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Non-sighting by the C404 pilot and a late sighting by the AS332 pilot.

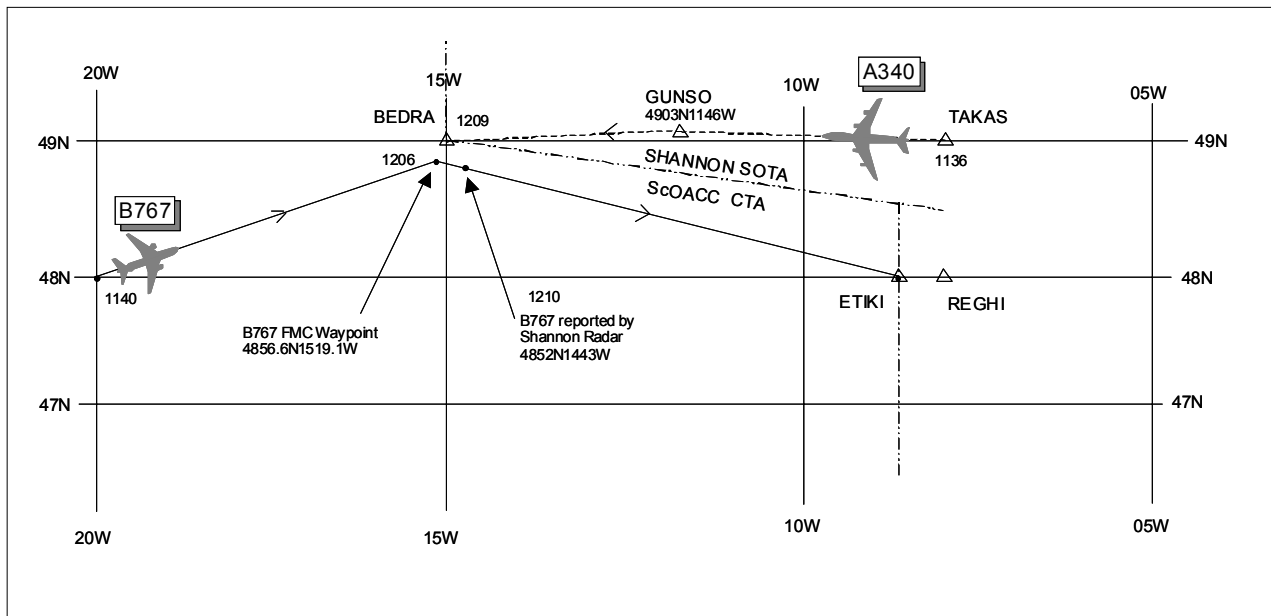
Degree of Risk: B

AIRPROX REPORT NO 154/02

Date/Time: 1 Sep 1210 (Sunday)
Position: 4852N 1443W (15nm SE BEDRA)
Airspace: Shanwick OCA (Class: A)
Reporter: ScOACC ERC

	<u>First Aircraft</u>	<u>Second Aircraft</u>
<u>Type:</u>	B767-300	A340-300
<u>Operator:</u>	CAT	CAT
<u>Alt/FL:</u>	FL350	FL350

Weather VMC NK VMC NK
Visibility: NK NK
Reported Separation:
 NK 8nm H
Recorded Separation:
 not recorded



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE SHANWICK EN-ROUTE CONTROLLER (ERC) reports that he was informed by Shannon RADAR of unidentified traffic tracking easterly at FL350 that was in conflict with opposite direction traffic, the subject A340, at the same level cleared into Oceanic airspace at BEDRA (49N15W). The unknown ac was identified as the B767 on a cleared routeing 48N20W - 48N15W -

ETIKI (48N0845W) who had reported 48N15W at 1206; the westbound A340 traffic reported BEDRA at 1209 estimating 49N20W at 1233. Having been told by Shannon RADAR that the unidentified traffic was squawking 3673 and was tracking SE, the ERC asked the B767 pilot to confirm his position and squawk. The pilot replied "137 miles west from ETIKI estimate ETIKI 1242

AIRPROX REPORT No 154/02.

FL350 REGHI SQ3673". The crew was advised of their radar observed position and were asked to provide an explanation. In their reply the B767 pilot stated that they had received a re-clearance from New York to route 48N20W 48N15W ETIKI, which correlated with the ERC's data; the B767's original plan had been via 48N20W BEDRA. Shannon reported the B767's position at 1210 as 4852N1443W, having passed the A340, whose crew did not report any traffic confliction.

THE SHANNON RADAR CONTROLLER reports the A340 reported BEDRA at 1209 and FL350 established on NAT Track F. Approx 1 min later, he saw unknown eastbound traffic at position 4852N1443W and FL350 squawking 3673. He immediately notified ScOACC who established that the ac was the subject B767 which had been cleared via 48N15W to ETIKI; the ScOACC ERC stated that an Airprox report would be filed.

THE B767 PILOT reports that he was informed by Shanwick about a gross navigational error as he approached ETIKI. He had not been informed about or seen any conflicting traffic and had not received any TCAS alerts.

THE A340 PILOT reports in the cruise at FL350 and M0-82 en route to the USA. Approaching BEDRA he had observed traffic on TCAS at 20nm range which passed clear to his L by 8nm at the same level. Avoiding action was not necessary.

ScOACC ATS INCIDENT AND
INVESTIGATIONS comments that following a discussion with the Shannon Station Manager, it was established that the B767 and the A340, the latter under Shannon's control, were not seen simultaneously on radar. The A340 had routed TAKAS (49N08W) GUNSO (4903N1146W) before fading from radar at about 1448W, prior to reaching BEDRA. The B767 later appeared 22nm SE of BEDRA at 1210:24 flying in the opposite direction and from these extrapolated tracks was deduced a separation distance of 8nm.

ATSI reports that there are no apparent civil ATC implications in this Airprox, which appears to have been caused by a gross navigational error by the crew of the B767 resulting in the ac being in excess of 50nm N of its cleared track. The error was detected by Shannon ATS who observed transponding eastbound traffic at FL350 as it came into radar cover, close to the track of the

westbound A340 at the same level. Shanwick was immediately alerted and the flight was identified as the B767. As the westbound A340 and the B767 were not within radar cover simultaneously, Shannon has deduced by extrapolation that the two ac passed approx 8nm apart.

THE B767 FLIGHT OPERATIONS DEPT reports that the principal cause was confusion by the crew on the FMC legs page between 2 waypoints. In effect, ETOPS exit point N48°56.6 W015°19.1 and N48°00.0 W015°00.0 are both present as N48 W015 on FMC legs page. Approx 3hr after departure, a new PNF in position following crew relief, received reclearance from New York Centre and made FMC modifications accordingly, However, he did not notice that N48 W015 on FMC did not correspond with N48°00.0 W015°00.0, the difference between the two waypoints is 58nm. Following this incident, the crew were given recurrency training on the company NAT and RVSM programmes. Also, all company pilots will receive a copy of the Flight Safety gross navigational error report for information and warning.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Pilot members wondered how the B767 could have flown so far off course. Normally, the only waypoints inserted into the FMC for the active route would be the Oceanic waypoints as given in the clearance. What had complicated the situation here was also having the ETOPS exit waypoint inserted in the active route; this ETOPS point is usually only plotted on an Oceanic chart for reference. The original clearance was 48N20W - BEDRA - ETIKI and the reclearance 48N20W - 48N15W - ETIKI should have required only the substitution of 48N15W in place of BEDRA. However as the ac was programmed to fly from 48N20W to the ETOPS exit point (N48 56.6 W015 19.1) the removal of BEDRA left the active route entry as 48N20W - N48 56.6 W015 19.1 - ETIKI. The display on the FMC legs page gave the crew the impression that 48N15W was

indeed in the active route to replace BEDRA, whereas it would appear that it had not been inserted, and the active leg 48N20W - N48 56.6 W015 19.1 was maintained throughout. As a matter of normal CRM, the change of the waypoint co-ordinates by the PNF in the FMC should have been crosschecked by the PF before executing the input. Additionally, it is normal practice to calculate new tracks, distances and times manually and then for both pilots to check that the active route matches the calculations. However, the B767 appeared to fly almost all of the original flight leg towards BEDRA and then turn at the ETOPS exit waypoint direct to ETIKI, undetected by the crew who erroneously gave their position as 48N15W at the turn.

The error should have been noticed by using NAT standard operating procedures. These require crews to check the next initial true track as the ac approaches each waypoint so as the B767 approached 48N20W the crew should have observed that the next initial true track was programmed about 9° L of the correct track to 48N15W. Also, the distance between waypoints should have been checked and this should have revealed another discrepancy. Members thought that after passing 48N20W the crew should have observed their track error by carrying out a routine position check; normal NAT procedures involve carrying out such a check 10 min after each waypoint. Furthermore, also part of the NAT procedures, is the requirement to check navigation accuracy at the mid point between two waypoints, by plotting the actual ac position on a chart marked with the required track. This should have been redrawn when the crew received their reclearance and would have revealed that the B767 was well N of track, before the error became a hazard to other ac on Oceanic routes. These checks do not appear to have been done. Consequently, the Board were unanimous that a gross navigational error by the B767 crew had

caused the Airprox, as they had not followed established Oceanic procedures.

Unaware of their navigational error, the B767 crew erroneously believed they were at 48N 15W, due W of ETIKI, when their position was queried by the ScOACC ERC; they had not been aware of any other traffic and had not received any TCAS alerts. Meanwhile, the A340 crew, who were working Shannon Radar within the SOTA, had seen the opposite direction B767 throughout on TCAS and had watched it on the display pass about 8nm away at the same level without receiving any alerts. The proximity of the other passing traffic would probably not have caused the crew undue concern, whilst flying within the Shannon radar environment prior to transfer to ScOACC. The ERC was only alerted to the situation by the Radar controller stating the B767's position after the subject ac had passed. Understandably, the ERC had felt that, owing to the prescribed separation being severely eroded, the B767 and A340 were in conflict and that an Airprox should be filed. However, although the B767 had flown >50nm N of its intended track, the geometry of the encounter showed that the subject ac were on diverging tracks as they passed outside of radar coverage. This, combined with the lack of TCAS warnings in either cockpit, was enough to persuade the Board that, at the end of the day, there had been no risk of collision, despite the potential that had existed.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A gross navigational error by the B767 crew, who did not follow established Oceanic procedures.

Degree of Risk: C

AIRPROX REPORT No 155/02.

AIRPROX REPORT NO 155/02

Date/Time: 2 Sep 1512

Position: 5108N 00121E (1.5nm S of Dover)

Airspace: UG1 (Class: B)

Reporter: LACC S15/16/17 & S1/2 Control

Teams

First Aircraft Second Aircraft

Type: B737(A)

B737(B)

Operator: CAT

CAT

Alt/FL: FL290↑

FL290

Weather VMC CAVOK

VMC CAVOK

Visibility: 10km

10km

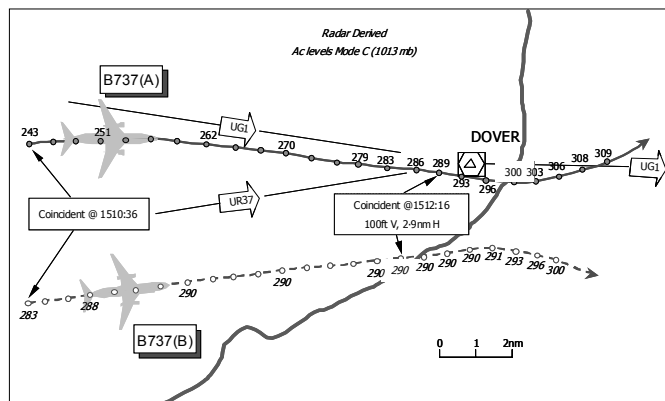
Reported Separation:

Nil V, 2nm H

1000ft V, 1nm H

Recorded Separation:

Nil V, 2.9nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

LACC S15/16/17 TRAINEE TACTICAL (TAC) CONTROLLER reports that B737(B) called on frequency 134.9 climbing to FL230. The pilot was instructed to fly hdg 060° to allow traffic to descend through. When the descending traffic was clear, B737(B) pilot was instructed to turn onto E and climb to FL250 (underneath LACC S25). B737(A) then called on frequency on a radar hdg climbing to FL170 and was instructed to climb FL230 underneath B737(B). B737(B) was then cleared to climb FL290 (underneath LACC S2 airspace) and B737(A) recleared to climb FL270 beneath B737(B). B737(B) was then cleared to FL310 and instructed to contact London on 127.42MHz. B737(A) was then observed to be at FL280 and STCA was flashing. Another ac called on frequency. The call was ignored and B737(A) pilot was asked to confirm his cleared level. He responded that it was FL310 and avoiding action was given.

LACC S15/16/17 TACTICAL (TAC) CONTROLLER reports that he was acting as mentor on the Dover/Lydd bandboxed sector. B737(B) was climbed by the U/T TAC to FL310, he thought, and transferred to LUS iaw co-ordination. B737(A) was climbed to FL270 underneath B737(B). The Mode C of B737(A) was seen to be passing FL285 and avoiding

action given against B737(B), which was maintaining FL290. B737(B), now working LUS, was seen to be given avoiding action also. Prescribed separation was quickly re-established and the ac were transferred to Maastricht.

LACC S1/2 TRAINEE TACTICAL (TAC) CONTROLLER reports that B737(B) was routing eastbound on UG1 at FL290 when contact was established with S2 on 127.42MHz. With no other conflicting traffic known to him, and seeing the fps annotated FL310 with a 'k' written in box D, indicating data transfer to Maastricht at FL310, he gave climb clearance to FL310. Less than one min later, both he and his mentor noticed traffic shown as a background track data block (TDB), partially garbling and 2nm NE on a parallel track passing FL296 climbing; this was B737(A). He gave an avoiding action turn, hdg 120°, and traffic information to B737(B). Within seconds B737(A) had passed FL300, so he instructed B737(B) to stop climb at FL300. Vertical separation was restored very quickly as B737(A) reached and maintained FL310.

UKAB Note (1): Reports were also received from LACC S15/16/17 Planner, S1/2 Tactical Mentor and S1/2 Planner.

THE B737(A) PILOT reports that he was outbound from London Gatwick for Luxembourg and in contact with London Control on 134.9MHz. He was on a radar hdg, climbing to FL270 at M0-76, when he accepted and read back a R turn hdg 105° and a climb to FL310. When passing FL290 he was told to stop climb at FL280 due to traffic 2nm to his R at FL290 and also on a radar hdg. He advised the controller that he was unable to level at FL290 as he was passing FL293 and was visual with the traffic. The controller then turned him left hdg 080° and the ac was levelled at FL310. ATC advised that he had only been cleared to FL270. The frequency was very busy at the time with many blocked transmissions. Neither TA nor RA TCAS indications were received, only a proximity target as his ac passed through the level of the other ac.

THE B737(B) PILOT reports that he was en route from Bournemouth to Dubrovnik under a radar control service from London on 127.42MHz. As he was climbing to FL310, at 280kt on radar hdg 090°, the crew saw a proximity target on TCAS although no alerts enunciated. London then gave avoiding action to turn R hdg 120° and level at FL300, which he did. Traffic, another B737, was then seen 1nm to the L climbing through the same level.

ATSI reports that at the time of the Airprox, B737(A) was under the control of the Dover TAC who was working with a trainee. B737(B), which had been in communication with the Dover Sector, had just been transferred to the London Upper Sector (LUS). The Dover Sector was being operated in a 'band-boxed mode' with Dover and Lydd components combined. Workload was described as 'acceptable' whilst traffic loading was gauged as medium to high. Around the time of the Airprox, the quality of RTF reception from ac was poor and a note to this effect was made on the official transcript. The relevant ATC equipment was all reported to have been serviceable at the time and no other factors were identified that may have adversely affected the controllers' performance.

B737(B) established communication with S15/16/17 trainee TAC at 1504:10, and reported approaching FL230 routeing direct to Dover. Its position was approximately 60nm SW of Dover and trainee TAC instructed the crew to fly a hdg of 060° and then, at 1505:35, instructed B737(B) to

climb to FL250. This transmission, as well as a number of others, was clipped and so only the second part of the company callsign was transmitted with the flt no. During the following 2min, the trainee instructed B737(B) to turn R onto 090° and climb to FL290. Both these transmissions were correctly acknowledged.

At 1507:45, B737(A) reported on frequency passing FL154 for FL170 and heading 095°. The trainee issued a climb instruction to FL230. At that time, B737(B) was 8nm S of B737(A), passing FL250 on a gently converging track. As B737(B) passed FL270, the trainee instructed B737(A) to climb to that level.

At 1510:45, the trainee transmitted "*(clipped) B737(B) c/s climb FL310 turn R hdg 105°*". The reply was "*Climb FL310 R hdg 105 B737(A) c/s*". The trainee's transmission was clear, even though the c/s was clipped, and the c/s of the ac responding was also clear. Neither the trainee, the mentor nor the crew of B737(B) detected that the crew of the wrong ac had taken the call. As there is little similarity between the respective c/s of B737(B) and B737(A), even when the former is clipped, the trainee would have seen no reason to make the crews aware that a similar sounding c/s was on frequency at the same time. Furthermore, even though the numerical elements of the callsigns had common elements, their order and company callsigns were significantly different. It is regrettable, therefore, that the crew of B737(A) took an instruction that was not directed to them. When this transmission was made, B737(A) was 4-8nm due N of B737(B) with B737(A) passing FL246 and B737(B) passing FL285. ROC of B737(A) was in the order of 3000 fpm, whereas that of B737(B) was less than 1000fpm.

B737(B) was instructed to contact the next sector (LUS) at 1511:50 when it was maintaining FL290 with B737(A), which was passing FL274, in its 10 o'clock range 3-5nm. The trainee instructed B737(A) to climb to FL280 and, almost immediately afterwards, noticed that the Mode C readout of the ac was indicating FL285. The mentor stated at interview that activation of STCA first drew his attention to the conflict and the trainee's action was to instruct B737(A) to stop its climb at FL280. The crew reported that they were just passing through FL291 and 'visual'. The radar recording indicates that the 2 ac were separated by only 2-9nm laterally and 100 ft

AIRPROX REPORT No 155/02.

vertically. The trainee then transmitted “B737(A) c/s avoiding action turn L hdg 0(sic)080, there’s traffic in your R half past 3 range of 2 miles, your cleared level was FL270”.

At the same time as this was happening, but unknown to the trainee Dover TAC, LUS TAC had seen the confliction and issued avoiding action to B737(B) in the form of a R turn onto a hdg of 120°. Despite this, lateral separation decreased to 2.5nm before vertical separation was restored.

Analysis of the RTF recording indicates a background noise accompanying virtually every transmission from all ac but not from the controller whose transmissions were clear. However, although the pilot of B737(A) later stated in his report that the frequency was very busy with many blocked transmissions, there is no evidence from the recordings to support this. What was noticeable was that on several occasions, the trainee Dover TAC had to repeat his instructions to ac, including a climb instruction to B737(A), as he received no response the first time he issued the instruction.

Traffic levels pertaining at the time of the Airprox were in excess of the Target Sector Flow for the combined Dover/Lydd sector. When the S15/16/17 mentor TAC was asked at interview whether he believed that traffic loading was a causal factor, he stated that, in his opinion, it was not. The presentation of the traffic made it busy but well within both his and, he assessed, his trainee’s capabilities. However, the mentor’s attention had been fully occupied in closely monitoring the radar and he conceded that he had not had time to check the trainee’s strip marking. In addition, the fact that he also missed the readback by the wrong ac provides evidence that the workload may have been too high to monitor the trainee effectively. However, in the mentor’s opinion, the frequency was no busier than is often found on this particular sector. The mentor stated that he was unaware of the clipped transmissions. He believed that this was due, in part, to the fact that he could hear the trainee directly as well as via the RTF. Although the mentor considered that workload was not a causal factor in this Airprox, it must be remembered that acting as a mentor is a demanding task which involves close monitoring of all the trainee’s actions. It might therefore, have been prudent to request a timely split of the sector,

given the traffic loading, rather than continue operating in a ‘bandboxed mode’.

UKAB Note (2): Analysis of the Pease Pottage radar data recording reveals that at 1510:36 B737(A), squawking Mode A code 0524 with Mode C displaying 243, is tracking E with B737(B), squawking Mode A code 0510 with Mode C showing 283, 4.3nm to the S tracking approximately 085°. At 1511:22 B737(A), displaying 262 on Mode C has turned R 15° onto a converging hdg with B737(B), which is now showing level at FL290. Lateral and vertical separation both erode until 1512:16 when the Mode C of B737(A) is shown at 289, 100ft below that of B737(B); at this point the subject ac are 2.9nm apart. Thereafter, vertical separation increases as B737(A) continues the climb and vertical separation is restored when the ac are 2.5nm apart, although lateral separation continues to reduce until commencement of respective avoiding action turns are evident at 1512:41.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Although the cause of this incident seemed clear enough, it was evident to members that several human and technical issues had contributed to events. Initially members focused upon S15/16/17 workload, particularly with regard to the ability of trainee TAC. A civil ATCO member acknowledged that workload in the bandboxed state may have been high, but nonetheless the mentor had made the judgement that it was within both his and his trainee’s capability; moreover, it was important that trainees be exposed to high workloads during OJT.

Discussion then turned to the reason why the wrong ac had taken the call. The Board noted the statement of the pilot of B737(A) regarding “*blocked transmissions*” and the annotation on the RTF transcript that “*the quality of recorded transmissions made by all ac during the period of extract are poor*”. Any degradation in the quality

of R/T in conditions of heavy R/T traffic may provide some explanation for the confusion. Additionally there was potential for c/s confusion, since both contained common, sequential digits. However, opined one airline pilot member, it was more probable that poor R/T technique (clipped transmissions) had precipitated the confusion, particularly as the crew would have been expecting further climb and may also have been distracted. The fact that B737(A) crew had responded to the call without challenge from ATC, notwithstanding that the call had been addressed to B737(B), may explain why the crew of the latter did not detect the error. Nevertheless, responsibility for completion of the readback loop remained with LACC S15/16/17 TAC and neither trainee nor mentor detected the mistake. As a consequence, despite the sound plan formulated by the trainee, the subject ac converged until the deteriorating situation was drawn to the S15/16/17 Tactical team's attention by STCA.

Members were agreed that timely avoiding action given by both S15/16/17 and S1/2 TAC controllers resolved the situation and removed any risk of collision.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The crew of B737(A) reacted to an instruction addressed to B737(B) which went undetected by LACC S15/16/17 Tactical mentor.

Degree of Risk: C

Contributory Factors:

- a. Poor radio reception.
- b. R/T clipping.

AIRPROX REPORT NO 156/02

Date/Time: 28 Aug 1352

Position: 5221N 0014W (Brooklands Farm)

Airspace: London FIR/ (Class: G)
UKDLFS

Reporting Aircraft Reported Aircraft

Type: Paramotor Chinook x2

Operator: Civ Pte HQ JHC

Alt/FL: 0ft 75ft

Ground level

Weather NR NR VMC CLOC

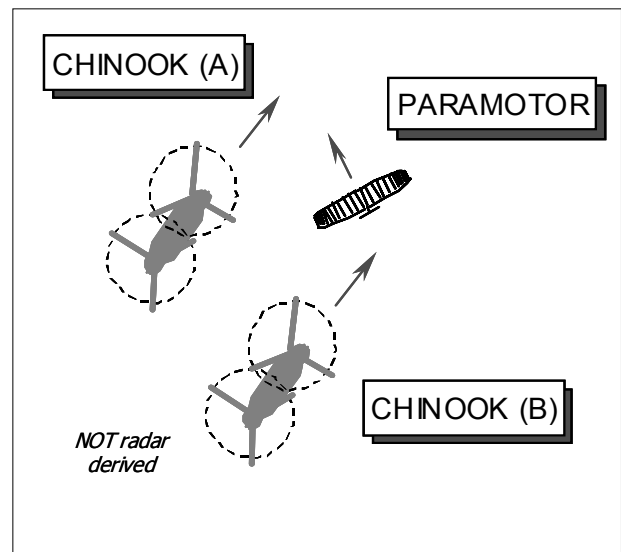
Visibility: NR <10km

Reported Separation:

50m H, 80ft V Not seen

Recorded Separation:

Not recorded



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE PARAMOTOR PILOT reports that he was in the final stages of take-off from Brooklands Farm paramotor & microlight site and about to lift off heading 330°, when two Chinook helicopters were spotted about ½nm away. The helicopters flew straight over the site at a height of about 80ft on a

north-easterly heading. To avoid them, he aborted his take-off, just as one crossed 50m ahead from L – R and the second passed behind. There would have been a serious risk of a 'wing collapse' if he had entered the helicopter's wake

AIRPROX REPORT No 156/02.

and he added that the strip is active in winds of less than 10kt.

He believed that the site was notified to military pilots in RAF low-level flight information publications and had been so noted since 1999, he thought, as an avoidance area.

THE CHINOOK HELICOPTER PILOT reports he was flying one of a pair of camouflage green Chinooks flying through LFA6 on a low-level transit to Waddington at 125kt, below a 2500ft cloudbase. A squawk of A7000 was selected with Mode C, but they were not in communication with any ATSU.

Heading 030° at an altitude of 75ft RPS, they were following a planned route between two low-level warnings promulgated by UK (L) series NOTAMs UKLB 1854 and 2070. The Microlight site was not an obvious ground feature and the leader of the pair was also having difficulty arranging ATZ penetration at Peterborough - Conington. Neither Chinook crew saw the other ac on the ground, therefore, he was unable to quantify the separation that pertained at the time.

UKAB Note (1): The UK MIL Aeronautical Planning Document extant at the time of the Airprox at Vol. 3 Part 1 1-2-6-6 (LFA 6) promulgated a warning only of MS03, the microlight site at Brooklands Farm noting that foot-launched activities take place. No mandatory avoidance criteria were specified for this location nor are there any currently. UKLB NOTAM 1349, was transmitted on 31 Jul 02, promulgating a warning only of paramotor and microlight activity taking place between the surface and 2000ft agl at Brooklands Farm between 31 Jul – 31 Oct 02. No mandatory avoidance criteria were specified for this location.

UKAB Note (2): The UKLB NOTAMs noted promulgated warnings respectively of - 1854: Kite flying from ground level to 1500ft agl within a 2nm radius of Upton (5224.03N 00016.29W) from 1300UTC to dusk; 2070: an unmanned captive balloon operating at position (5220.34N 00011.57W from ground level to 150ft agl. No mandatory avoidance criteria were specified for either location.

UKAB Note (3): This Airprox occurred outwith the coverage of recorded radar.

THE BHPA comments that there are a number of disappointing aspects to this occurrence; that the Chinook crews were apparently unaware of UKLB NOTAM 1349 despite knowing about two others in the area, that the microlight site and kite flying UKLBs were of such a general nature as to limit their usefulness, and that the paramotor pilot should have falsely believed that the site had an avoidance status. By flying at 125kt and 75ft in the vicinity of a known aviation site the Chinook crews were not giving themselves, or any pilot about to take off, much opportunity to avoid just this sort of an incident. It is fortuitous that the paramotor pilot was in a position to safely abort his take off.

HQ JHC comments that although avoidance is not mandatory, airmanship dictates that lookout is essential at and around microlight sites, and due consideration should be given to users. The microlight site at Brooklands Farm is depicted on the UK Military Low Flying Chart (LFC) and therefore the Chinook crews should have been aware that this was an aviation site. It has not been possible to positively determine whether the Chinook crews were aware of UKLB NOTAM 1349 due to operational commitments. However, given that the paramotor pilot saw the Chinooks and aborted his take off, there appears to have been little or no risk of collision.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of the ac involved and comment from the appropriate association and operating authority.

The Board was briefed that this was the first of two occurrences that day, in the vicinity of Brooklands Farm site according to the paramotor pilot. However, the Board could only consider specific incidents reported by the pilots of ac actually involved, consequently, discussions here related only to this specific Airprox with the Chinook pair as reported by the paramotor pilot.

Both Chinook crews should have been aware of the presence of the Brooklands Farm site from their pre-flight planning and the LFC graphics. Notwithstanding any difficulties associated with routeing through the Peterborough Conington ATZ, the Chinook leader should have been aware

that he was approaching Brooklands Farm. However, this was a 'green field' site and pilot members realised when shown copies of aerial photographs provided by the paramotor pilot, that it might be difficult to see from the air at very low-level. The Board noted that activities at this site had been promulgated to military crews by UKLB NOTAM 1349, which should also have provided an adequate warning. Contrary to the paramotor pilot's understanding military regulations did not require crews to avoid the site when operating below 2000ft agl. UKLB 1349 and the UK Mil AIP entry was only a warning and mandatory avoidance of this site was not (and is not) stipulated. Nonetheless, members agreed that good airmanship dictated that it should have been given a wider berth and it seemed that neither Chinook crew had realised they were about to overfly this active site before they did so.

Fortunately the observant paramotor pilot had quickly detected the approaching Chinooks in time to abort his take-off and had, thereby, stopped dead the development of what might have been a serious incident. This prompt action was applauded by members, who noted that the two helicopters had flown through the area unaware of what he had done. Whilst critical of the Chinook leader's actions, the Board agreed unanimously that the paramotor pilot had removed any possible risk of a collision.

PART C: ASSESSMENT OF CAUSE AND RISK

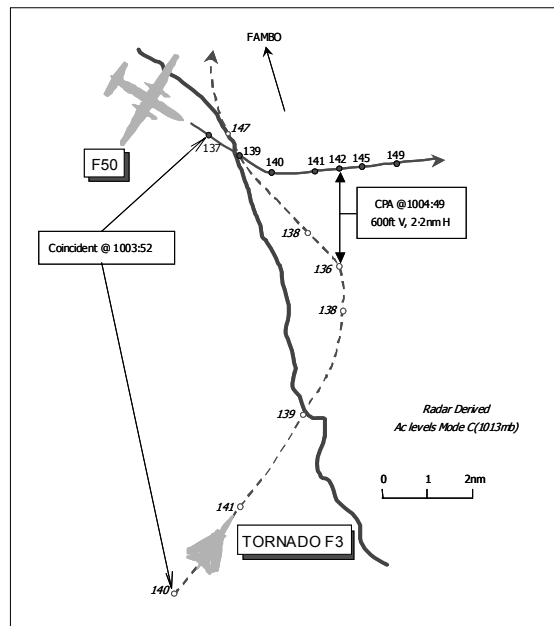
Cause: Sighting report.

Degree of Risk: C.

AIRPROX REPORT NO 157/02

Date/Time: 29 Aug 1004
Position: 5426N 00025W (8nm SSE FAMBO)
Airspace: London FIR (Class: G)
Reporting Aircraft Reported Aircraft
Type: F50 Tornado F3
Operator: CAT HQ STC
Alt/FL: FL137↑ FL140

Weather VMC NK VMC CAVOK
Visibility: 10km >20km
Reported Separation:
 100ft V, Nil H 2000ft V, 5nm H
Recorded Separation:
 600ft V, 2.2nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE F50 PILOT reports that he was en route from Teesside to Amsterdam, squawking 6314 with Mode C, and in receipt of a RAS from Pennine Radar on 128.67MHz. Climbing at 160kt and passing FL145, he thought, in the climb to FL210 a TA showed on TCAS just before ATC gave traffic

information on military traffic together with a hgd to fly. Very soon afterwards a TCAS RA "climb" enunciated requiring ROC in excess of 2000fpm; this was actioned. TCAS RA "monitor vertical speed" then enunciated, requiring the crew to virtually level off, and this was followed by a

AIRPROX REPORT No 157/02.

further RA “*climb, climb*” again in excess of 2000fpm. The other traffic was below and came within 100 to 200ft. “*Clear of conflict*” was duly received and thereafter the flight continued normally. ATC were informed and they made contact with the military controller who advised that the pilot of the military FJ had the F50 “fully visual” at all times. He assessed that the risk of collision was high.

THE TORNADO F3 PILOT reports that he was flying at M0-7 and hdg 330°, he thought, in good VMC at FL160, he thought, and in receipt of a RIS from London (Mil). His ac was camouflaged grey and nav lights were selected on, although his ac was not fitted with HISLs. London(Mil) reported conflicting traffic with which AI radar contact was established at 10nm range. Subsequently the traffic was acquired visually and he manoeuvred so as to pass behind and above it. He was visual with the traffic throughout and passed clear by 2000ft vertically and approximately 5nm horizontally. At no time was there the slightest risk of collision as assessed visually and by on-board radar.

THE TORNADO PILOT’S UNIT comments that the Tornado F3 pilot was in transit in Class G airspace prior to conducting an air defence exercise off the East Coast. The crew received a good service from London(Mil) and acquired the traffic both on radar and visually. They avoided the ac by a wide margin, assessed as 5nm and 2000ft. It appears that at no time was there any risk of collision. It is regrettable that the crew were not made aware sooner of the intention of the other pilot to file an Airprox, so that the onboard recording tapes could be examined.

THE PENNINE RADAR CONTROLLER reports that the F50, routing from Teesside to Amsterdam, was in receipt of a RAS on 128.67MHz. When the ac was 5nm W of FAMBO, climbing through FL137 for FL210, he observed a fast military jet emerging from several contacts operating approx 15nm S of the F50. The military ac was level FL140 heading NE flying at approximately 500kt. He instructed the F50 pilot to turn L hdg 090° but did not instruct him to stop climb as he believed that would have compounded the situation. The F50 pilot responded to the traffic information by reporting that he could see the conflicting traffic on TCAS. A further L turn to hdg 080° was given and an

attempt made to coordinate with LATCC(Mil) Controller 15 who was working the traffic. At this point the F50 pilot reported that he was taking an RA instruction to climb. Controller 15 advised that his ac, a Tornado, was under RIS, had the F50 in sight and was avoiding it visually. The Tornado subsequently turned to go behind the F50.

ATSI reports that at the time of the incident, the MACC Pennine SC was providing the F50 with a RAS in class G airspace, while the military traffic involved in the Airprox was ‘unknown’ to him and appeared from amongst a number of contacts. It had originally been in a R turn before steadying on a northeasterly track. MATS Pt 1, Sect 1, Chap 5, para 1.4 - Radar Advisory Service – states: “*Controllers shall pass avoiding action instructions to resolve a conflict with nonparticipating traffic and, wherever possible, shall seek to achieve separation which is not less than 5nm or 3000 feet, except when specified otherwise by the CAA. However, it is recognised that in the event of the sudden appearance of unknown traffic, and when unknown traffic make unpredictable changes in flight path, it is not always possible to achieve these minima.*”

Once the potential threat of the fast moving ‘unknown’ military traffic had been recognised by the Pennine SC he reacted quickly, instructing the F50 to turn L hdg 090°, and later 080°, from its original south-easterly track. This would reduce track convergence with the ‘unknown’ traffic and was probably the only practical option as the military traffic’s flight profile could not be predicted. This was followed by traffic information, which although not in the correct format, nevertheless appeared to have been assimilated by the pilot who responded with “*...got him on TCAS*”. With only limited time available, the SC’s next priority was to co-ordinate a plan with the LATCC(Mil) Controller 15 who, he had established from the radar TDB, was providing a service to the military flight. Approximately 23 sec elapsed from initiation of the call to when the SC was able to speak to the controller concerned. He said: “*You’re at the same level as my 6314 (SSR code) just merging now just standby...*”. The Pennine SC then had to break off his conversation to acknowledge a report from the F50 pilot that he was following a TCAS RA. (Note: the radar recording does not show the ac returns having merged at this point, but the military flight is about 3nm S of the F50 in

a L turn about to pass through N). Regrettably, with this further delay the opportunity had passed to effect any meaningful co-ordination between the 2 controllers, the military traffic ultimately passing astern of the F50. Finally, notwithstanding the limited time available to the Pennine SC to effect some avoiding action and then attempt a co-ordination with the military controller, the F50 pilot could have benefited from further updates of traffic information to assist him in assessing the threat. That said, it should be noted that only one min elapsed between initial turn instruction to the F50 and the CPA.

MIL ATC OPS reports that the Tornado F3 was under service from London(Mil) Controller 15 (CON 15) on 293.47MHz. Following departure from Coningsby and passage through CAS at FL110, using the Scunthorpe Radar Corridor (RC), the Tornado F3 pilot was placed under a RIS as he left the RC, cleared to resume his own navigation and given climb to FL190. At 1002 the Tornado pilot advised that he would be maintaining FL140 and requested an early handover to Neatishead, with which ASACS unit he would be working. However, CON 15 advised the pilot that Neatishead had requested handover in the FAMBO area. Just after 1003 the Tornado F3 pilot requested RAS. Accordingly, CON 15 upgraded service to RAS and then issued avoiding instructions against traffic, the F50, stating "...avoiding action turn R hdg 090, traffic L 2 o'clock [sic] 8 miles L R indicating FL138 climbing." . However, the Tornado pilot did not take the avoiding action but responded "*Roger (unintelligible words) information, c/s*". CON 15 acknowledged this and service was downgraded to RIS at 1004. Thereafter the Tornado F3 pilot reported "*And got visual, c/s, that traffic*". CON15 then provided amplifying information "*c/s, roger, believe civilian traffic climbing through your level going GAT at SILVA*" to which the Tornado F3 pilot responded "*Copied*". Shortly after this Pennine Radar controller contacted CON 15 for co-ordination although it is clear that this was too late to be effective since, having established landline contact, the Pennine Radar controller stated "...*you're at the same level as my 6314, just merging now just standby...*". Subsequently the Pennine Radar controller advised CON 15 that the F50 pilot would be filing an Airprox.

HQ STC comments that assisted by ATC information, the Tornado F3 crew gained radar

and then visual contact on conflicting traffic that was crossing their intended track. The crew took sensible evasive action to give the F50 a wide avoidance and passed well behind it maintaining a large vertical separation. The safe and professional avoiding action taken by the Tornado F3 crew resolved this sighting in the FIR.

UKAB Note (1): Analysis of the Claxby radar data recording shows the F50 squawking SSR Mode A code 6314 with Mode C, tracking ESE. At 1003:52 the F50, which displays 137 on Mode C, has the Tornado, squawking Mode 3/A code 6153 with Mode C showing 140, at 2:30, range 10.4nm, tracking NE. At 1004:16 the F50 displays 139 on Mode C and commencement of a L turn is first apparent. Two sweeps later, at 1004:31 by which time the F50 is steady on E, the subject ac are 4.5nm apart as the Tornado commences a L turn. CPA occurs at 1004:49 when the F50, is tracking E and displaying 142 on Mode C, and the Tornado F3 is 2.2nm to the S, tracking NW, and displaying 136 on Mode C. An increased ROC by the F50 is evident on subsequent radar sweeps, which is consistent with the F50 pilot's report of compliance with TCAS RAs. The Tornado, which then commences climb, subsequently passes 2.5nm behind and below the F50.

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 recording, reports from the air traffic controllers involved and reports from the appropriate ATC and operating authorities.

Members were agreed that this was a conflict of the type to be expected in the FIR but noted the disparate consequences of the encounter. From the perspective of the Tornado F3 cockpit, it was a routine conflict of flight paths resolved by the pilot taking, what in his opinion, was appropriate action to ensure he passed well clear of the F50. Whereas from the perspective of the F50 flight deck the situation was quite different. Having been warned of the conflicting traffic and given advisory avoiding action, the F50 crew then received no less than 3 consecutive RAs; these resulted from the length of time that the nose of the Tornado was pointing towards the F50's predicted track and the Tornado's vertical

AIRPROX REPORT No 157/02.

manoeuvring. An airline pilot member explained that TCAS works by computation of time to CPA. Within a bubble around the host ac, the majority of which is projected forward, TCAS scans for potential threats on the basis of time to CPA. TCAS provides resolution indications aurally and visually but only in the vertical sense. This is computed through comparison of relative vertical positions and vectors, those of the threat ac being derived from its Mode C transmissions. He emphasised that in this incident the situation was exacerbated by the time that the nose of Tornado F3 was pointing towards the F50's predicted track. He also suggested that an important lesson could be learned. Given that TCAS resolution is in the vertical sense only, it would have been better had the Tornado F3 pilot resolved the encounter by taking vertical, rather than lateral, visual separation. Other Board members also shared his view that military pilots might benefit from a briefing on TCAS and the implications of their actions on TCAS-equipped ac that they are likely to encounter increasingly in Class G airspace. A military pilot member suggested that encounters such as this were inevitable where CAT pilots elect to operate within Class G airspace. All members were agreed that such incidents were likely to occur in increasing numbers and therefore it was incumbent upon all operators to be aware of the consequences.

Attention was then focused upon the actions of the controllers involved. The avoiding action provided by the Pennine SC was discussed and although the F50 had been turned to the L whereas, arguably, the shorter turn was to the R, nevertheless this was accepted as a prudent move; the Tornado had emerged from a group of contacts towards which the F50 would have been vectored had a R turn been given. It was also noted that CON 15 had offered the Tornado pilot an advisory R turn although this was declined. The latter then reverted to RIS, reported visual

contact with the F50 but continued on a converging track. The Pennine SC was not advised of this until after the encounter.

Concern was voiced at the length of time that it had taken for the Pennine controller to establish landline contact with LATCC(Mil) CON 15 in an attempt to effect co-ordination. The Mil ATC Ops advisor explained that the call had been routed via the LATCC(Mil) Allocator and when redirected to CON 15 the latter was passing traffic information in respect of another ac under service. The Board also noted that although Pennine SC advised CON 15 that the F50 pilot was going to file an Airprox, this information had not been relayed to the Tornado pilot, thereby denying the Tornado pilot use of best evidence from the onboard recording tapes. [UKAB Note: Response to the initial Airprox report was received from the Tornado F3 pilot 15 days after the incident by which time his recollection of events had significantly deteriorated.] It was explained by the Mil ATC member that the non-relay of this information was iaw extant Unit policy, whereby the operating unit rather than the crew is notified, although this policy would be reviewed – an undertaking that was welcomed by Board members.

As to risk, members were agreed that there had been no risk of collision since the action taken by the Tornado F3 pilot had achieved minimum lateral separation of 2.2nm, notwithstanding the 5nm prescribed separation criterion being attempted by the Pennine Radar controller.

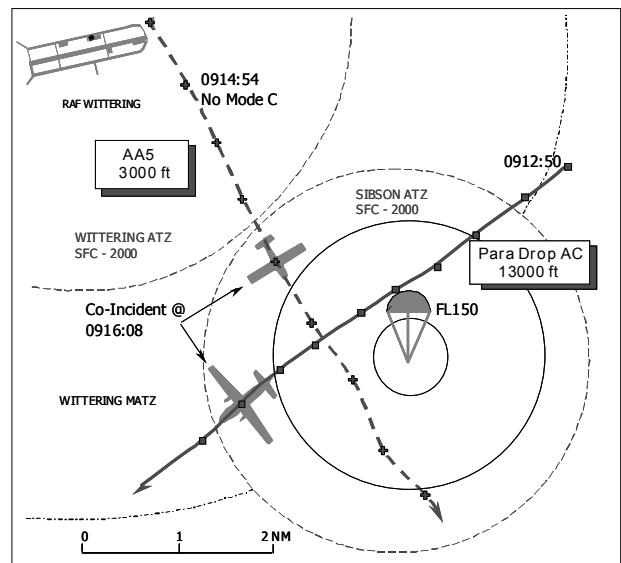
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in the FIR

Degree of Risk: C

AIRPROX REPORT NO 158/02

Date/Time: 7 Sep 0915 (Saturday)
Position: 5233 N 0023 W (Sibson Free Fall Drop Zone - elev 100ft)
Airspace: London FIR (Class: G)
Reporting Aircraft **Reported Aircraft**
Type: Parachutists Grumman AA5
Operator: Civ Pte Civ Pte
Alt/FL: 3000ft 000ft
 (NK) (QNH)
Weather VMC VMC CAVOK
Visibility: NK 10km
Reported Separation:
 100ft H 100ft V NK
Recorded Separation:
 Not Recorded

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

THE PARACHUTIST reports that he was one of a group of parachutists engaged in a free fall descent. The weather conditions were excellent with no low level cloud and the group had jumped from their drop ac at about 13000ft within the Sibson Free Fall Drop Zone. The parachutist was filming a tandem skydive which was uneventful until, at about 3000ft, an ac was seen to fly between the reporting parachutist and the jumper who had left the ac immediately before him. He deployed his parachute straight away, at which time the ac was about 300ft away laterally and below by about 100-150ft vertically. As the ac passed directly in front, the minimum horizontal distance was estimated at 100ft and the risk was described as "severe". The ac, which was described as white with yellow wing tips and heading about 160°, was not seen to make any changes to heading or altitude.

THE GRUMMAN AA5 PILOT reports cruising at 3000ft, heading 155° at 120kt whilst en route to a destination in France. His ac was coloured green and white with anti-collision beacon, strobes, transponder (with Mode C) all selected on. He states that he was receiving an "Information" service "between Waddington – Luton". He had

not seen the parachutists and believed that he had routed to the east of Sibson.

MIL ATC OPS reports that the AA5B worked Waddington ZONE between 0850 and 0905 when he was transferred en-route and advised "...Cottesmore closed". Having been allocated a Waddington Squawk of 3603 it appears as though the AA5B pilot retained this after being released from Waddington's frequency. At weekends, Waddington LARS can become very busy. Aircraft in receipt of a Radar Service (RAS/RIS) have priority therefore other ac are released en-route as soon as possible. The Unit reports that they usually receive details of Sibson activity though this is not always the case, particularly at weekends. As the AA5B pilot was not in communication with Waddington the onus must be on the pilot to ensure his route takes him clear of other air activity.

UKAB Note (1): Analysis of the Debden radar recording from 0910 shows the paradrop ac running in from NE (Mode C showing 151) with an ac squawking 3603 (No Mode C seen) approaching the area from NW, this is the AA5 at the reported 3000ft. The two ac maintain their tracks and at 0916:42, the 3603 squawk passes about 1.5nm behind the drop ac.

AIRPROX REPORT No 158/02.

UKAB Note (2): Relevant UK AIP entries are as follows:

ENR 1-1-5-7 para 5.4.1 states:

"Intensive free-fall parachuting may be conducted up to FL150 at any of the Drop Zones listed at ENR 5.5 and in several Danger Areas.

ENR 1-1-5-7 para 5.4.3 states:

"Visual sighting of free-falling bodies is virtually impossible and the presence of an aircraft within the Drop Zone may be similarly difficult to detect from the parachutists' point of view. ... Pilots are strongly advised to give a wide berth to all such Drop Zones where parachuting may be taking place."

ENR 5-5-3-2 promulgates the Peterborough/Sibson Free-Fall Drop Zone as:

"Circle 1.5nm radius of 523335N 0002346W. Vertical Limits FL150. Remarks: Activity notified on the day to Cottesmore ATC or London TCC outside hours of Cottesmore. Hours: Normally during daylight hours."

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilot and parachutist, radar video recordings, reports from the air traffic controllers involved and reports from the appropriate ATC and operating authorities.

The GA specialist was of the opinion that pilots needed more education about Para Drop Zones. In good conditions, freefall drops could commence from altitudes up to 18,000ft, and the jumpers may be some distance from the target area at that stage. Consequently, it was very difficult to remove the Airprox risk associated with this activity. Some years ago, a system was put in place whereby a "Parent Unit" was informed of

para drop activity, but this system has proved to be of limited use. This incident supports this situation, although it was acknowledged that Cottesmore was closed and the pilot had left Waddington frequency some time before the Airprox. It would be more useful if pilots were able and encouraged to call the drop site direct, on published frequencies.

In this case, there was a suggestion that the Grumman pilot was uncertain of his position, as he stated that he thought he had flown east of Sibson. This was felt unlikely by the majority of members, who observed that he had only just overflowed the easterly end of Wittering's runway and the A1 road, which bends to run east of Sibson, would have been clearly visible in the reported conditions.

Some members suggested that Para Drop Zones should receive extra protection, such as a requirement for ac to call on RT before entry. Others pointed out that such a large area would then have to be designated, due to jump heights and wind variations, as to render it impractical.

The Board concluded that the AA5 pilot, who had flown through the Sibson Para Drop Zone against published advice, could and should have been able to avoid the site and thus significantly reduce any risk to himself or others. Once inside the zone and underneath the descending free-fall parachutists, the strong advice articulated in the ENR came into play. It was unsurprising thereafter that the separations involved with the number of jumpers in a small area had resulted in an actual risk of collision.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The AA5 pilot flew into conflict with a parachutist, which he did not see, in the Sibson Para Drop Zone.

Degree of Risk: A

AIRPROX REPORT NO 159/02

Date/Time: 10 Sep 0839

Position: 5249N 0316W (5½nm SW of MONTY)

Airspace: AWY A25 (Class: A)

Reporting Aircraft Reported Aircraft

Type: Jetstream 41 Tornado GR4

Operator: CAT HQ STC

Alt/FL: FL180 FL180↓

Weather VMC NR VMC SKC

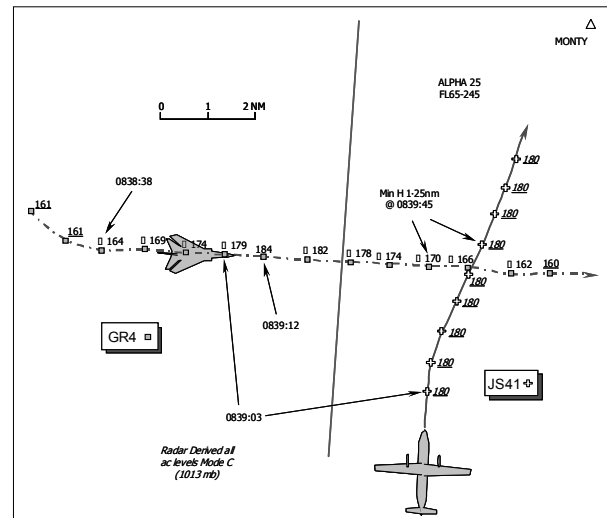
Visibility: 30km >10km

Reported Separation:

½nm H, 1-200ft V 2½nm H

Recorded Separation:

1.25nm H

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

THE JETSTREAM 41 PILOT reports that he was flying northbound on A25 under an ATC service from MACC, in level cruise at FL180. A squawk of A5014 was selected with Mode C and TCAS is fitted. The 1st Officer was flying the ac from the RHD seat, with autopilot 'in'. Approaching MONTY, heading 355° at 205kt, MACC instructed them to turn 35° R for avoiding action. A military jet was observed passing about ½nm astern and 1–200ft below his ac with a "high" risk of collision. No TCAS advisories were enunciated.

THE TORNADO GR4 PILOT reports his ac has a grey camouflage scheme, but HISLs were on whilst in transit from W Wales for a recovery to his base at Marham on minimum (chicken) fuel at 300 kt. [UKAB Note (1): Chicken fuel is sufficient fuel for recovery and also for flight to the nominated diversion aerodrome]. The sky was clear with no cloud with an in-flight visibility of >10km. Upon pulling up he free-called London MILITARY on 234.275MHz and requested a climb and direct track for Marham to rtb. London MILITARY released them own navigation direct Marham, initially under a RIS, and asked what FL was required for the transit. FL200 was requested and a turn onto 090° initiated; the controller replied "roger" and a climb to the requested level of FL200 was commenced. The Environmental Control System – Temperature (ECST) caption warning illuminated during the climb highlighting

an avionics bay 'overtemperature', which necessitated reference to his FRCs; these drills were ongoing throughout the incident. Whilst passing FL180 London MILITARY ordered an avoiding action descent to FL160. Traffic Information was also passed on the conflicting traffic and he replied that he was visual – London MILITARY had changed the ATS to RCS shortly after the climb was established. He assessed the risk of collision as "low".

THE MACC WEST/IOM SECTOR RADAR CONTROLLER reports that the JS41 was northbound on the W side of A25, heading 010° maintaining FL180. His CO-ORDINATOR cleared the GR4 to cross A25 eastbound between MONTY and the NITON RC level at FL160. He ticked the crossing FPS to show that he had seen the strip – in accordance with standard procedure - but moments later observed the GR4 climbing through FL160 as it approached CAS rapidly. The CO-ORDINATOR also saw this and attempted to contact the LJAO controller, whilst he gave the JS41 crew an avoiding action R turn onto a heading of 030° and passed traffic information. No climb or descent instructions were issued as he did not know the intentions of the GR4, but the heading ensured the blips did not merge. The JS41 pilot reported visual contact with the jet which descended and passed 300 ft below the Jetstream and 2.3nm astern.

AIRPROX REPORT No 159/02.

MACC reports that the Jetstream was northbound on A25 on a heading to the western side of the airway in accordance with traffic orientation scheme at FL180. London MILITARY then called the W/IOM CO-ORDINATOR to arrange a crossing clearance of A25 between MONTY and the NITON RC for the Tornado GR4 W of the airway.

FL160 was issued by the CO-ORDINATOR and this was read back correctly by the Military controller. The CO-ORDINATOR placed the strip in the FPS display and the RADAR controller acknowledged the crossing clearance by ticking the strip. RADAR then observed the GR4 climbing through FL160 as it approached the airway rapidly from the west. Aware that the two ac were on conflicting tracks and that if vertical separation was eroded then standard horizontal separation would not be preserved, RADAR immediately issued avoiding action to the JS41 crew, instructing them to turn R 30°, followed by traffic information. Meanwhile, the CO-ORDINATOR, attempted to contact the London MILITARY controller.

The JS41 crew reported visual with the GR4, but RADAR remained highly concerned because he was not aware of the jet pilot's intentions and further avoiding action was impossible. The GR4 subsequently passed behind the Jetstream descending to its assigned level - FL160. The Jetstream pilot reported on the frequency that he would be filing an Airprox report.

ATSI endorsed the MACC report.

MIL ATC OPS reports that, as both LJAO NW and CENTRAL Sectors (situated at Swanwick Mil) were quiet, they had been banded together. At 0835, the Tornado GR4 crew freecalled on the LJAO CENTRAL frequency – 254.275MHz, "..... pulling out of low level ten miles north east of Llanbedr looking to RTB Marham via the Lichfield". A squawk of A6447 was assigned, the ac identified and the crew asked ".....what type of service"? At this point the CENTRAL control position was handed over to another controller. The Tornado crew had freecalled the wrong ATCRU - they should have called London RADAR (LRAD) at LATCC (Mil) on their ICF - and it was CENTRAL's intention to identify the ac and hand it over to LRAD for transit through the Lichfield Radar Corridor (RC). However, when the crew

confirmed they required a RIS, they also added "*...is there any possibility that we can go higher than one six zero*" – the level of the Lichfield RC. Although still in LRAD's RSA this request would eventually put the Tornado within LJAO's area of responsibility, through the main spine of CAS within the ALPHAs, therefore, the controller believed that CENTRAL was the most appropriate ATSU to provide a service through the airway. Consequently, CENTRAL continued to work the flight and responded "[C/S] *for the moment flight level 160 and I'll see if I can get you higher across*", to which the crew responded "*many thanks [C/S]*". Just before 0837, LJAO CENTRAL passed traffic information on GAT within A25 – the JS41, "*...south easterly twenty miles FL180*" and instructed the GR4 crew to turn R onto 160° to remain clear of that traffic, advising the crew "*...I'm going to co-ordinate*". LJAO reports that co-ordination was achieved with MACC W, via the MACC IOM direct access landline, to climb the GR4 to FL160 beneath the JS41, which was maintaining FL 180. Just after 0838, the GR4 crew was given own navigation to Marham and asked "*.....what level would you require*", the Tornado responded "*in which case we'd like FL200*". This was acknowledged by CENTRAL, "[C/S] *Roger*", and shortly thereafter the flight was placed under a RCS for crossing A25. At about 0839, having been alerted to the conflict by MACC W via landline, CENTRAL transmitted "[C/S] *avoiding action descend FL160*", followed soon after by traffic information "*...right one o'clock 3 miles crossing right to left at FL180*". CENTRAL very quickly advised the GR4 crew "*I did not clear you to climb to maintain FL160*" to which the crew responded, "[C/S] *visual with that traffic*" - adding shortly afterwards "*... level FL160*". Further avoiding action was passed on unrelated traffic just after 0840, the turn was taken however the crew advised "*We're not quite [fuel] priority but we're looking for a level to take us as close to RTB on a direct track if possible*". At 0843 the crew was released "*.....direct track Marham now*" followed once again by the crew requesting a higher level. CENTRAL responded "*...I'm trying to get you a higher level now...*" after which a climb to FL200 was approved. The flight subsequently recovered to Marham without further incident.

The oncoming LJAO controller states in her report that she was happy to assume responsibility of the banded control position. After obtaining co-

ordination and thereby, in her eyes, making the GR4 safe, CENTRAL turned her attention to the problem of crossing the CAS 'spine' in the vicinity of SAPCO. The RAF FLIP En-Route Supplement - British Isles & North Atlantic (BINA) - clearly states that "*Service in the Lichfield Radar Corridor is provided by London RADAR*", situated at LATCC (Mil). Had the Tornado crew called the correct ATCRU then this distraction would not have occurred and the controller may have spotted the Tornado's unauthorised climb. Despite the ac indicating FL184, ever mindful of the agreed co-ordination, the avoiding action descent was an understandable reaction by CENTRAL. With the benefit of a more leisurely analysis of events, an avoiding action climb might have increased separation sooner. Once again with hindsight, after determining the Tornado's desired transit level, a reiteration to maintain FL 160 would have avoided any ambiguity. JSP 318A 905.125.1, however, records "roger" as meaning, "*I have received all your last transmission*", and therefore, it should not have been construed as a clearance to climb by the Tornado crew. The pitfalls of not 'spelling out' instructions will be highlighted, nevertheless, the onus should be on the pilot to wait for a positive instruction, or at least obtain clarification if unsure.

UKAB Note (2): Analysis of the LATCC (Mil) Cleve Hill radar recording shows the Jetstream northbound maintaining FL180 throughout - 2nm inside the western boundary of A25. The Tornado is shown eastbound, climbing through FL164 at 0838:38, in conflict with the JS41. At 0839:12, the jet had climbed through the level of the Jetstream and ascended to FL184, just under 1 $\frac{3}{4}$ nm outwith the boundary of CAS. At 0839:20, the JS41 is shown turning R, following the avoiding action turn issued by the MACC W SC and the Tornado is 3 $\frac{1}{4}$ nm WNW descending through FL182 Mode C. Minimum horizontal separation of 1.25nm is shown at 0839:45, as the jet descends through FL170, 1000ft below the JS41. The Tornado eventually passes directly astern of and 1600ft beneath the JS41, before levelling at the assigned level of FL160 some 17sec later.

THE TORNADO GR4 PILOT'S UNIT comments that this was an unfortunate incident where the pilot, possibly distracted by the ac malfunction, climbed without positive clearance. Fortunately the weather conditions were very good and the pilot saw the other ac in good time. The HUD

video recorded the whole incident and shows the other ac passing through the 12 o'clock position with good separation. [UKAB Note (3): The radar recording indicates at a range of 1 $\frac{3}{4}$ nm at this point.] Several lessons are evident from this Airprox:

If you are running a chicken profile, allow a little extra fuel if you need to cross CAS.

If a likely confliction could arise the controller may wish to add "maintain level" after receiving a climb request from a pilot.

HQ STC comments that there were several reasons why this Airprox occurred. Firstly, the crew were obviously distracted by both their fuel state and also their ECST caption; a minor avionics cooling failure and certainly not flight safety critical. Couple this distraction with a request to climb and a "Roger" response and they incorrectly assumed this was clearance to climb to FL200. It is believed that the incorrect frequency selection came from a confused glance at the 'Upper Airspace Service Areas' on page 208 of the then current RAF FLIP ERS-BINA, when they should have looked at the previous page, which details MAS radar services. All this is indicative of a flustered crew with lots of minor problems to deal with. Fortunately, they were not IMC, saw the Jetstream and maintained adequate separation. However, there is no excuse for the crew who exceeded their cleared level.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available to the UKAB 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 Mil ATC Ops advisor emphasised that the GR4 crew had called the wrong ATSU for crossing airway ALPHA25; they should have called LRAD at LATCC (Mil). The STC pilot member explained that the GR4 crew was relatively inexperienced, but there was little mitigation for their error. Though this could have impacted adversely on the efficiency of LJAO CENTRAL, the crew had called with the best of intentions and with little other

AIRPROX REPORT No 159/02.

traffic to concern her here, the LJAO CENTRAL controller at Swanwick had elected to retain the Tornado under her control and effect the crossing of A25 herself. Clearly CENTRAL had spotted the northbound JS41 and had turned the jet to pass astern and climb below it initially – in case co-ordination was not forthcoming – then efficiently arranged a cleared flight path (CFP) through the airway with MACC at FL160, before allowing the GR4 crew to turn back towards base and, coincidentally, the JS41. Moreover, the LJAO controller had highlighted the presence of the JS41 by passing accurate traffic information on the airliner to the Tornado crew but it was possible that they had not absorbed this information and the potential for conflict with the JS41, which might be explained by the relatively minor distraction of the ESCT caption. However, the military pilot members felt it was more likely to be the crew's apparent pre-occupation with their limited fuel reserves, hence their concern at obtaining a more direct track/higher level for return to Marham. That this factor probably loomed large in the mind of the GR4 crew was recognised by the Board, but it was not an emergency situation and the STC member stressed that it should not be viewed as such. Furthermore, he opined that it was disappointing that this Airprox had occurred so soon after sage advice had been circulated to flying units within his Command on this topic. Another recent Airprox (102/02) had prompted a reminder to aircrew not to allow fuel states to be eroded unnecessarily when engaged in tactical exercises and to ensure that ample reserve was in hand for the subsequent recovery.

Members agreed that the GR4 crew had evidently misunderstood the LJAO CENTRAL controller's answer of "[C/S] Roger" to their request "...we'd like FL200", to be a permission to climb above their co-ordinated level of FL160. The Board could only surmise that the crew had acted on what they wanted to hear rather than what had been said. This was an excellent example to military crews on how a seemingly benign situation can go awry very quickly. Members postulated that if CENTRAL had reinforced the assigned level here with words such as "maintain FL60 for the moment" this would have averted the Airprox, but there was no real need to do so and the controller had done all that she had thought

necessary at the time. Therefore, it was unfortunate that CENTRAL had not detected the GR4's climb above the flight's assigned level from her radar display earlier than she did; the jet was clearly shown on the radar recording climbing through FL164 - above the assigned level - over one min before the Airprox occurred. As it was, the alert MACC SC10 spotted the GR4 crew's error and, through his COORDINATOR, alerted CENTRAL. This was accomplished very quickly as SC10 passed avoiding action to the JS41 crew. It was explained that CENTRAL would have been busy arranging a cleared flight path through the 'ALPHAs', which entailed concentrated effort 'heads down' on the electronic keyboard – itself a distraction but again a salutary lesson to the unwary. It was unclear if CENTRAL's STCA had been triggered, which SC10 reports had been activated at MACC. However, once alerted to the situation CENTRAL acted quickly and passed both avoiding action and traffic information. From all of this the Board concluded unanimously that the cause of the Airprox was that the Tornado GR4 crew climbed above their assigned and co-ordinated level.

Meanwhile, the avoiding action passed to the JS41 crew was the first indication to them of anything untoward and there was little more they could do. The swift reaction of the GR4 crew to CENTRAL's avoiding action descent instruction resulted in their climb being arrested at FL184 – some 400ft above the JS41, before descending the jet back toward its assigned level and before it had crossed the western boundary of ALPHA25 into CAS. Though some agreed with the STC comment and postulated that it would have been better to have kept the jet climbing, CENTRAL's action had the desired effect and 1000ft separation below the JS41 was afforded by the point of minimum horizontal separation – 1.25nm. Though the JS41 crew had little warning of the impending conflict, the lack of a TCAS RA at this point was probably a result of this descent and that the vector was always taking the jet clear astern of the airliner, but it was surprising that a TA had not been generated. Given that the GR4 crew were visual with the JS41 as they passed 1600ft below and astern of it, the Board agreed unanimously that no risk of a collision had existed in the circumstances reported here.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Tornado GR4 crew climbed above their assigned and co-ordinated level.

Degree of Risk: C.

AIRPROX REPORT NO 160/02

Date/Time: 19 Aug 1412

Position: 5333N N 0051 W (Sandtoft Airfield (Elev 11ft) - 7nm SW Scunthorpe)

Airspace: ATZ (Class: G)

Reporting Aircraft Reported Aircraft

Type: Robinson R22 Robin DR400

Operator: Civ Trg Civ Pte

Alt/FL: 150ft agl 100-150ft agl

Weather VMC CLBC VMC CAVOK

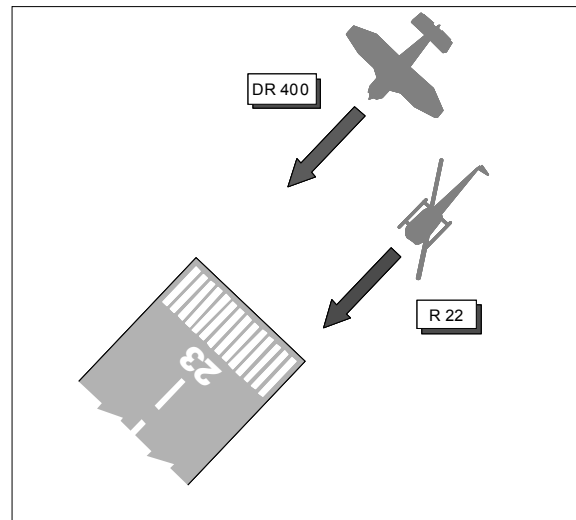
Visibility: 10km

Reported Separation:

15-20ft H, 0 V 35yd H, NR V

Recorded Separation:

Not Recorded



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE ROBINSON R22 PILOT reports that he was engaged in a circuit training detail at Sandtoft with a student pilot who was approaching the first solo stage. His ac was red and white with red strobe and navigation lights selected on; he was squawking 7000 but neither Mode C nor TCAS were fitted. At the time of the Airprox he had been in the circuit for about an hour and for most of that time had been the only ac in the circuit. Whilst downwind for RW23, he heard another ac call with the intention of joining the circuit to land and he later noted this ac joining downwind. The helicopter continued to finals, with the student making a “finals” call. On short finals, at about 200m from the threshold flying at 45kt, he heard the other ac call short finals and both he and the A/G Station operator tried to reply, which caused some confusion. Seconds later, the other ac was seen to pass down his starboard side at an estimated 15-20ft away and at the same height, before “cutting in” and continuing to a landing. He spoke to the other pilot after landing who explained that he had not heard the R22 pilot’s

‘finals’ call, though the reporting pilot checked with the A/G radio operator who confirmed that the call had been made.

THE ROBIN DR400 PILOT reports that he had diverted to Sandtoft whilst en route to Gamston because of squalls, but that the weather at Sandtoft was fine. His ac was coloured red/white, with strobes and landing light selected on. A transponder was fitted but squawk was not reported, and Mode C was switched off. TCAS was not fitted. He states that he had the R22 in sight “the whole time” and had responded to this effect when the A/G station queried whether he was visual with it. He did not hear the R22 call ‘finals’ reporting it to be in his 11 o’clock when he had rolled out on finals “as though he had done a wide base leg”. He described their relative flight paths as “converging onto 23 threshold”. He then passed the R22 at a speed of 75kt with an estimated 35yd horizontal separation. Whilst not assessing risk directly, the pilot states that he had the R22 in sight and “flew slightly right to give

AIRPROX REPORT No 160/02.

clearance". The pilot observes that at his home base helicopters fly different circuit profiles to fixed wing to remove the chance of a similar Airprox.

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

UKAB Note (2): The Rules of the Air Regulations 1996, Rule 17 "Rules for Avoiding Aerial Collisions" states:

Rule 17 (6) (a) "*An aircraft while landing or on final approach to land shall have the right-of-way over other aircraft in flight or on the ground or water*".

Rule 17 (6) (b) (i) "*...in the case of two or more flying machines, gliders or airships approaching any place for the purpose of landing, the aircraft at the lower altitude shall have the right of way, but it shall not cut in front of another aircraft which is on final approach to land or overtake that aircraft*".

Rule 17 (1) (d) "*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 of it.*"

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available to the UKAB included reports from the pilots of both ac.

The Board noted that the Robin DR400 pilot had cited that at his home base helicopters flew different profiles to the Cct pattern he encountered at Sandtoft. A civilian pilot member observed that at many civilian aerodromes, where mixed rotary wing and fixed wing flying takes place simultaneously, helicopters do not make approaches to the RW and very often land left or right on the grass adjacent to the threshold before air taxiing to the parking area. However, it appeared that whilst diverting to Sandtoft the Robin DR400 pilot might have been surprised by the R22 helicopter actually approaching the runway – perhaps not a routine situation for him. Nevertheless, whether this was unfamiliar to him or not, members were aghast at this apparent disregard for the 'Rules of the Air' by overtaking the helicopter on finals. There appeared to be no

reason to doubt the veracity of the helicopter pilot's report that he had actually made the finals call at the appropriate moment, which should have been a clear indication to the Robin DR400 pilot of his intentions. However, for whatever reason, the Robin DR400 pilot had apparently missed it. Members recognised however, that although the Robin DR400 pilot had not heard the R22 helicopter student pilot's 'finals' call, he should have realised what he was doing from previous RT calls if he had been listening out carefully – as good aviation practice dictates. Moreover, he said that he had the helicopter in sight "the whole time", and was, therefore, able to assess that he was catching up the slower R22 on a converging flightpath. Whereas, the overtaking Robin would probably have been obscured to the helicopter instructor and his student on their approach, until it came into their view forward of the R22's beam. Members could see no reason why the Robin DR400 pilot should overtake the R22 in the way he did. Though the horizontal separation could not be confirmed without recorded radar data and the reported horizontal separation according to both pilots varied between 5 & 35 yd – a significant difference - even 35yd was too close. Furthermore, these events took place at less than 200m from the RW23 threshold - according to the helicopter pilot's report. This was clearly at odds with good airmanship and Cct discipline and if the Robin pilot had been in any doubt he could have asked on RT or gone 'around'. Whilst required to give way to the R22 under the Rules of the Air, the Robin DR400 pilot showed scant regard for the helicopter pilot and his student. In the Board's opinion, this Airprox had been caused by the Robin DR400 pilot, who flew dangerously close to the R22 whilst overtaking the helicopter on short finals in contravention of Rule 17 of the Rules of the Air. This was a reckless action and the Board concluded that the safety of the subject ac had been compromised in the circumstances reported here.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Robin DR400 pilot flew dangerously close to the R22 whilst overtaking the helicopter on short finals, in contravention of Rule 17 of the Rules of the Air.

Degree of Risk: B.

AIRPROX REPORT NO 161/02

Date/Time: 4 Sep 1123

Position: 5201N 0001 W (1nm S of Royston)

Airspace: London FIR/ (Class: G)
UKDLFS

Reporting Aircraft Reported Aircraft

Type: B206B JetRanger Tornado GR4

Operator: Civ Comm HQ STC

Alt/FL: 700ft alt 750ft

(QNH 1011mb) agl

Weather VMC VMC CAVOK

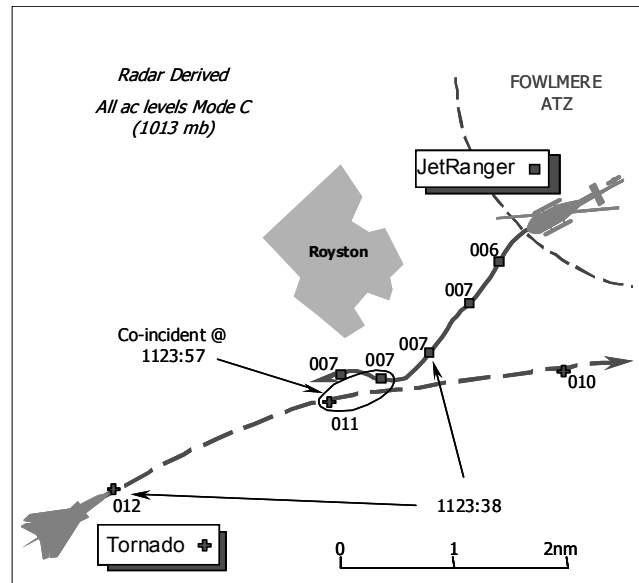
Visibility: 8km 10km

Reported Separation:

<200ft H, 50ft V Not seen

Recorded Separation:

400yd H, 350-400ft V

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

THE BELL 206B JETRANGER PILOT reports that he was conducting a pipeline inspection at 110kt and flying on a heading of 240° following the pipeline route to Whitwell, Luton. His helicopter has a silver livery and was displaying anti-collision beacons and an upper white HISSL. The SSR transponder was selected to the pipeline inspection squawk of A0036 with Mode C, but TCAS is not fitted. Clearing the Duxford area at 700ft QNH (1011mb) he changed frequency from Duxford INFORMATION (who had been providing a FIS on 122.075MHz) to Luton APPROACH, but when he looked up he saw a Tornado in the 10:30 position - 3-400ft away on a collision course. The jet was slightly above his helicopter and either in straight and level flight, or, possibly in a slow descent heading towards Duxford. He immediately rolled 60° R and descended to avoid the Tornado, which passed less than 200ft away 'port to port' and 50ft above his JetRanger. He switched back to Duxford INFORMATION on 122.075MHz and reported the Airprox. The Tornado crew was not heard to make any transmissions on either the Duxford or Luton frequencies that he had been using. He believed the Tornado crew had neither seen his ac, nor taken any avoiding action and assessed the risk as "imminent" if no avoiding action had been taken by himself.

THE TORNADO GR4 PILOT reports that he was flying a low-level sortie eastbound through LFA6. The low-level squawk of A7001 was selected with Mode C, but neither TCAS nor any other form of CWS is fitted. He had transited the vicinity of Duxford at 750ft agl at 420kt, whilst receiving a FIS from Duxford INFORMATION on 122.075MHz. Although Duxford had informed him of helicopter traffic departing the Duxford area, both he and his navigator had looked out for the PINS helicopter but they did not see the reported traffic. He was unaware that an Airprox had occurred. His Tornado bore standard military markings and HISSLs were on.

[UKAB Note (1): Analysis of the RT recording of Duxford INFORMATION reveals that the JetRanger pilot called at about 1116 for ATZ penetration, with the intention of picking up the pipeline to the S of Duxford before clearing the area to the W. At 1120 the pilot reported changing to Luton. At about 1121, the Tornado pilot called, reporting that he was a single Tornado, intending to pass about 4nm S of Duxford in about 1½ min, at low level. The Duxford FISO advised that helicopter traffic had just left the frequency, operating not above 500ft, to the SW of the field. The Tornado pilot replied "that's copied, we'll climb to five hundred". At about 1123, the Tornado

AIRPROX REPORT No 161/02.

pilot asked “got the position of the PINS helicopter yet” and was told that the helicopter was “...off my frequency, talking to Luton but was following a pipeline to the south west at 500ft”. At 1126 the JetRanger pilot called again on frequency to report the Airprox with the Tornado, just outside of Duxford’s airspace. He was told that the Tornado had called Duxford and had been warned of the helicopter’s routing to the south west. The JetRanger pilot advised the time of the Airprox and stated that it was “within 200ft separation” before leaving the frequency.]

[UKAB Note (2): Analysis of the Debden radar recording shows the JetRanger clearing to the SW of the Fowlmere ATZ boundary at 1122:50, indicating 600ft Mode C (1013mb) as the Tornado GR4 is shown transiting southbound, indicating between 4-500ft Mode C after the crew called Duxford INFORMATION. The Jet passed 9nm W abeam Fowlmere and at 1123:02, climbed to 1100ft Mode C - about 1040ft QNH (1011mb) - and turned eastbound. Approaching the vicinity of the Airprox location, the Tornado indicates 1200ft Mode C (1013mb) at 1123:38, as the JetRanger ascends to 700ft Mode C. The CPA occurs in between radar sweeps just after 1123:57, when the GR4 is shown at 1100ft and passing ‘port to port’ and above the JetRanger indicating 700ft Mode C, which itself is shown to have turned sharply R onto W as reported. By interpolation between the radar returns, the horizontal separation is estimated to be no more than 400yd as the GR4 passed 3-400ft above the helicopter, which maintained 700ft Mode C throughout.]

HQ STC comments that this Airprox appears to be the result of a non-sighting of the JetRanger by the crew of the Tornado GR4, which itself was spotted late by the JetRanger pilot. The helicopter was slightly below the GR4 and would have been difficult to detect against the background terrain, nevertheless, aircrews must work hard at maintaining an effective lookout scan at all times.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

From the analysis of the RT and radar recordings it was evident that the Tornado GR4 crew had called Duxford in good time and were given pertinent information about the PINS helicopter by the Duxford FISO. However, “operating not above 500ft, to the SW of the field” did not include all the information required – was it an altitude or height for example? Most thought an altitude as these helicopters do not normally carry radio-altimeters and that is what the B206 pilot reported. It was just unfortunate that the helicopter pilot appeared to have climbed above this bracket and had switched frequencies to Luton when he did, otherwise he also would have been aware of the jet approaching his route. Furthermore, members noted that the RT recording showed that the GR4 pilot had replied “...we’ll climb to five hundred”, in an attempt to effect vertical separation on the reported PINS helicopter but which did not afford any theoretical ‘buffer’ at all above an ac operating “not above 500ft”. However, the radar showed that the Tornado pilot had indeed made a conscious effort to achieve some vertical separation on the notified PINS helicopter, as 1100ft Mode C (1013mb) shown on the radar recording equates to about 1040ft amsl QNH (1011mb) – some 500ft above the reported maximum altitude of the helicopter. Nevertheless, it looked like the GR4 pilot was probably in the process of easing back down to his planned transit msd when the Airprox occurred (the radar recording showed the jet in a very shallow descent). In this descending attitude, the ac’s nose would not necessarily have obscured the small JetRanger helicopter, but the aspect had been virtually head-on with little crossing motion to draw attention to it until the last moment. The Board noted HQ STC’s comments on the difficulties of visual detection in the ‘see & avoid’ environment of the Class G low-flying system/FIR. However, it was evident from the GR4 pilot’s report that the B206’s silver livery and HISL against the background terrain had not been distinctive enough to reveal the helicopter’s presence to the jet crew, despite them searching the sky ahead for it. The lesson here was that no single colour provided a panacea to ac conspicuity, because so much depends on background colour and thus maximum contrast. Whereas the Tornado crew had not seen the helicopter at all, the JetRanger pilot had seen the camouflaged jet – he reported 3-400ft away which was well under ½ sec at a 530kt closing speed – but had managed to turn away as the GR4 passed

<200 ft away down the port side he said. Pilots suggested the sighting range must have been greater in order to effect any turn in time – research had shown that 2 secs were needed to react. The Board concluded therefore that this Airprox had resulted from a non-sighting by the GR4 crew and a late sighting by the B206 JetRanger pilot.

The discussion then turned to methods other than 'see & avoid' to help initial acquisition, where some members thought TCAS or another form of CWS was warranted. The value of TCAS as a catch-all safety net had been proven beyond all doubt in the regulated environment of CAS and its carriage had been mandated for CAT ac for some time. Pipeline and powerline inspection helicopter operators could complete their contracted tasks in the Open FIR, only by flying below normally accepted height separation criteria for civilian helicopters. Therefore, an exemption was required from the '500ft rule' (Rule 5(i)(e) of the Rules of the Air Regulations 1996) and to qualify, from 1 April 2003 PINS helicopters must be fitted with a CWS (SKYWATCH is the most commonly encountered), as stipulated by the CAA. The Board endorsed this positive move towards better safety. A pilot member opined that jets operating at high speeds where collision avoidance is based solely on lookout by the crew was no longer good enough. In light of this, a commercial helicopter pilot member wondered why such equipment had not been similarly fitted to military fast-jet ac operating in the low-level system. Whilst there was agreement on the efficacy of TCAS equipment in CAS, the open FIR was an entirely different environment where military fast-jet operations were vastly different to that of CAT ac operators. What was needed was equipment that could cope reliably and safely with the wide ranging roles performed by military jets – including

formation flying – yet give a timely and accurate 'heads-up' to the crew about other traffic, without generating false alerts. Civil helicopter pilots complained that this had been propounded for some time without any apparent advances being made in the fast-jet sphere, while military pilot members explained that such equipment was still not yet available from industry. However, funds had been set aside to procure the devised equipment for the Tornado GR4, once it was proven suitable for the task. At the Chairman's request, the DASC advisor agreed to brief the Board at the next meeting on progress in this field.

Returning to the specifics of this conflict, the radar recording had shown the JetRanger pilot's avoiding action R turn away from the GR4, but members questioned the 3-400ft reported sighting range for reasons explained earlier. This was supported by the separation evinced by the radar recording that showed the helicopter pilot's avoiding action had more of an effect than he might have thought; the jet had passed about 400yd away from the B206, and some 3-400ft above the helicopter. In the Board's view this had been enough to remove the risk of colliding, but – since the jet pilot remained unsighted on the helicopter, there was broad consensus – though not unanimous – that the safety of the subject ac had been compromised.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Non-sighting by the Tornado GR4 crew and a late sighting by the B206 JetRanger pilot.

Degree of Risk: B.

AIRPROX REPORT No 162/02.

AIRPROX REPORT NO 162/02

Date/Time: 11 Sep 0928

Position: 5145N 00409W (9nm NNW of Swansea Airport)

Airspace: London FIR/ (Class: G)
UKDLFS LFA7

Reporting Aircraft Reported Aircraft

Type: Do228 C130 x3

Operator: CAT Foreign Mil

Alt/FL: 3000ft↓ 2000ft↑
(QNH1027mb) (Rad Alt)

Weather VMC CAVOK VMC CLBC

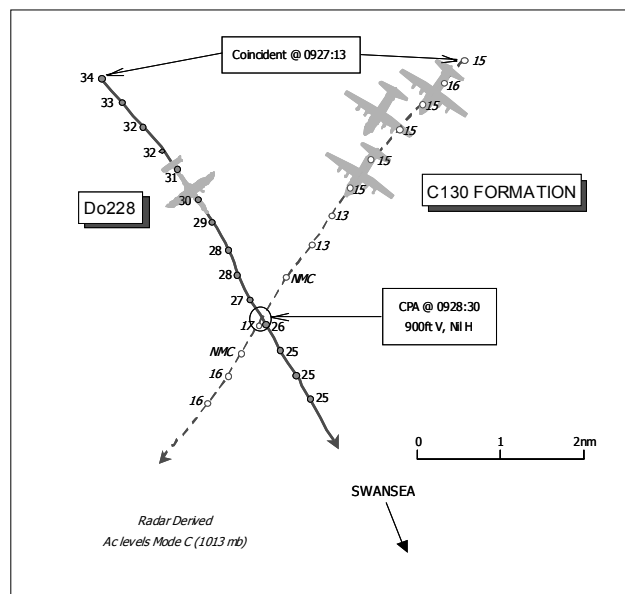
Visibility: 10 km Unrestricted

Reported Separation:

800 ft V, Nil H 1000ft V, Nil H

Recorded Separation:

900ft V, Nil H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE Do228 PILOT reports that he was inbound to Swansea from Dublin and in contact with Swansea Approach on 119.7MHz. His ac was white with a red/green stripe and the red anti-collision beacon and nav lights were selected on. His ac was not fitted with TCAS or any other form of CWS. Whilst flying in good VMC, though into sun, hdg 150° at 170kt and level, he thought, at 3000ft (Swansea QNH 1027mb), a formation of 3 khaki-camouflaged C130s was seen to pass from L to R, straight and level, 800ft underneath his ac. The first and third ac of the formation passed directly beneath, whilst the second passed approximately 400m astern. At the time of the incident the approach checklist was being actioned. He assessed that the risk of collision was medium and that continuation of his own flight path was best avoiding option. Having under flown his ac, the C130 formation continued to the SW.

THE C130 FORMATION LEADER reports that he was leading a 3-ship day visual formation at 500ft agl. The formation was hdg 200° and approaching a LFS directional flow arrow in the opposite direction, so the formation was required to climb out of the LFS structure for a few miles. The climb had just been initiated at 210kt when one of his wingmen, No 2 he thought, called traffic

at 1 to 2 o'clock. Two fighters manoeuvring at low altitude were seen at approximately 10 miles. The climb continued and, about the same time, one of his wingmen and a crew member onboard his own ac simultaneously called further traffic that was above and on a converging course. The climb was stopped at about 1500ft agl to avoid this traffic, which passed about 1000ft above. No TCAS advisories were received. Furthermore, no evasive actions by the ac were observed nor had to be taken by his formation other than to stop the climb. Consequently, he assessed that the risk of collision was low.

He also adds that the ac in his formation were camouflaged grey and that HISLs were selected on. Moreover, at the time of the incident the formation was not in receipt of an ATS.

CO-PILOT OF THE C130 FORMATION NO 2 reports that the formation, which was operating in VMC under VFR, was climbing to 2000ft agl (2400ft amsl). When passing 1500 to 1700ft agl the formation levelled off when a small, white twin-engine ac was seen at 2 o'clock on a converging course. His own ac was well clear of the traffic and all crews in the formation reported that they were visual with it.

UKAB Note (1): LFA7, Deconfliction Measures, states *"The Swansea ATZ/D118 Gap. The Swansea ATZ/D118 Gap is to be flown in a northerly direction. ..."*

SWANSEA APPROACH CONTROLLER reports that the Do228, which was in receipt of a procedural approach control service on 119.7MHz, was inbound to Swansea and in descent to 2700ft (Swansea QNH 1027mb). The Do228 was VMC and expecting to make a visual approach to RW 04. The pilot reported sighting a C130 less than 1000ft below and shortly afterwards reported seeing a second. The C130s were routing southbound and became visual from the tower with another C130 following making a total of 3. Other traffic in the local area was informed and operations continued as normal.

HQ 3AF comments that the C130 Formation was flying in trail, the lead ac having its TCAS selected on TA/RA and the other 2 having theirs in standby mode. The point at which the C-130s initiated their climb to avoid the LFS opposite direction flow arrow was earlier than might have been reasonable to contact Swansea Approach. Having seen the Do228, the C130 Leader took adequate avoiding action to ensure, by his estimate, vertical separation of 1000ft.

UKAB Note (2): Analysis of the Burrington recorded radar, which provides SSR data only, reveals that at 0927:13 the Do228, squawking A code 7000 with Mode C displaying 034, tracking SE and just clearing from beneath the southern edge of AWY G1, 8.8nm WSW of AMMAN. 5nm to the E and on a converging track is a Mode 3/A squawk code 7000 displaying 015 on Mode C; this is believed to be the C130 Formation Leader; no SSR returns are evident from the other ac in the formation. The Do228 maintains track in a gentle descent, whilst the C130 Formation maintains altitude until 0928:07 when Mode C displays 013. Two sweeps later, at 0928:19, Mode C from the C130 Formation disappears, possibly due to screening as the radar returns converge. No

return is evident from the C130 Formation on the next sweep, at 0928:25, but a return is evident from the Do228 with 027 showing on Mode C. It is apparent that tracks cross just prior to the next sweep, timed at 0928:32, at which time the Do228 Mode C displays 026 and that of the C130 Formation Leader displays 017. This is consistent with pilots' reports and confirms that minimum vertical separation between the C130 Formation Leader and the Do228 was 900ft. Following the reported encounter the C130 Formation maintains track and altitude until 0930:17 when it turns onto a southeasterly track, commences descent to low level and passes 4.2nm W abm Swansea Airport at 0931:00.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included pilots' reports, radar video recording, report from the air traffic controller involved and a report from the appropriate operating authority.

It was evident to members that this encounter, occurring as it did as the Do228 crew were conducting field approach checks, probably came as quite a surprise. Furthermore members thought it probable that the Do228 crew would not be used to seeing a formation of larger ac pass beneath them. However, it was clear that the C130 Formation Leader had seen the Do228 and taken appropriate resolution action by levelling off. Thereby he removed all risk of collision, as confirmed by the fact that Do228 pilot did not have to take any action and the ac passed each other with vertical separation akin to expectations in regulated airspace. Therefore the Board concluded that this was a sighting report.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Sighting report

Degree of Risk: C

AIRPROX REPORT No 163/02.

AIRPROX REPORT NO 163/02

Date/Time: 15 Aug 1405

Position: 5210N 0124W (7nm NNW of Banbury)

Airspace: FIR (Class: G)

Reporting Aircraft Reported Aircraft

Type: LS8 Glider PA34

Operator: Civ Pte Civ Trg

Alt/FL: 2500ft NK

(QFE) (QNH)

Weather VMC CBL C VMC NK

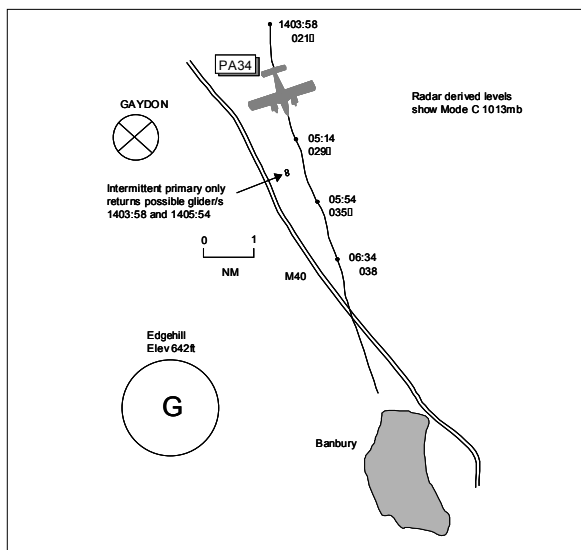
Visibility: 30km NK

Reported Separation:

50ft V 200yd H not seen

Recorded Separation:

not recorded



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE LS8 GLIDER PILOT reports heading 030° at 80kt on a cross-country flight from and to Husbands Bosworth and he was listening out on the Glider common frequency 129.97MHz. The visibility was 30km 1500ft below cloud in VMC and the glider was coloured white and carried no lights. When about 5nm NE of Edgehill glider site cruising at 2500ft QFE, he thought, he spotted a low wing twin engined ac, coloured white/red, converging from his 10 o'clock position range 1nm. He initiated wing-rocking to make his ac more conspicuous, whilst maintaining his heading; there was no reaction from the other pilot. He took no avoiding action as he realised that the other ac was going to pass clear, watching it pass 50ft below and 200yd ahead L to R. Looking at the other ac's track, it seemed to be following the M40 Motorway just to the N of Banbury. He assessed the risk of collision as low owing to the early sighting.

UKAB Note (1): The glider pilot's report was sent to the UKAB almost one month after the event. Tracing action, made difficult by this delay, then identified the wrong ac and it was only after further analysis of the recorded radar - 6 months post incident - that the PA34 was identified.

THE PA34 PILOT was eventually contacted by the UKAB several months post incident and was

able to provide some information from notes kept during his dual instructional training sortie en route to Oxford. Being very familiar with the airspace he had routed towards Banbury and then S (the M40 was a good line feature to assist in navigation) to avoid the Edgehill Glider Site. During this section of his flight leg he was climbing to his cruising level whilst carrying out simulated asymmetric engine failure drills. He did not see the reporting glider.

UKAB Note (2): Met Office archive data shows the QNH for the Banbury area as 1016mb.

UKAB Note (3): The Airprox, as described by the LS8 Glider pilot, is not seen on recorded radar. Analysis of the Cleve Hill radar recording at 1403:58 clearly shows the PA34 3.5nm NE of Gaydon disused airfield tracking 170° climbing through FL021 (2200ft QNH 1016mb). Simultaneously, a single pop-up primary only return, possibly a glider, appears in its 12 o'clock range 3nm. By 1405:14 the PA34 is steady tracking 160° towards Banbury slowly converging with the M40 motorway climbing through FL029 (3000ft QNH) - ROC 700fpm - eventually levelling at FL038 at 1406:34. Meanwhile, one further single radar paint is seen at 1405:54, possibly a glider, in the same position as the previous single return, by which time the PA34 is 1nm to its SE

climbing through FL035 (3600ft QNH). The reporting LS8 pilot reports flying on a heading of 030° at the time of the Airprox in the area to the N of Banbury at 2500ft on the Husbands Bosworth QFE, field elevation 505ft, which equates to 3005ft QNH.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The most important lesson to be learnt from this incident was the need to take prompt reporting action. This delay had caused problems with tracing action and hampered the subsequent investigation.

Although the 'see and avoid' principle pertained during this VFR encounter within Class G airspace, it was not effective on this occasion. The Seneca pilot was technically required to give way to the glider in accordance with the ANO Rules of the Air, but unfortunately he had not seen the reporting glider for understandable reasons. From the PA34 cockpit, the white glider would

almost certainly have been difficult to see flying against a white cloud 'backdrop' slightly above; the 'into sun' aspect was a further disadvantage. It was this non-sighting nevertheless that had caused the Airprox.

Turning to risk, the LS8 Glider pilot had spotted the confliction in good time and had rocked his wings to make himself more conspicuous; this went unseen by the PA34 pilot. The Glider pilot had then elected to continue on track, as no avoiding action was needed, watching the Seneca pass 50ft below and 200yd ahead. From these actions members deduced that the LS8 pilot was always in a position to manoeuvre his ac, if necessary, to avoid the PA34. This led the Board that to conclude that the safety of both ac had not been compromised and there had been no risk of collision.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Non-sighting by the PA34 pilot.

Degree of Risk: C

AIRPROX REPORT No 164/02.

AIRPROX REPORT NO 164/02

Date/Time: 15 Aug 1522

Position: 5020N 0107W (2nm N of the Watford Gap)

Airspace: London FIR (Class: G)

Reporting Aircraft Reported Aircraft

Type: Glider LS8 PA28

Operator: Civ Pte Civ Trng

Alt/FL: 1500ft ALT NR
(QFE) (RPS 1012mb)

Weather NR CLOC VMC CLOC

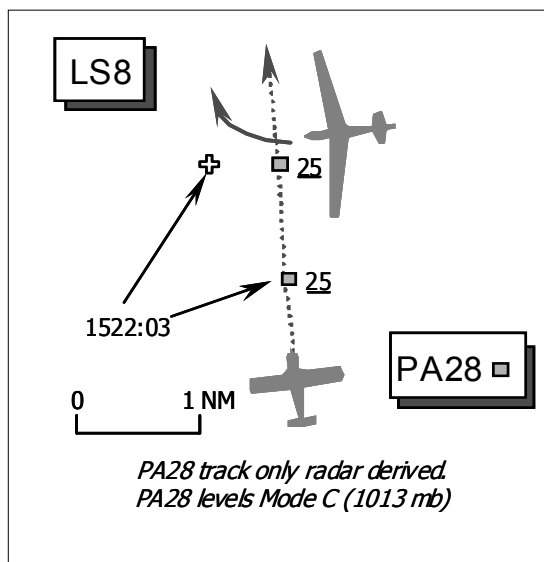
Visibility: 30km 20km

Reported Separation:

30-50ft V/nil H 300ft V

Recorded Separation:

Not recorded



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE LS8 GLIDER PILOT reports that he was circling in his white glider at a height of 1500ft 2nm S of the Watford Gap at 50kt, about 2500ft below cloud with an in-flight visibility of 30km. He was “struggling in a weak lift” at this low height and was watching another glider about 1nm to the SW when he spotted another light ac 200yd away heading directly towards him. The pilot of the other ac – a low winged single-engine ac - took violent evasive action at the last moment, passing 30-50ft – directly overhead his glider before heading off to the N. He added that he had to continue in the turn to minimise any collision risk and that the light ac passed close enough so that he could hear the engine noise as power was applied – it was very frightening.

THE PA28 PILOT reports his ac has a white/blue & yellow colour scheme and HISLs, anti-collision beacon and the landing lamp were all on whilst northbound flying out of the bright sun at 100kt with a clear horizon. He was under a FIS but did not specify the ATSU and a squawk of A7000 was selected with Mode C. A glider was spotted about 1nm ahead but he then lost visual contact when it turned and merged into the background, so he maintained his heading. The Glider then

reappeared low – in his R 2 o'clock about 200m away - crossing from R – L in a climbing R turn. He turned his ac to maintain visual contact with the glider, which passed about 300ft below his ac with “little risk”. He emphasised that it is his company’s policy to fly with all the ac’s lights on and added that this is a regular occurrence in the ‘Open FIR’ during the summer.

UKAB Note: Analysis of the Clee Hill radar recording is inconclusive as the glider cannot be identified. The PA28 is shown transiting the area maintaining 2500ft Mode C (1013mb), which would equate to about 2470ft BARNSELY RPS (1012mb). A primary contact is shown for a few sweeps at 1522:03, about ½nm W of the PA28’s track, but this would not be in accord with the geometry reported by the glider pilot and is, in all probability, not the glider flown by the reporting pilot.

PART B: SUMMARY OF THE BOARD’S DISCUSSIONS

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

The Board recognised that the glider pilot had found himself in a difficult situation “*struggling in a weak lift*”, and apparently restricted in his ability to manoeuvre. The glider pilot reported that he had first spotted the PA28 about 200yd away, which in the Board’s view was too late in the prevailing good weather conditions. Though the PA28 pilot had stressed that he flew with all the ac lights on they would not have been effective here with a bright sun behind the light ac. Whereas the PA28 pilot – without the hindrance of a bright sun - spotted a glider 1nm ahead which may or may not have been that flown by the reporting pilot, he then lost sight of it. Some members were surprised that the PA28 pilot had pressed on towards it when he could not see it. A pilot member thought that an avoiding action turn at that point might have been wise, whereas others reasoned that the glider would not have remained stationary and would have moved unless it was circling in a thermal. A glider - which may or may not have been the same one - was subsequently spotted 200m away by the PA28 pilot, about the same distance as that reported by the glider pilot. It was not clear if the PA28 pilot had spotted the glider flown by the reporting pilot or a different one and the lack of good recorded radar data hampered the Board in its assessment of this Airprox. However, the members agreed

unanimously that it had resulted from a late sighting by both pilots.

With regard to risk; the late sighting from both cockpits did not ensure that safety was assured. However the disparity in the vertical separation reported could not be resolved. The PA28 pilot had not turned to avoid the glider, but reported that he had kept it in sight as it passed some 300 ft below his ac. The separation reported by the glider pilot – 30-50ft – was markedly different and he said he had to maintain the turn, which was in effect an avoidance manoeuvre. But without the benefit of Mode C data for both ac, the vertical separation could not be determined. The differing perceptions by the respective pilots on the geometry of this encounter was so marked as to lead some members to consider that the PA28 might not have seen the LS8 glider at all. Most, however, felt that they had sufficient information to go on and came to the conclusion that the safety of the subject ac had been compromised to the extent that safety had not been assured.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Late sighting by both pilots.

Degree of Risk: B.

AIRPROX REPORT No 165/02.

AIRPROX REPORT NO 165/02

Date/Time: 9 Sep 1054

Position: 5307 N 0319 W (Ruthin)

Airspace: London FIR/ (Class: G)
UKDLFS

Reporting Aircraft Reported Aircraft

Type: EC135T1 Tornado GR4

Operator: Civ Comm HQ STC

Alt/FL: 1500ft 250-800 ft
(QNH 1010 mb) (Rad Alt)

Weather VMC CLBC VMC CLBC

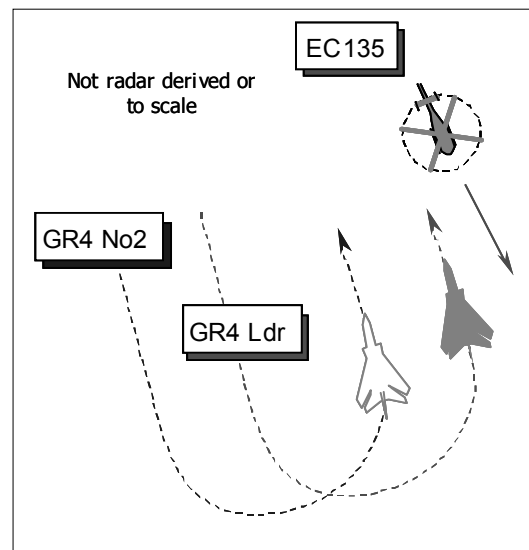
Visibility: 20km 10km

Reported Separation:

500ft V, nil H 500 ft V, 2-3km

Recorded Separation:

Not recorded



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE EC135T1 PILOT reports his helicopter has a blue/yellow livery and the top fin HISL, side strobes and fwd facing landing light were all on; TCAS is fitted. Whilst heading 157°(M) in the vicinity of Ruthin, Wales, flying at 127kt at an altitude of 1500ft QNH (1010mb), TCAS indicated the presence of 3 jets to the W of his track which he had monitored intermittently for about 5 min. At the time of the incident 1 Tornado had been spotted visually about 1nm to the west in a left hand turn, when another of the 3 jets was seen at less than 1 sec before its CPA as it passed 500 ft below his helicopter. He thought that it was tracking the first as both jets were in left hand turns. Neither Tornado pilot acknowledged that they had seen his helicopter, and he was therefore unable to assess the risk because he did not know if they had seen him or not - if they had not done so then he believed the risk would have been "very high". No avoiding action was taken – he spotted the subject jet too late. He added that his workload was focused entirely on lookout due to the TCAS TAs.

THE TORNADO GR4 PILOT reports he was leading a formation of 3 camouflaged GR4s on a 2v1 'bounced' low level training sortie within LFA 7 in N Wales flying between 250-800 ft Rad Alt at

420 kt. They were operating on the LFS frequency and squawking A7001 with Mode C, but neither TCAS nor any other form of CWS is fitted.

The helicopter was first spotted at a range of 4-5km and he provided information calls about the rotary-wing ac's track to the rest of the formation for several min. Whilst leading the pair of GR4s in a routine cross-over manoeuvre, turning from W onto N, no higher than 800ft Rad Alt with the bounce ac over 5km away to the W, he estimated that the helicopter passed about 2-3km to the east of his ac as the pair turned - his ac was the closest to it when the pair steadied northbound. No avoiding action was necessary. At no time did he assess that their proximity to the helicopter was of great concern, his workload was "low-medium" at the time and he emphasised that information RT calls had been given to assist avoidance of the helicopter. He assessed the risk of a collision as "nil".

UKAB Note (1): A review of the LATCC Great Dun Fell radar recording does not illustrate this Airprox clearly and is inconclusive. Therefore, the differing perceptions of the horizontal separation between the jets and the EC135 cannot be

resolved. The Helicopter is only shown intermittently in transit indicating 1600ft Mode C (1013mb) – about 1510ft amsl RPS (1010mb), with several A7001 squawks shown intermittently, manoeuvring 8nm W of the helicopter. At the reported time of the Airprox – 1054, the EC135 is shown briefly at 1600ft Mode C with a A7001 squawk 4nm to the SW, before that also fades.

UKAB Note (2): In a subsequent telephone call between the EC135 pilot and UKAB staff, the helicopter pilot reaffirmed that the nearest of the Tornados had flown 500ft directly below his ac after he had received a traffic advisory. He had been aware of all three jets - but not continuously - and all 3 other crew members were looking out for them. He was fleetingly aware of the most distant of the jets - out to the W - that was probably the Bounce ac.

HQ STC comments that it is impossible to reconcile the two pilots' reports. It is probable that the reporting Tornado leader is not the one that came closest to the helicopter, and perhaps the Airprox Tornado did not see the EC135 so therefore did not file the report. However, without conclusive recorded radar data it is impossible to draw any conclusions about this Airprox.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of the ac involved, and a report from the appropriate operating authority.

Whereas both pilots' reports seem to agree broadly on what took place in terms of the vertical separation between the helicopter and the subject Tornado – 500ft - it was evident that the EC135 pilot's view of the horizontal separation that pertained – nil - was significantly different to that of the lead Tornado pilot - 2-3km. There was no reason to doubt either pilot's version of events, but both could not be correct. Members postulated various scenarios which might account for this anomaly; one theory was that the leader had seen the helicopter, but after the pair rolled out of the turn he might have been mistaken in reporting his ac as being the closest - it could have been the No2 who ended up to the east of the lead ac and

thereby directly underneath the helicopter. It was also feasible, though perhaps unlikely, that the EC135 pilot had seen another (untraced) Tornado, unrelated to the formation's 'bounced' low level training sortie. Another possibility was that this occurrence had happened unseen by the jet pilots at some point a few minutes earlier in their sortie whilst they were concentrating on 'evading' the bounce and before they had detected the presence of the EC135. However, all this was speculation. The STC member emphasised that lookout was a priority in these situations; another member said that the jet leader, having spotted the helicopter and having tracked it for several minutes, would probably have been careful to position his cross-over turn at a point well clear of the EC135's projected track. But again these were all theories and did nothing to explain why 4 pairs of eyes in the EC135 had viewed a jet pass 500ft beneath their helicopter while 4 more pairs of eyes in the GR4s had apparently seen the rotary ac pass 2-3km away. The wide ranging debate was not able to draw an unequivocal conclusion. What was not disputed was the vertical separation of 500ft, which members did not view as dangerous – it was after all akin to the standard separation afforded under quadrantal rules. With all this in mind, members felt there was such a disparity between the two versions of events that it was impossible to render a well founded answer as to the cause of this Airprox, other than a conflict within the UKDLFS/FIR between the EC135 and the Tornado GR4 pair.

Some members were convinced that there was no risk of a collision at all, others not so, because of the wide gulf between the two conflicting versions of the horizontal separation that had pertained. Ultimately the Board came to the conclusion that there was insufficient information available to determine the risk inherent within this occurrence.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in the UK day low-flying system/ FIR.

Degree of Risk: D.

AIRPROX REPORT No 166/02.

AIRPROX REPORT NO 166/02

Date/Time: 9 Sep 1825

Position: 5120N 0016W (6nm E OCK)

Airspace: TMA (Class: A)

Reporting Aircraft Reporting Aircraft

Type: B777 B757

Operator: CAT CAT

Alt/FL: FL90 ↓FL90

Weather IMC KLWD/RAIN IMC NK

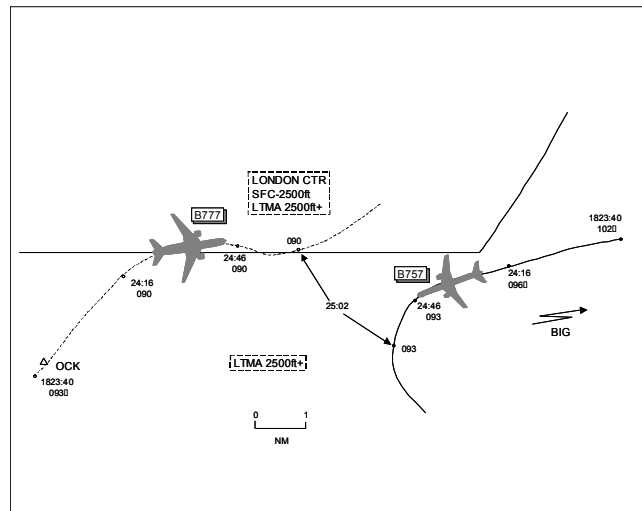
Visibility:

Reported Separation:

800ft V 2nm H 300ft V 3nm H

Recorded Separation:

300ft V 2-6nm H



BOTH PILOTS FILED

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE B777 PILOT reports entering the OCK hold at 220kt in a R turn at FL90. ATC gave an avoiding action L turn onto heading 360° simultaneously with TCAS giving a TA alert on opposite direction traffic in his 1 o'clock range 2nm 300ft above. Once he had commenced the turn, the alert ceased with the other ac passing clear to his R 300ft above. He assessed the risk of collision as medium.

THE B757 PILOT reports leaving the BIG hold on radar heading 260° at 210kt in a descent to FL90. When descending through FL93, ATC issued an avoiding action L turn with TCAS giving a TA alert, indicating traffic 200-300ft below; the other ac passed 3nm clear and 300ft below. He assessed the risk of collision as medium.

ATCI (LTCC) reports that the Airprox occurred 6nm E of OCK at 1825 UTC. The controller involved was the Heathrow Intermediate Director (South) (LL INT DIR S) and his traffic loading at the time was stated as moderate. Both ac were inbound to Heathrow for RW 27L, the B757 from Paris Charles de Gaulle and the B777 from the USA.

The B757 established contact with LL INT DIR S at 1820, reporting that it was descending to FL120

in the BIG hold. The call was acknowledged and the ac cleared down to FL100, with instructions to leave BIG on a heading of 270° at a speed of 210kt. Immediately thereafter the B777 established contact with LL INT DIR S, reporting that it was passing FL112 in the descent to FL100 and tracking towards OCK to take up the hold. The ac was advised to expect a five min delay at OCK and instructed to descend to FL90.

At 1821:36 the B757 pilot was instructed to descend to FL90 which he clearly and accurately acknowledged; at that time he was setting course from the BIG VOR. Two min later, as the ac was descending through FL102, the B757 was instructed to turn L 10° onto heading 260° followed at 1824:15 by a R turn onto heading 090°.

It was at this point that the LL INT DIR S recognised that the B757 had descended below FL100, the level to which he believed he had cleared the ac and recognised the potential confliction with the B777 which had by now commenced the outbound turn at OCK at FL90. The INT DIR S told the B757 pilot to stop his R turn and to expedite a L turn onto 180° for avoiding action and then he instructed the B777 pilot to stop his R turn in the hold and to turn L onto

360° for avoiding action. The B757 pilot was then further instructed to turn L onto 090°, which was acknowledged, advising that he had the other traffic on TCAS. STCA (Short Term Conflict Alert) activated with a low severity alert approx 30 sec later as the ac initiated their avoiding action turns.

Separation reduced to a minimum at 1825:02 as the B757 was turning through S indicating FL93, with the B777 NW of it by 2.6nm and 300ft below. Separation was restored within 20 sec as both ac turned away from each other, the result of well applied avoiding action by the Director. The minimum separation was outside Separation Monitoring Function (SMF) parameters, thus it was believed at the time that separation had been maintained throughout the incident. However, a later radar replay of the event determined the actual distances between the ac involved.

ATSI endorsed the ATCI report. From the controller's post incident questionnaire, it would appear that he had made a plan of keeping the B757 at FL100 and then, inexplicably, descended it to FL90 and into direct conflict with the B777. He could not account for why he had done this even after having had time to reflect on the incident. There were no distractions and it almost appears to have been a mis-match between his planned and actual action. As soon as he saw that the B757 had descended below FL100, he took action to correct the situation.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

ATCO members informed the Board that one method normally utilised by the INT DIR during

RW 27 arrivals was to descend traffic leaving the BIG stack in the radar sequence to a level 1000ft below the traffic holding at OCK. This was necessary because of the shorter track distance available from the easterly stack at BIG to touchdown - traffic had to be at a lower level for the required descent profile. On this occasion, the controller had intended to leave the B757 1000ft above the B777 during the early vectoring phase. However, immediately after descending the B777 in the OCK hold to FL90 and, contrary to this plan, in the next transmission he then inexplicably descended the B757 to the same level. This action had put the ac onto conflicting flight paths and had led to the Airprox.

Later as the INT DIR instructed the B757 to turn R onto 090°, he noticed that it had descended through what he believed was its cleared level. Very quickly, he initiated avoiding action by turning both ac in opposite directions, prior to STCA activating, and he almost maintained standard separation in the process. From the pilots' perspective, members understood the unease felt by both crews. They were in IMC and ATC had issued 'turn reversal' avoiding action instructions while simultaneously both had received TCAS TA alerts. But as the situation unfolded it was shown that the prompt reactions by both crews had almost immediately taken the ac out of conflict, with TCAS alerts ceasing and the equipment indicating 2-3nm horizontal and 300ft vertical displacement. It was agreed that the 'potential' for a more serious conflict situation had very quickly become benign, as all parties had taken rapid and effective action that removed any risk of collision.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The LL INT DIR S controller descended the B757 to the same level as the B777.

Degree of Risk: C

AIRPROX REPORT No 167/02.

AIRPROX REPORT NO 167/02

Date/Time: 10 Sep 1035

Position: 5154 N 0317 W (6nm SW Brecon)

Airspace: London FIR/ (Class: G)
UKDLFS

Reporting Aircraft Reported Aircraft

Type: JetRanger Tornado GR4 x2

Operator: Civ Comm HQ STC

Alt/FL: 600ft agl 350ft agl
(Rad Alt)

Weather VMC VMC

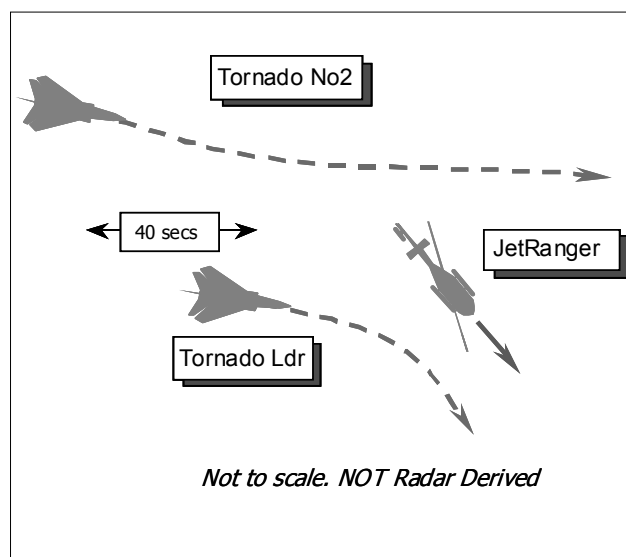
Visibility: 40km >30km

Reported Separation:

100ft H, nil V ½nm H, 100 ft V

Recorded Separation:

Not recorded



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE JETRANGER PILOT reports that his helicopter has a silver livery and HISLs and the landing light were selected on whilst conducting a pipeline inspection at 105kt. The transponder was selected to the inspection squawk of A0036 with Mode C, but TCAS is not fitted. About 6nm SW of Brecon, heading 150°(M), flying at an estimated 600ft agl, he heard a noise to the R and saw a Tornado pass 100ft away down the starboard side at the same height. His observer looked to the L rear and instructed him to turn R and descend, but before he could react a second Tornado passed down the port side also 100ft away at the same height. No avoiding action was taken as the Tornados had approached from astern and were not seen until they passed. He assessed the risk as “high”.

THE TORNADO GR4 PILOT (LDR) reports that he was leading a pair of camouflaged grey/green Tornado GR4s engaged on a low level training exercise through LFA7 on similar tracks. HISLs were on and he was squawking A7001 with Mode C, but neither TCAS nor any other form of CWS is fitted. Flying at 480kt and about 350ft agl, he was approaching the ‘Initial Point’ (IP) in 40sec trail formation on a track of 100°(T) for the ground target. As he descended towards lower ground, he acquired a helicopter - described as pale against a dark wooded hillside - about 1nm away

in his 11-11:30 position. He broke R into a hard climbing turn and estimated that he passed no closer than ½nm to the S of helicopter and about 100ft above it. An RT warning was made to his No2, but this was not heard. He assessed the risk of a collision as “slight”. He added that the Airprox occurred in the open FIR and in good weather away from any notified helicopter routes or NOTAMS.

THE TORNADO GR4 PILOT (No2) reports that he was flying as the No 2 of the GR4 pair about 40 seconds behind his leader flying a track of 108°(T); his workload at the time was low. He spotted the helicopter at about 1nm range at R 1 - 2 o'clock and flew a gentle climbing L turn away to ensure safe separation whilst keeping the helicopter in sight to the S. Although at similar heights, the lateral separation was assessed as ½nm and the flight path of his ac and the helicopter were never crossing. He also thought that there was a low risk of collision, as the helicopter had been seen and appropriate avoiding action taken.

UKAB Note (1): Both Tornado GR4 crews attributed the relatively late sighting of the helicopter to the fact that it was initially below their flightpath and against a wooded hillside.

UKAB Note (2): In a subsequent telephone conversation with UKAB staff, the JetRanger pilot reaffirmed that the horizontal separation against both jets was 100ft and that they passed within a few seconds of each other, he did not believe that the time interval was in the order of 40sec. He reaffirmed that he had been flying at 600ft agl and that the Airprox position given - OS grid SO 120 115 - was extremely accurate, he thought, and derived from GPS data.

UKAB Note (3): The Airprox occurred below the coverage of recorded radar.

UKAB Note (4): The Pipeline and Powerline Notification System (PINS) stipulated in the Mil AIP Vol 3 and AIC 54/2001 (Yellow 51) promulgates details of the inspection routes associated with pipelines and the regional areas that can be notified by companies to LFBC for helicopter gas pipeline inspections. The closest PINS Gas Areas are E1, 2 10 & 11. A search through the PINS warnings issued for this day revealed that these areas had not been notified by the company to LFBC for activation and inclusion on the PINS NOTAM for this day. Consequently, NOTAM UKLB2212 PINS AM, transmitted by LFBC on 091904ZSEP 2002 did not promulgate a warning of the inspection flight in these areas to military crews.

THE TORNADO GR4 PILOTS' UNIT noted the different perceptions of the Airprox, as reported by the Tornado and helicopter crews and carried out a study in an attempt to clarify the positions and sequence of events. As the Tornados were approaching their IP on the far side of the valley, their tracks over the ground were known with considerable accuracy.

The bearing and distance of the helicopter when first sighted by the lead Tornado pilot, combined with information from the helicopter itself, would suggest the JetRanger was positioned centrally in the valley. A similar analysis of the second Tornado pilot's report places the helicopter at a position in the valley which matches the helicopter's reported track. Additionally the distance between the plots is 1.2nm, which is the distance the helicopter would have travelled at 105kt in the 40sec between the passage of both GR4 ac. Assuming the crew's assessments of bearings and distances to be correct, this would

indicate a minimum horizontal separation **without manoeuvre** of 2000-2500ft.

For closer miss distances of the order of 100ft to be achieved, it would be necessary for both Tornado pilots to have overestimated the first sighting distances (clock-code bearings are likely to be accurate) and for the helicopter to be on a similar track to the Tornados. Based on the available information, the horizontal separation would have been nearer to the Tornado pilots' estimates. It is most likely that a combination of mis-judged distances and tracks by all concerned resulted in a true separation somewhere between the 2 estimates of 100ft and ½nm. In any event, the Tornado crews saw the helicopter, considered there was but a "slight" risk of collision, and took avoiding action to increase separation.

HQ STC endorsed the Station's comprehensive analysis.

UKAB Note (5): The pipeline company subsequently provided a copy of the GPS plot of the JetRanger's track adjacent to the pipeline, which indicated a 'track made good' through the valley of the River Usk of 135°(M) in the vicinity of the Airprox, but no time or height was indicated. This track was plotted and correlated with the reported track of the GR4 pair approaching the IP, but without time synchronisation the horizontal separation cannot be determined with certainty.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of the three ac and a report from the appropriate operating authority.

Evidently, no notification had been received at the LFBC about the route of the pipeline inspection helicopter. Consequently, the NOTAM covering PINS movements for that day did not include the B206 pilot's flight. Though this omission was a cause for concern, insofar as an established system for notifying military pilots about other activities in the low-level environment had fallen down, the Board was keenly aware of the inherent limitations of the PINS system - a large geographical area is notified for a whole morning, but the helicopter's timing or the route through these areas can never be known with any

AIRPROX REPORT No 167/02.

certainty. Because of this, members did not believe the lack of a NOTAM here had any significant effect and had not materially effected the cause of this Airprox.

From the report by the Tornado pilot's Unit the 'IP' selected by the GR4s - by chance - happened to be near the JetRanger pilot's track at the time. The Board was advised that the jet crew's navigation would necessarily have been very accurate up to this point, to achieve their respective separation times over the exercise target; for the mission profile flown, a deliberate stagger - in the order of 40sec between ac - was built in to avoid 'damage' from the simulated weapons released by the ac in front. Whereas the helicopter pilot was adamant that the jets had flown by in a much shorter time span, the Tornado crews said this was not the case. The Board had no reason to doubt either pilot's version of events, but it was clear that a conflict had arisen between the B206 and the two jets and so one account of events was not accurate. Although the pipeline company had provided GPS detail from the JetRanger's flight, there was no correlation between this and the tracks flown by the Tornados (from recorded radar data), which could help to resolve the wide discrepancy between the helicopter and jet pilots' reports - both in terms of time and the horizontal separation. The JetRanger pilot's view was that after approaching from astern unseen the lead Tornado's jet noise had warned him as it passed 100ft down the starboard side at the same height as his helicopter, followed very shortly afterwards by the No2 at the same distance to port, a matter of seconds later. This did not jibe with the lead GR4 crew's perspective (after spotting the helicopter 1nm away the pilot had turned hard R and climbed to pass 3000ft to the S and about 100 ft above the JetRanger) nor that of the No2 crew, whom, though they had not received their leader's RT warning had spotted the helicopter, and like their

leader, had given the JetRanger the same degree of separation to the N. It was clear that the JetRanger pilot would have been unsighted on both jets until just before they had passed, so some members wondered if the 'fright factor' had produced a detrimental effect here. Nevertheless, a commercial helicopter pilot member said that the jets would have needed to have been very close to be heard above the ambient noise of a JetRanger's cockpit, which he believed lent support to the helicopter pilot's contention. Another member voiced concern that at a distance of 100ft the buffet from both jets, passing in short succession, would have been considerable, whereas no mention had been made of this in the Jetranger pilot's report. These were both, however, solitary views. Some suggested that the jet pilots had resolved this conflict by their avoiding action. Conversely, if they had passed 100ft away others thought that this hardly amounted to a resolution of the conflict. After wide-ranging debate, the overwhelming majority of members felt that there was such a disparity between the two versions of events that it was impossible to render a well founded answer as to the cause of this Airprox, other than the self evident conflict within the UKDLFS/FIR between the B206 and the Tornado GR4 pair. Furthermore, there was unfortunately such a wide gulf between the two conflicting versions of separation between the ac that the Board concluded there was insufficient reliable information available to determine the risk inherent within this occurrence.

PART C: ASSESSMENT OF CAUSE AND RISK

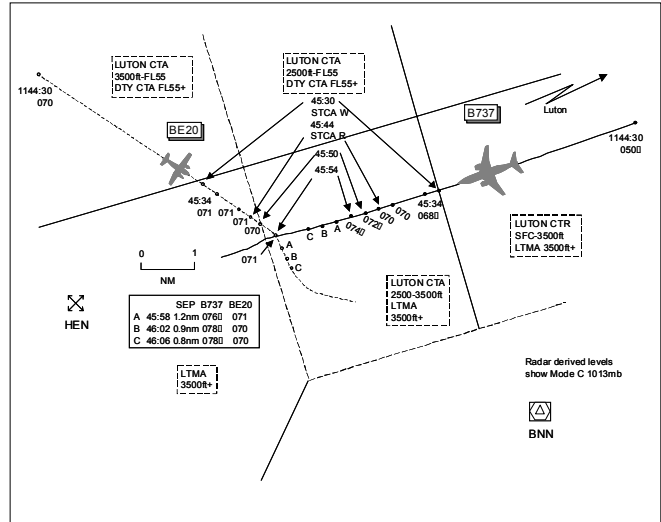
Cause: Conflict in the UK day low-flying system/ FIR.

Degree of Risk: D.

AIRPROX REPORT NO 168/02

Date/Time: 10 Sep 1146
Position: 5146N 0041W (5nm NW BNN)
Airspace: TMA (Class: A)
Reporting Aircraft Reported Aircraft
Type: B737 BE20
Operator: CAT Civ Comm
Alt/FL: FL70 FL70

Weather VMC CLOC VMC CLOC
Visibility: 10km >10km
Reported Separation:
 400ft V <1nm H 0ft V >1nm H
Recorded Separation:
 500ft V 1.2nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE B737 PILOT reports outbound from Luton to Paris heading 254° at 250kt climbing to FL70 and in receipt of an ATS from London. Approaching HEN climbing through FL65, TCAS announced "traffic", which was spotted in his 2 o'clock range 5nm. His ac AP was in ALT ACQUIRE Mode so this was not altered as he watched the conflicting traffic rapidly approaching on its crossing track. Simultaneously with TCAS giving an RA "climb", ATC issued a L turn onto 180°. He ignored the turn instruction, as it was issued too late, and replied "negative, TCAS climb". The other ac, a small twin turbo-prop, passed 400ft beneath and <1nm ahead whilst it was seen to be manoeuvring, although no communications were heard to be addressed to another ac on the frequency. He levelled his ac at FL80 and continued tracking towards HEN and he assessed the risk of collision as medium.

THE BE20 PILOT reports heading 155° at 230kt inbound to Northolt and in receipt of an ATS from London. TCAS was not fitted to his ac. When approx 2nm NW of BNN, ATC issued an immediate R turn onto 180° followed by an avoiding action further 10° R turn onto 190°. Whilst commencing the turn, he caught a glimpse of a twin engined jet ac in his 9 o'clock <1nm away heading towards him at a similar level. Just as he rolled his wings level ATC then ordered an immediate L turn onto 090° with traffic 12 o'clock

range 1nm, he thought. He saw this ac ahead but he had no further sighting of the previously sighted twin jet. He assessed the risk of collision as high. The flight continued to destination with no further comment being made over the RT. He contacted LTCC after landing and was informed by the Supervisor that an immediate investigation was taking place into the incident and that nothing else was required from him unless he wished to file an Airprox. Furthermore, as he was told that contact would be made at a later date; he took no further reporting action until he was contacted by the UKAB and submitted a completed CA1094 form in response to the reporting B737.

UKAB Note (1): During a subsequent telephone conversation, the BE20 Capt confirmed that he only saw the B737 once, very briefly as he had started the initial turn onto S; the B737 had been pointing straight towards him. He thought the second ATC avoiding action L turn onto E was against another ac in his 12 o'clock, which he saw ahead. The recorded radar does show another ac 5 nm ahead of the BE20's track turning R through a SW heading, entering the BNN hold at FL80.

ATSI reports that at the time of the Airprox, the B737 was under the control of the TC North West Departures/Bovingdon (TC NW) SC whilst the BE20 was under the control of the Heathrow Intermediate North Director. The TC NW SC

AIRPROX REPORT No 168/02.

reported his workload as low and the Heathrow INT (N) Director described his as medium.

The BE20 was inbound to Northolt from Teesside. The ac established communication with the TC NW SC at 1138, descending to FL150 to be level 30nm before BNN, on radar heading of 155°. The SC at the time, who was not the one in the position at the time of the Airprox, instructed the crew to descend to FL70 to be level abeam WCO. He informed the crew “..... we'll get you underneath the Bovingdon stack for Northolt”. The unit's MATS Part 2 states that the Minimum Stack Level at BNN which at the time of the Airprox was FL70, is allocated to TC North West Deps. The SC, who at the time of the Airprox was in the TC NW Deps/ BNN position, stated that it was not his normal operating practice to allocate a Northolt inbound the Minimum Stack Level. He usually kept such traffic at a slightly higher level and effected a release to Heathrow in the normal manner. It would only be in exceptional circumstances, such as the BNN stack being quite full, that he would consider the use of the Minimum Stack Level.

At 1141:20, when the BE20 was approximately 25nm NW of Bovingdon, the SC instructed the crew to resume their own navigation to BNN and contact Heathrow Director. On first contact with Heathrow, the Director instructed the crew to leave BNN heading 160° and, after passing BNN, to reduce speed to 210kt or less. Whilst this was taking place, the controller on the TC NW position was changed and, at 1143:10, the B737 pilot reported on frequency, having departed from Luton, climbing to 5000ft.

The new TC NW SC reported that he was scanning the radar and observed a Heathrow outbound, which was maintaining 6000ft, as is standard. Although he had a fps showing the BE20 at FL70 under the BNN designator, he 'forgot' the presence of this ac and concentrated on climbing the B737 subject to the Heathrow outbound. With hindsight, it is possible that, as the BE20 was at an 'outbound level', it might have been better to have either annotated it, to make it prominent, or 'cocked it out' in order to draw attention to the fact that it was a 'non-standard' situation. At 1144, when the Heathrow outbound had started to climb and was N of the B737's track, the SC instructed the crew of the B737 to climb to FL70. At that time, the BE20 was in the 1

o'clock position of the B737 at a range of 14.2nm, maintaining FL70 on a converging track.

During his routine scan of the radar, the NW SC saw the conflict between the BE20 and the B737 and, at 1145:35, transmitted to the B737 “.....avoiding action heading one eight zero degrees immediately”. By that stage, the BE20 was in the one o'clock position of the B737 at a range of 4nm. STCA had activated at 1145:30, and changed from low (white) to high (red) severity alert at 1145:44. Whilst the SC was passing avoiding action to the B737, the Heathrow Director had also seen the conflict and transmitted “BE20 c/s turn right immediately heading one eight zero degrees”. This was read back correctly and then the Heathrow Director instructed the BE20 “...avoiding action turn right now heading one nine zero degrees”.

The TC NW SC passed TI to the B737 who reported the traffic in sight. At the same time the SC telephoned the Heathrow Director who answered the telephone and said “I'm turning right on to one nine zero”. The SC replied “He's going one eighty”. At 1145:50, the two ac were still converging at a range of 2nm with the BE20 maintaining FL70 and the Mode C readout of the B737 indicating FL72. Almost immediately after this the SC received a clipped transmission from the B737 which was “...AS climb B737 c/s”. Following the telephone conversation, at 1146:00, the Heathrow Director instructed the BE20 to “...turn left immediately heading zero nine zero degrees...” and passed TI on the B737.

UKAB Note (2): The RT transcript reveals the TI passed was “...there's traffic in your left eight o'clock a range one mile”. As revealed earlier in Note (1), the BE20 Capt had believed that ATC had passed TI as 12 o'clock and responded being visual with a second ac ahead.

The crew of the BE20 reported traffic in sight. Separation was at a minimum at 1145:58, when the BE20 was in the 12 o'clock position of the B737 at a range 1.2nm, and 500ft below it. The crew of the B737 climbed to FL81 before the SC advised them that they were well clear of the traffic and instructed them to maintain FL80.

The BE20 had been allocated the flight status of 'HOSP' (i.e. hospital) although the operator confirmed later that it was, in fact, a positioning

flight in order to collect a patient. The unit report suggests that the previous NW/Dep's controller in this position afforded priority to the BE20, by descending it to the Minimum Stack Level, owing to its flight status.

The TC NW SC advised that he was told about the BE20 when he took over the position and noticed the strip under the BNN designator of his fps display. He stated that although the flight had been pointed out, it had not fully registered with him. He followed his usual operating practice, when the B737 called, and looked for any northbound departures from Heathrow, which may affect issuing a climb clearance to the Luton outbound, which has to be at the Minimum Stack Level by 11nm NE CPT. When he saw the confliction between the BE20 and the B737 he immediately rang the Heathrow Director and, while waiting for the telephone to be answered, can be heard to say "...forgot all about the seven". Although the B737 was passed avoiding action and acknowledged it, the aircraft continued on its heading of approx 254° towards HEN. The SC advised that he had not noticed the ac was not turning due to label overlap. In the crew report, submitted after the Airprox, they state that when the SC passed avoiding action they replied "*Negative TCAS climb.....*". Analysis of the RT recording indicates that the first part of this transmission was clipped and so would not have been heard by the SC.

The Heathrow Director, having spotted the confliction, turned the BE20 R onto 180°. He later advised that initially he had not used the words 'avoiding action' as he wanted the ac to turn as soon as possible and would then refine the phraseology. He opted to turn the BE20 further R onto 190° in order to maximise lateral separation as soon as possible. However, after the telephone conversation with the TC NW SC, he was under the impression that the B737 would be turning L and so opted to reverse the turn for the BE20 and turned it L onto 090 degrees. This, he hoped, would take the aircraft behind the B737. Analysis of the radar recordings indicate that it is unlikely this objective would have been achieved, however, given the delay in updating the radar picture as viewed by the controller, it is possible that the geometry of the two ac was, at the time the third turn instruction was issued, different to the radar picture obtained from the recording.

Both controllers advised that they were aware of the 'new avoiding action phraseology' and had practised it as part of their TRUCE training, one in January and the other only two weeks before this AIRPROX. The TC NW SC stated that, in his opinion, this phraseology was too lengthy and delayed the process of passing the essential executive instruction(s).

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members commended ATSI for their comprehensive report. ATCOs agreed that it was unusual to descend traffic to MSL but understood the reasoning behind the off-going NW SC's rationale in affording the BE20 priority owing to the allocated 'HOSP' status. However, even though the 'non-standard' situation was pointed out to the on-coming SC at handover, the new controller then reverted to his normal 'modus operandii'. Forgetting about the presence of the Beech, even though the fps was in place under the BNN designator, he climbed the B737, when it was clear of a Heathrow outbound, into conflict with the BE20 - this had caused the Airprox. As a side issue, the NATS advisor confirmed that the CAA had agreed to review avoiding action phraseology in light of comments made by controllers during this and a number of previous Airprox.

Turning to risk, the Heathrow INT DIR N and the TC NW/DEPS SC both saw the confliction as STCA activated. Unfortunately, both chose to give their respective ac a turn into the same piece of airspace. The BE20 executed the R turn as instructed and, although not given TI and without the benefit of TCAS, he saw the B737 in his 9 o'clock position <1nm away at the same level as he crossed ahead of its intended track. The B737 crew were given the 'heads up' early in the proceedings by a TCAS TA "*traffic*" alert and this enabled them to see the conflicting BE20 visually, in their 2 o'clock range 5nm. Simultaneously with ATC issuing an 'avoiding action' L turn, an RA "*climb*" was received; he followed the TCAS

AIRPROX REPORT No 169/02.

guidance and informed ATC of his non-compliance with their turn instruction. During this phase he had watched the BE20 cross <1nm ahead and 400ft below. Because the subject ac had flown in close proximity during the encounter within Class A airspace, despite ATC intervention, one member thought that safety had been compromised. This view was not shared by the majority. ATC aspects had certainly been untidy - TI only had been passed to the B737 crew and the 'avoiding action' safety net had worked only partially - but the turn by the BE20, plus the visual sighting (of the BE20) and prompt reaction to

TCAS by the B737 crew were enough to persuade the Board that any risk of collision had been removed.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The new TC NW/DEPS SC climbed the B737 into conflict with the BE20.

Degree of Risk: C

AIRPROX REPORT NO 169/02

Date/Time: 11 Sep 1457

Position: 5050N 0350W (2nm SW Tawbridge)

Airspace: FIR/UKDLFS (Class: G)

Reporting Aircraft Reported Aircraft

Type: Bo105 Jaguar T2A

Operator: Civ Comm DPA

Alt/FL: 1200ft 800ft

(QNH 1027mb) (Rad Alt)

Weather VMC CAVOK VMC CAVOK

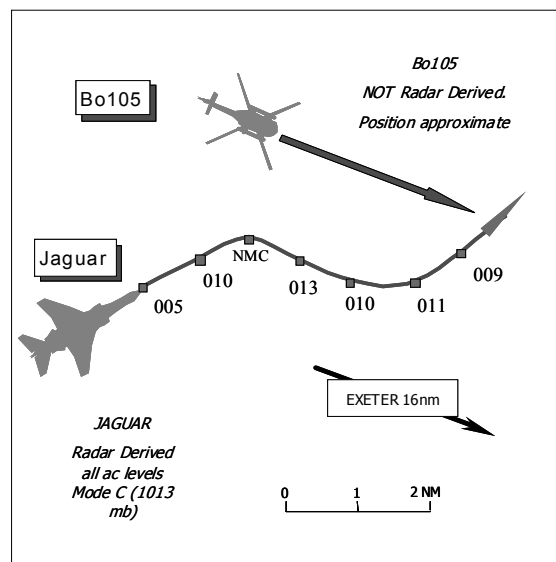
Visibility: 50+km 50+km

Reported Separation:

150m H, 50ft V 200m H, 100ft V

Recorded Separation:

NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE Bo105 PILOT reports that he was engaged on an air ambulance mission en route to Exeter. His helicopter was coloured red and strobes were on. Transponder was on but Mode C was reported as not fitted. No narrative was supplied, but the pilot's diagram of the Airprox indicates the other ac, which was reported as a 2 seat Jaguar, approached from the 4 o'clock position, passed in front of the helicopter from R to L and continued on in a straight line. First sighting distance was 150m and the Jaguar passed with 50ft vertical separation. No avoiding action was taken and the risk was described as "high". The pilot had tried to contact Exeter just prior to the Airprox but this had

not been possible due to range; so at the time of the Airprox he was not in receipt of an ATS. The Airprox was later reported to Exeter on RT.

[UKAB Note: The pilot's report is incomplete in some respects. The first sighting distance of 150m is probably the minimum lateral spacing but not directly reported as such. The pilot does not state at which point he first saw the Jaguar.]

THE JAGUAR T2A PILOT reports that he was conducting a low level exercise which included a demonstration of a pull-up attack profile. He was not in receipt of an ATS but was squawking 7001

with Mode C. The ac was coloured red, white and blue and HISLs were on. The initial part of the attack run was flown at 300ft agl and 450kt on a north easterly heading. The ac pulled up into a 10° climb before rolling right into a dive attack. Following a 4g wings level recovery from the attack, the ac commenced a climbing L turn onto N, levelling at 800ft agl. The helicopter was immediately seen in the 10 o'clock position at about 500m. It was too late to take avoiding action, and the relative velocities were such that no collision risk existed. However, the potential for a collision was high even though the flight paths did not cross. The helicopter, which was about 100ft above the Jaguar, was passed with 200m lateral separation. Although conditions were good, the helicopter had not been seen prior to the pull up when it would have been at about 3nm range, and the pilot thought that the nature of the demonstration attack may have provided a distraction.

UKAB Note (2): Radar recording is inconclusive as the Bo105 cannot be seen. However, it shows that although the Jaguar turns onto N, as reported by the Jaguar pilot, it actually rolls out on a north easterly heading for a while, which is when the Airprox occurs.

THE JAGUAR PILOT'S UNIT comments that the weather at the time was exceptionally good for low flying and the Jaguar pilot was extremely experienced in the ground attack role. This incident is an example of how difficult it can be at low level to see small helicopters at anything other than short ranges. Fortunately, in this case the flight paths did not cross and there was no actual risk of collision, despite the potential.

DPA comments that the very experienced Jaguar pilot is the first to admit that this was a late sighting by both pilots. Though the flight took place in excellent weather, the background and relative motion of the Bo105 made it difficult to see. In any event, there was little the Bo105 could have done

within the time available. There is a need to conduct such training, and the area in which the Airprox occurred is considered ideal in respect of terrain and airspace. As always with this type of incident, it will be heavily publicised within DPA Flight Safety publications to reinforce the "see and avoid" message.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Board members were agreed that both pilots had every opportunity to see the other ac, although both remained unsighted until late. A military pilot member suggested that, in the case of the Jaguar pilot, part of his attention would have been on his instructional task as he demonstrated the pull-up attack profile. Moreover, both ac were at low level, and may have been screened by terrain. When discussing the altitude of the Bo105, a civil helicopter pilot member accepted that the Bo105 pilot was quite low but suggested that this may have been determined by the condition of the patient onboard. Whatever the case, neither pilot, by his own admission, visually acquired the other ac until very late. As a consequence each was unable to influence the course of events despite their close proximity and the minimum reported separation, over which there was little dispute between both pilots, was the result of fate rather than action by either. Accordingly, members agreed that while the ac were not going to collide safety had indeed been compromised.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Late sighting by both pilots.

Degree of Risk: B

AIRPROX REPORT No 170/02.

AIRPROX REPORT NO 170/02

Date/Time: 11 Sep 1241

Position: 5302N 00054W (Overhead RAF Syerston - Elev 224ft)

Airspace: Syerston ATZ (Class: G)

Reporting Aircraft Reported Aircraft

Type: Viking Glider C172

Operator: HQ PTC Civ Pte

Alt/FL: 700ft 2000ft
(QFE 1022mb) (Unspecified QNH)

Weather VMC CAVOK VMC CAVOK

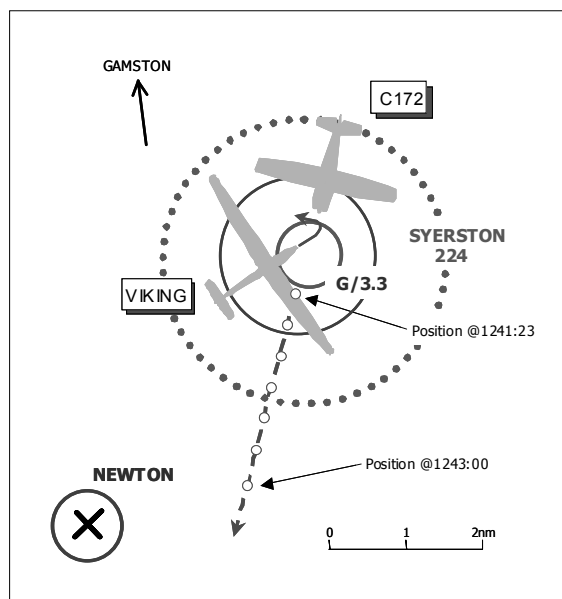
Visibility: 30km >7km

Reported Separation:

600ft V, 400m H Not Seen

Recorded Separation:

NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE VIKING T1 GLIDER PILOT reports that he had commenced a winch launch from Syerston RW 07L and was climbing at 60kt on hdg 070°, in good visibility, and in contact with Syerston Radio on 125.425MHz. His glider was white with orange dayglow markings on the wings. [UKAB Note: It was subsequently confirmed by HQ Air Cadets that the Viking T1 Glider was coloured white with, for maximum conspicuity, red dayglow nose and wingtips plus 2 large, orange dayglow patches on each wing upper surface.] Passing approximately 550ft he heard a call on the radio reporting that there was an ac passing close to the winch line and advising that he should release from the launch cable. He released at 700ft and at the same time caught sight of a light ac crossing above from L to R. He estimated that it was between 1300 and 1500ft aal and flying straight and level. He turned L in the direction of the circuit and away from the ac, which he recognised to be a Cessna. Winch launching on the day was routinely achieving heights of between 1600 and 1800ft aal. Therefore, he assessed that if the launch had not been aborted the risk of collision would have been high.

THE C172 PILOT reports that he was en route from Gamston to Blackbushe and that his ac was blue and white and equipped with a HISL, which

was selected on. He was in contact, he thought, with Gamston Radio on 130.475MHz. He was hdg 185° at 90kt and flying at 2000ft on a QNH, which he cannot recall, and was operating in good VMC, well clear of cloud and with approximately 7 to 10km forward visibility. He was unaware of the reported incident until requested to telephone Syerston upon landing. It was only during this call that he learned that glider winching was in operation at Syerston.

THE EAST MIDLANDS APPROACH RADAR CONTROLLER reports that the C172 pilot called on 134.17MHz to obtain crossing clearance of the East Midlands eastern CTA. SSR Mode A code 4550 was allocated and after several incorrect selection attempts, the correct code was observed and the ac placed under a FIS for CTA crossing. Shortly afterwards, Waddington rang to request identification of the 4550 squawk, which ac they had been tracking as it was believed that it had previously infringed the Syerston ATZ. When under service from East Midlands Approach the C172 was at 1800ft on the East Midlands QNH 1029mb.

THE VIKING GLIDER PILOT'S UNIT comments that this incident highlights, once again, the lack of awareness of some pilots to the dangers of flying

close to winch-launched glider sites. A glider pilot's forward view is restricted by the very high nose up attitude achieved during the winch launch. Had the Duty Instructor not alerted the glider pilot to the presence of the Cessna, and the launch had not been aborted, the Cessna would have been very close to the glider. Even if the Cessna had missed the glider, it still stood a good chance of colliding with the 5mm steel winch cable, with obvious potential consequences.

The airspace released to open FIR by the closure of RAF Newton provided Syerston with a brief respite from zone infringements. Syerston is the bottleneck between East Midlands airspace and the Cottesmore/Cranwell/Waddington MATZs.

HQ AIR CADETS comments that Syerston lies between 2 line features – the River Trent and the A46 trunk road. It is therefore prone to ac taking the 'easy' nav route, and is often infringed as a result. It is only the constant vigilance of all concerned with the flying operations at Syerston that a major incident has not occurred. SRG are requested to publicize the dangers associated with winch launching sites to as wide an audience as possible.

HQ PTC comments that it shares HQ Air Cadets' concern over the prevalence of such incidents, particularly at Syerston. Steps have been taken to improve the capability of such Units to cope with transit GA traffic and the HQ will look again at the promulgation of their frequencies. However, if such traffic does not call, little can be done to anticipate the disregard of the risks involved in over flying winch-glidering sites.

UKAB Note (1): UK AIP ENR 2-2-2-5 promulgates the Syerston ATZ as a "*Circle radius 2nm centred on the longest notified runway (07/25) 530121N 0005447W. Vertical Limit 2000ft aal. Callsign Syerston Radio. Hours of Service 0830 – SS (1 hr earlier in Summer). Frequency 125.425 MHz A/G*".

UKAB Note (2): UK AIP ENR 1.1.5 para 5.1.1 states: "*Glider launching may take place from designated sites which are regarded as aerodromes. The sites are listed at ENR 5.5.*"

UK AIP ENR 1.1.5 para 5.2.1 states "*Gliders may be launched by towing aircraft, or by winch and cable or ground tow up to a height of 2000ft agl.*

At a few sites the height of 2000ft may be exceeded (see paragraph 5.3). The cable launching of the aircraft may be encountered within the airspace contained in a circle radius 1.5nm of the notified position of the site."

UK AIP ENR 1.1.5 para 5.3.2 states "*At sites where cable launching is permitted, cables may be carried up to heights of 2000 ft agl. At a few sites the heights of 2000 ft may be exceeded. ...*"

UK AIP ENR 5-5-1-5 promulgates Syerston as a Glider Launching Site "*By winch/ground Tow and tug/motor glider with vertical limits 3000ft agl and active sunrise to sunset.*"

UKAB Note (3): Analysis of available recorded radar data is inconclusive as the Viking glider is below radar cover throughout. Consequently, the reported encounter is not shown. However, the Claxby radar data recording reveals, at 1241:23, an SSR-only paint, code 4550 with no Mode C, 0-5nm to the S of the plotted Syerston ARP; this is the SSR code allocated to the C172 by the East Midlands Approach Radar controller. This continues on a SSW track consistent with the reports of the C172 pilot and East Midlands Approach Radar controller. The plotted track suggests that the C172 had previously flown directly overhead the promulgated glider-launching site and crossed the lateral limits of the Syerston ATZ. It also suggests that the reported encounter occurred just prior to the first paint at 1241:23.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac, radar video recording, and reports from the air traffic controller involved and the appropriate operating authority.

It was clear to members that a safety net, in the form of timely intervention by the duty instructor, had prevented a potentially dangerous situation, where not only had both ac been at risk of collision but the C172 had also been at risk of collision with the winch cable. It was evident from radar recording corroboration of the Viking pilot's report that the C172 pilot had flown through the promulgated glider site. Members were unanimous in the view that the C172 pilot had

AIRPROX REPORT No 171/02.

been most unwise to overfly such a long established and well-promulgated glider site. However, what remained unclear was whether the ground party had visually cleared the area above and behind the winch prior to launching the Viking. Furthermore, given that C172 pilot reported that he was flying at 2000ft (unspecified QNH) having departed from Gamston (elev 91ft) and that the C172 subsequently crossed the East Midlands CTA at 1800ft (East Midlands QNH), it was probable that the C172 pilot had infringed the Syerston ATZ, though probably higher than suggested by the Viking pilot. It was, in the opinion of the Board, penetration of the ATZ by the C172 pilot without obtaining information that caused him to fly into conflict with the glider. Although the Viking pilot's release from the launch cable removed actual risk of collision, minimum separation distance was the result of luck rather than judgement on behalf of either pilot. Hence,

some members argued, had the glider pilot's ROC been higher or the attention of the DI been elsewhere, the risk of collision would have been greater. However, the majority thought that the response of the Viking pilot to the radio warning had removed any risk of collision.

The Board acknowledged and welcomed the candour of the C172 pilot's report.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Penetration of the Syerston ATZ by the C172 pilot without obtaining information from the A/G radio station, and who then flew into conflict with a winch-launching glider that he did not see.

Degree of Risk: C

AIRPROX REPORT NO 171/02

Date/Time: 12 Sep 1654

Position: 5110N 0058W (2.7nm ESE of Lasham - elev 618ft)

Airspace: MATZ/FIR (Class: G)

Reporting Aircraft Reported Aircraft

Type: DR400 G4
+K21 Glider

Operator: Civ Club Civ Exec

Alt/FL: 3000ft↑ ↓2400ft
(QFE) (QNH 1023mb)

Weather VMC CLOC VMC CAVOK

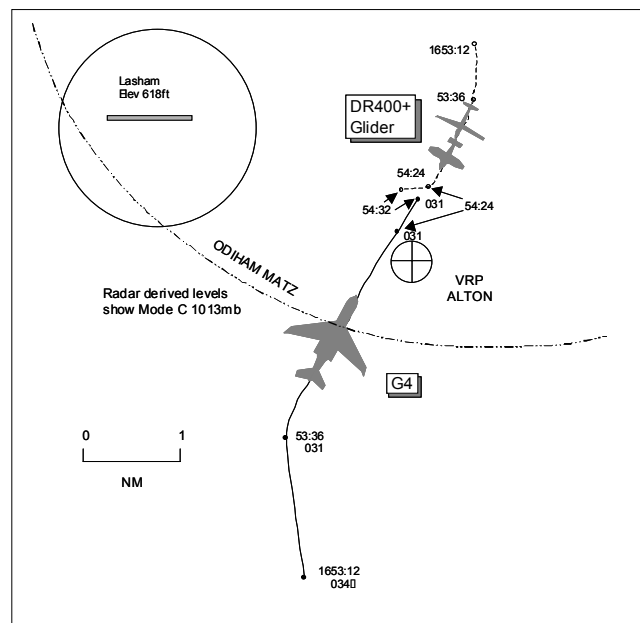
Visibility: >10km

Reported Separation:

100-200ft V 100-200ft V
300m H 300m H

Recorded Separation:

0.18nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE DR400 + (K21 GLIDER) PILOT reports heading 190° at 65kt climbing on an aerotow from Lasham and in receipt of an A/G service from Lasham RADIO on 131.02MHz. The visibility was >10km clear of cloud in VMC and the ac was

coloured orange/white. Strobe, taxi and landing lights were all switched on and neither TCAS nor a transponder was fitted to the ac. About 1.5nm from the eastern threshold of RW 27, she spotted an ac, the subject G4, in her 11 o'clock range 1-2

nm heading straight and level. Immediately she commenced a RH climbing turn to avoid, the G4 was seen to pass 100-200ft below and 300m to her L without deviating. She had reached 3000ft QFE and had rolled out on a westerly heading just after the G4 had passed and she assessed the risk of collision as high.

THE G4 PILOT reports heading 020° at 200kt inbound to Farnborough squawking an assigned code with Mode C and in receipt of a 'limited' RAS from Farnborough APPROACH. The weather was CAVOK and the ac was coloured white/green and his strobe lights were switched on. About 15-20nm SW of Farnborough when about to commence final approach under high workload at 2400ft QNH, he thought, he was advised by the controller of several targets but TCAS showed no altitude readouts. He spotted a low wing white tug ac 0.5nm away, flying straight and level, towing a white glider which was in a slight R turn. There was no time to increase lateral separation, the ac combination passed 200ft above and 300-400yd to his L. He believed there was no risk of collision owing to the subject acs' headings being maintained at the time. After passing the tug and glider he informed the APR that he must have given both pilots a 'fright'.

THE FARNBOROUGH APPROACH CONTROLLER reports working with a trainee at the time of the incident. The G4 was being vectored, using SSR only, for an ILS to RW 06 at Farnborough under a limited RAS as the primary radar was u/s. The airspace was busy at the time with known LARS traffic, the G4 was given a heading of N, when about 15nm SW of Farnborough, to keep it clear of one ac that was restricting the flight's descent profile. When the G4 pilot subsequently reported that he had passed close to a Glider and Tug, the trainee replied that the conflicting ac was not seen on radar and that he was working SSR only. The G4 continued his approach and effected a normal landing. Subsequently, Lasham telephoned stating that Airprox reporting action would be taken; the G4 crew were duly informed.

ATSI comments that the G4 was inbound to Farnborough and under the control of approach control who were operating with a mentor and a u/t controller. The primary radar at Farnborough was unserviceable but SSR was available. The G4 established communication with Farnborough

while descending to 4000ft. The controller issued a clearance for further descent (to 3400ft) and, when the ac left CAS, the crew was informed that they were under a RAS. No mention was made, as is required in JSP318A, that the service was limited owing to operating with SSR only. The controller then advised the G4 crew that the service was limited from the North '*...as you approach Odiham.*'. Further descent to 2400ft was given and shortly afterwards, the G4 pilot reported that he had passed a glider and tug. The controller then advised that they were not showing on radar as he was working SSR only. The G4 continued its approach and an Airprox was later filed by the gliding club. As a result of this incident, a Supplementary Instruction was issued by the ATS Manager at Farnborough informing ATCOs that the practice of using only SSR must cease.

UKAB Note (1): The RT transcript shortly before 1652:30 reveals that the Farnborough APR issued a radar heading of 360° as well as descent to 3400ft QNH in response to the G4 pilot's initial call on the frequency followed approx 1 min later by a further R turn onto 040°.

UKAB Note (2): The Farnborough QNH was 1023mb.

UKAB Note (3): The incident occurred within the Odiham MATZ where Farnborough are the controlling authority UK AIP ENR2-2-3-1 refers.

UKAB Note (4): The UK AIP at ENR 5-5-1-3 promulgates Lasham as a Glider Launching Site centred 511112N 0010155W for winch and aerotow launches where cables and tug ac may be encountered up to 3000ft agl, site elevation 618ft amsl, during daylight hours.

UKAB Note (5): The UK AIP AD 2-EGLF-1-10 Flight Procedures d) Procedures for Airways Flights to and from Farnborough para iv) Arrival Routes Note 2 states: *due to intense gliding activity pilots should avoid flying within 2.5nm of Lasham Aerodrome (511112N 0010155W) below 5000ft ALT. When available, Farnborough Radar will provide navigational assistance as necessary.* Para vii) Inbound Procedures (1) states: *After leaving airways, pilots will normally be provided with a radar service by Farnborough ATC during the operating hours of that unit.*

AIRPROX REPORT No 171/02.

UKAB Note (6): Analysis of the Heathrow radar recording at 1653:12 shows a primary only return, believed to be the DR400 tug and ASK21 glider combination, 3.25nm ENE of Lasham turning R through heading 170° with the G4 4.7nm SSE of Lasham squawking with Mode C, tracking 350° and descending through FL034 (3700ft Farnborough QNH 1023mb). 24 sec later the G4 commences a R turn whilst levelling off at FL031 (3400ft QNH) 3.9nm SSW of the tug/glider combination who are steady on a 210° track. After the G4 steadies on a 030° track 8 sec later maintaining FL031 (3400ft QNH), the subject ac converge head-on until, at 1654:24, the tug and glider turn R in the G4's 12 o'clock range 0.57nm. CPA occurs 8 sec later at 1654:32 as the tug and glider passes through the G4's 9 o'clock range 0.18nm (325m) on a track of 260°. The G4 indicates FL031 (3400ft QNH) for one further radar sweep before commencing descent. The DR400 pilot reported that she had reached 3000ft Lasham QFE (3618ft QNH) as the subject ac passed.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members were surprised that there were no apparent restrictions placed on the gliding operation from Lasham in terms of operating in the Odiham MATZ. Moreover, the encounter highlighted the sort of problems that arise with arrangements involving the provision/receipt of a radar service using SSR only within Class G airspace and its associated unknown traffic environment. The non-squawking DR400 tug and glider combination would not have shown on the Farnborough APR's radar display and the pilots were 'incommunicado' whilst climbing within the Odiham MATZ and therefore were unknown to the ATCO. Ultimately, the G4 crew were responsible for their own separation from other traffic after leaving CAS flying under IFR using the 'see and avoid' principle. However, they may have been lulled into a false sense of security with the provision of a RAS. During the 'level of service'

contract agreement phase, the ATCO should have informed the G4 crew that the radar service was limited and spelt out why. A succinct warning from the APR that he could only see transponding ac could have heightened the 'situational awareness' within the G4 cockpit, particularly as their intended flight path was known to pass close to Lasham. This 'missing element' may have allowed the crew visually to acquire the tug/glider combination earlier and was thought by members to have contributed to the Airprox. In the absence of the ATC 'safety net', the detection and resolution of the incident had rested with the pilots, who were going about their respective business, commensurate with the airspace requirements. The G4 crew had routed >2.5nm clear of Lasham, in compliance with the recommendation in the UK AIP, during the intermediate approach phase. They had seen the tug/glider combination late, which was understandable owing to the almost head-on aspect; with no time to increase separation they could only watch it pass 200ft above and 300-400yd clear to their L as they descended into the Odiham MATZ. The G4 pilot had been unaware that the DR400 combination had already commenced avoiding action. Meanwhile, the DR400 pilot had already spotted the G4 at range 1-2nm and, with limited manoeuvring options available, had elected to turn R and continue to climb taking her out of the MATZ in avoidance. The G4 was seen to pass 100-200ft below and 300m to the L. Although this action had singularly resolved the conflict by ensuring that the subject ac were not going to collide, change to the flight path had been achieved late leaving the subject ac to pass in close proximity to the extent that safety had not been assured during the critical period.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict on the upper limit of the Odiham MATZ resolved by the DR400 pilot.

Degree of Risk: B

Contributory Factor The Farnborough APR did not state that the RAS was limited or describe the limitation.

AIRPROX REPORT NO 172/02

Date/Time: 13 Sep 1244

Position: 5625N 0320W (2nm SE of Perth - elev 397 ft)

Airspace: Scottish FIR (Class: G)

Reporting Aircraft Reported Aircraft

Type: Dornier 328 Sea Harrier FA2

Operator: CAT HQ STC

Alt/FL: 2200ft 2000ft
(QNH 1032mb) (RPS 1027mb)

Weather VMC CLBC VMC HAZE

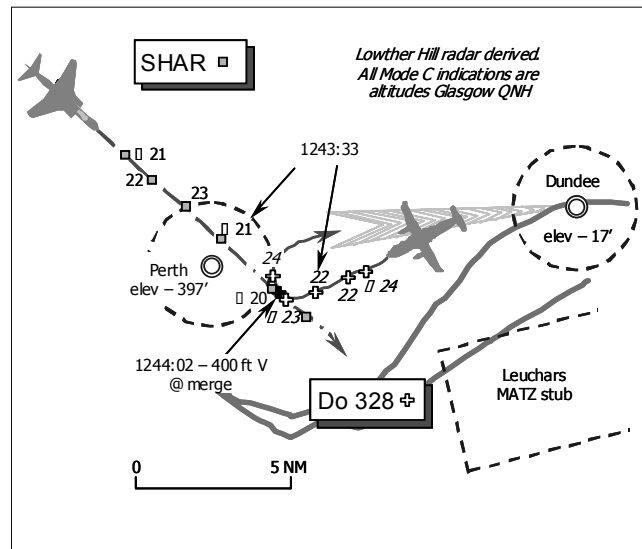
Visibility: >20km 10nm

Reported Separation:

400ft V, 200m H 500ft V, ½nm H

Recorded Separation:

400ftV @ merge

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

THE DORNIER 328 PILOT reports his ac has a white & red livery and the HISLs and landing light were on whilst inbound from London City to Dundee for an ILS/DME for RW10. A squawk of A7000 was selected with Mode C and he was under a Procedural Approach Service from Dundee on 122.90MHz; TCAS is fitted. Flying about 700ft below cloud at 140kt, 9nm W of the airport, turning R to intercept the LLZ at 2200ft Dundee QNH (1032mb), a TCAS 'CLIMB' RA was enunciated against another ac ahead at the same altitude, just as the other ac - a Sea Harrier - was spotted 1000ft ahead, heading S - he thought. A climbing R turn was initiated to avoid the jet, which passed 200m away down the port side about 400 ft below his ac with a "high" risk of a collision. ATC was advised of the RA and the conflict was 'resolved' as they passed through 2800ft amsl.

[UKAB Note 1: The Dundee weather was reported as surface wind: 110/8; 25km Nil Wx; FEW 1500ft; BKN 2000 ft; Temp: 16/14; QNH: 1032mb.]

THE SEA HARRIER FA2 (SHAR) PILOT reports that his ac has an air defence grey camouflage scheme; HISLs are not fitted. The appropriate squawk with Mode C was selected, but TCAS is not fitted.

He was inbound from Yeovilton to Leuchars VFR, and at the end of the low-level navigational phase of the sortie, climbed to 2000ft RPS (1027mb) at Dunkeld to set course for a point 10nm 'initials' for RW09, before calling Leuchars APPROACH on 255.4MHz for a radar-visual recovery. On initial contact with APP, he was assigned a squawk and he thought placed under a RIS, before being warned of traffic in his vicinity based on his reported position at the time. Heading 160°, flying straight and level at 360 kt, he spotted the Dornier in his 10 o'clock - 3nm away at the same altitude in a climbing R turn and assessed that the best avoiding action would be to descend 500ft below the other ac. He did so, informing APP that he was visual with the Dornier and also of his intentions. The Dornier passed ½ nm to port and 500ft above his jet - whilst it was still climbing and turning R - with a "low" risk of a collision.

THE DUNDEE COMBINED APPROACH(APC)/ AERODROME CONTROLLER reports that the Dornier was carrying out an ILS/DME procedure to RW10, IFR, in Class G airspace. During the procedure turn, whilst level at 2200ft Dundee QNH, the crew reported that a Harrier ac was seen head-on at the same altitude approaching from the N, heading S, which resulted in a TCAS RA. They said the SHAR passed down the port

AIRPROX REPORT No 172/02.

side of the Dornier about 200m away and 400ft below their ac.

UKAB Note (2): Before this Airprox occurred and whilst homing to the 'DND', the Dornier pilot reported to Dundee APC that a TCAS "alert" had occurred at 1241:30, on traffic about "...1nm to the south-east of us". When asked by the APC if he was "...going to file on that", the Dornier pilot advised "standby...", before reporting 20 sec later "...TCAS climbing there's a fast jet opposite direction our level", which was acknowledged by the APC.

MIL ATC OPS reports that the SHAR pilot free-called Leuchars RADAR (RAD) at 1242:43, and reported that he had "...pulled out of low-level 15 miles north-west" and requested a VISUAL join. A squawk of A0210 was assigned and the airfield details passed - RW09; colour code BLUE; QFE 1032, which was read back correctly by the SHAR pilot. The ac was not identified on radar at this point; it is SOP for visual Cct joins at Leuchars to be afforded a FIS only, though the ATS was not specified by RAD. At 1243:32, RAD passed traffic information to the SHAR pilot "...traffic believed to be you has traffic 12 o'clock 5 miles crossing left right indicating similar altitude", which the pilot acknowledged. This information was updated by RAD 10sec later "...now 12 o'clock 4 indicating 1700", whereupon the SHAR pilot reported "...tally a Hercules" [[UKAB Note (3): It was actually the subject Do328]. The pilot was then instructed to call Leuchars DIRECTOR (DIR).

[UKAB Note (4): The Leuchars SSR Mode C displayed to RAD would be set to 1013mb. Therefore, a level of 1700ft (1013mb) would equate to an altitude of about 2340ft QNH (1031mb)].

RAD reported that the "...SSR on the return was intermittent", consequently RAD was prudent in referring to this traffic as "...traffic believed to be you". The SHAR pilot should have called Leuchars on their ICF, so RAD acted promptly, demonstrating sound teamwork with DIR who was working quite hard controlling ac inbound for their annual air show.

THE SEA HARRIER PILOT'S UNIT comments that the SHAR pilot flew a high level transit from Yeovilton to Arran, thereafter letting down into the UKDLFS to transit W to E across Scotland to

Dunkeld (10nm NNW of Perth). At Dunkeld he commenced a slow climb out from the LFS and freecalled RAD at the pre-notified time he was required to call for recovery. He acquired the Dornier on his ac's AI radar first, then spotted it visually at a range of 3nm and assessed the ac was climbing in the right hand turn away from him. Whereupon, he opted to descend 500ft to pass beneath the ac and about ½nm away. At no time did he consider that there had been a risk of collision.

UKAB Note (5): The ScATCC (Mil) Lowther Hill radar recording illustrates this Airprox clearly, which displays Mode C as an altitude based on the Glasgow QNH (1031mb) below the transition altitude [6000ft in the Scottish TMA] throughout its coverage. The SHAR is shown pulling up from Dunkeld, as reported, on a south-easterly track to a maximum altitude of 2300ft Glasgow QNH (1031mb), as the Do328 descends to 2200ft Glasgow QNH downwind for the ILS to RW10 at Dundee. The SHAR is shown descending through 2100ft ALT at 1243:33, within the Perth ATZ, at the same time as RAD passed traffic information on the Do328, which is still shown level at 2200ft ALT. The ac converge; just before the contacts merge in azimuth, the Do328 Mode C indicates a climb through 2300ft ALT in conformity with the reported TCAS RA and R turn, as the SHAR descends through 2000ft ALT. The contacts merge at 1244:02, marginally SE of the Perth ATZ boundary, when 400 ft vertical separation is evident between the SHAR – at 2000ft ALT and the Do328 – shown climbing through 2400ft ALT.

HQ STC comments that the SHAR's AI Radar is this ac's best form of a CWS. The SHAR pilot's decision to call Leuchars RAD some 15nm NW of Leuchars was somewhat tardy, [UKAB Note (6): The RAF FLIP En Route Supplement-BINA entry for Leuchars, requires crews to call at 40nm range.] and shows his lack of awareness of the proximity of both Perth aerodrome and Dundee's RW10 instrument approach (that is clearly marked on the 1:500,000 LFC). He should have routed W of Perth or significantly higher than his ATZ-adjacent altitude thus giving himself freedom to manoeuvre more than his chosen 500ft avoiding action descent.

The recorded separation of 400ft was achieved by the SHAR pilot via his early detection of the

Dornier. Whilst there was no risk of collision between the 2 ac, the SHAR flew significantly close enough to concern the crew of the Dornier. There is no indication that the SHAR was on a minimum fuel approach to Leuchars and thus should have been more considerate to the Dornier's safety bubble.

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.

CAT pilot members sympathised with the Do328 crew's situation and there was considerable debate over conducting IFR approaches to aerodromes situated in class G airspace. The only method of separation in the 'open FIR', between IFR traffic under a procedural ATS from a non-radar equipped ATSU and VFR traffic, was 'see and avoid'. So, in the Board's view, though the Do328 crew was conducting an IFR procedure, they were no less responsible in VMC for looking out for other traffic. This point was not a criticism of the Do328 crew in any way, rather just one of the aspects to consider when conducting IFR approaches in Class G airspace. Indeed, the benefits of TCAS had once again been demonstrated by the warning given to the Do328 crew as they turned adjacent to the Perth ATZ boundary toward the LLZ. With the SHAR heading directly toward their ac at a combined closing speed in the order of 500kt, it was fortunate that the TCAS RA facilitated their avoiding action climb and also helped them to spot the approaching jet. Moreover, it appeared to members that the VFR SHAR pilot had seen the Do328 after its crew had reacted to the RA and started their climb.

Military pilot members were critical, however, of the SHAR pilot's chosen routeing from climbout at Dunkeld to Leuchars. This route, though direct to 10nm 'INITIALS' for RW09, took him through the top of the Perth ATZ at his chosen transit altitude and it was too close to the Dundee RW10 instrument approach centreline which was clearly marked on the military LFC. Routeing around Perth to the W or flying at a higher altitude through

less confined airspace were better alternatives especially with the likelihood of increased traffic in the vicinity as a result of the Leuchars airshow. However, whilst inbound for his VISUAL approach [not RADAR-VISUAL as the SHAR pilot thought and before being placed under an ATS by Leuchars] the alert RADAR controller provided pertinent traffic information on the Do328 soon after being called. The Board commended the controller for this astutely provided traffic information, which helped the SHAR pilot to spot the other ac at a range of 3nm and take avoiding action. It was unfortunate that the latter took him further into the Perth ATZ. Some members thought that the SHAR pilot's flight through the Dundee instrument pattern was part of the cause of this Airprox. Whilst the Do328 was certainly turning toward the LLZ on the procedure under IFR it was not on final approach and, repeating the point made earlier, enjoyed no special 'protection' from VFR traffic. So whilst the SHAR pilot may have been unwise to choose the route that he did, he was nonetheless legitimately entitled to do so but outwith the Perth ATZ. That said, members thought that although penetration of an ATZ was preferable to eroding still further safe separation, the SHAR pilot should not have put himself in this position. The combination of the Do328's climb and the jet's descent however, had resulted in 400ft separation. All the required safety nets had worked to prevent the situation from becoming more serious and members concluded, therefore, that this Airprox had occurred because the SHAR FA2 pilot flew close enough to cause concern to the Do328 crew.

Turning to risk, this had not been an entirely comfortable situation for those concerned, but TCAS had alerted the Do328 crew, who whilst complying with the RA, had spotted the jet. From the other cockpit the SHAR pilot had also been alerted by RAD, detected the airliner on his AI radar and then saw it in time to avoid it. The Board concluded that the sum of all these actions had in the end safely removed any risk of a collision.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The SHAR FA2 pilot flew close enough to cause concern to the Do328 crew.

Degree of Risk: C.

AIRPROX REPORT No 173/02.

AIRPROX REPORT NO 173/02

Date/Time: 13 Sep 1831

Position: 5142N 00120W (1.5nm NW
Abingdon Airfield - Elev 261ft)

Airspace: Oxford AIAA (Class: G)

Reporting Aircraft Reported Aircraft

Type: AS355 C303

Operator: Civ Comm Civ Pte

Alt/FL: 1000ft ↑3500ft
(RPS 1021mb)

Weather VMC CAVOK VMC CAVOK

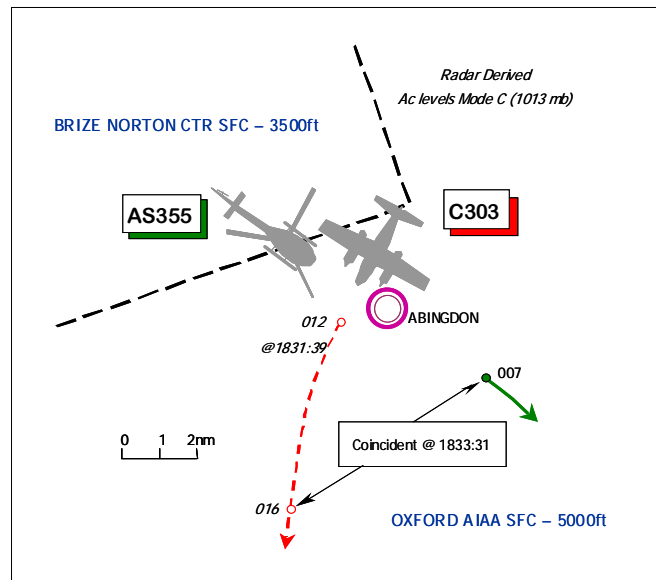
Visibility: 20km >20km

Reported Separation:

50ft V, 50m H Not Reported

Recorded Separation:

NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE AS355 PILOT reports that his ac was in a blue and yellow high conspicuity paint scheme and that all anti-collision, strobe and position lights were selected on. Whilst in transit from the Brize Norton Zone to RAF Benson at 1000ft (Cotswold RPS 1021mb), at 110kt and hdg 130°, a fixed-wing ac at a similar height was seen very late, approaching from the 9 to 10 o'clock position at a range of between 100 and 200yd, having been obscured by the helicopter's roof and cockpit pillar. The ac, which was flying straight and level, was a low-wing, twin-engine Cessna with retracted undercarriage coloured cream with tan flash lines. There was only sufficient time to make a slight descent before the other ac flew across the nose about 50m ahead and 50 to 70ft above. There was no apparent deviation from the other ac. He assessed that risk of collision had been very high. The registration of the other ac was clearly distinguishable and this was passed to Brize Radar as part of the initial report. The other ac, which was hdg generally SW, was possibly out of Oxford/Kidlington and, he thought, may have been avoiding the Brize Zone to the E. It was not in contact with Brize Zone. He adds that although the see and avoid principle pertains in the open FIR, nevertheless in such an area of intense air

activity where the encounter had occurred, the pilot of the fixed-wing ac should be aware of the benefits of contacting Brize/Benson.

THE C303 PILOT reports that he was flying solo en route from Oxford to Thruxton in good VMC and climbing to 3500ft. A helicopter was seen at 3nm and ROC increased to avoid. There was no risk of collision. He adds that his ac was coloured cream and that he was squawking SSR Mode A code 7000 with Mode C.

MIL ATC OPS reports that the AS355 pilot called Brize Norton Radar (ZONE) controller on 134.3MHz at 1744:42 on departure from Benson and requested a Zone transit at 1000ft. The ac was placed under a FIS, SSR Mode 3/A code 7300 allocated and the Cotswold RPS (1021mb) was passed. The AS355 continued to a task just N of the Brize Norton CTR, remaining on 134.3MHz and then returned through the Zone again at 1000ft. At the time of the reported incident only the AS355 was on frequency. Just after clearing the CTR, at 1831:36, the AS355 pilot reported "I've just been overflown by a twin fixed-wing, roughly southerly direction, could have only passed about 100ft overhead. Looked to be

(C303 registration)". ZONE acknowledged the report and advised the AS355 pilot that the reported ac was not working Brize Norton.

In his written report ZONE states that at the time of the incident he had temporarily vacated the console to undertake some routine administrative tasks. However, the frequency was selected on loudspeaker and monitored continuously. Moreover, the Unit reports that prior to vacating his console the conflicting traffic was not painting on radar. It should be noted that FIS is a non-radar service, under which iaw JSP318A Reg 235.125.1, the controller is not responsible for provision of separation.

UKAB Note (1): The reported incident occurred within the Oxford AIAA.

UK AIP ENR 1.1.5 para 2.2.1 states: "*Intense civil and/or military air activity takes place within the areas listed in ENR 5.2. Pilots of non-participating aircraft who are unable to avoid AIAs are to keep a good lookout and are strongly advised to make use of radar services if available: ...*"

UK AIP ENR 5.2 promulgates the lateral limits of the Oxford AIAA, its vertical limits as SFC to 5000ft ALT and hours of activity as being permanent. It also states: "*Radar services are available within this area from Brize Norton ATC on 134.300MHz.*"

UKAB Note (2): Analysis of available radar data recordings is inconclusive, as the incident is not seen. However, the data recording from the Heathrow 23cm radar reveals that at 1831:39 a Mode A SSR code 7000 return is 1.3nm WSW of Abingdon tracking SSW and displaying 012 on Mode C. This return is believed to be the C303. 1200ft on 1013mb equates to approximately 1440ft on the Cotswold RPS (1021mb). At 1833:31 the AS355 paints 3.2nm SE of Abingdon, tracking SE, squawking SSR Mode A code 7300 and with Mode C displaying 007, which equates to approximately 940ft on the Cotswold RPS (1021mb).

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac, transcript of the relevant RT

frequency, radar video recording, and reports from the air traffic controller involved and the appropriate ATC authority.

Members noted the marked disparity in the pilots' reports. Whereas the AS355 pilot stated short separation distances, the C303 pilot stated that he had seen the helicopter from 3nm although he did not provide minimum separation distances. Members thought those given by the AS355 pilot were probable, since the C303 registration was correctly distinguished and reported at the time. Moreover, although the radar recording did not show the encounter itself, it did show that the C303 was, shortly after the event, 500ft above the reported altitude of AS355. Hence if the C303 pilot had maintained a climb throughout the encounter, as reported, then vertical separation at CPA must have been less <500ft, even though onus was upon the C303 pilot to give way to the helicopter.

Members inferred from this 3 possibilities, after discounting the possibility that the C303 pilot had deliberately flown too close to the AS355. These were:

The C303 pilot had seen another helicopter and not the subject AS355;

That the C303 pilot had seen the subject AS355, misjudged its altitude and as a result had flown quite close; or

The C303 pilot had seen the AS355 at 3nm, but subsequently lost sight of it and had misjudged his avoiding action.

Lending weight to the last, a GA pilot member suggested that since the C303 pilot was flying solo, if the geometry of the conflict was as suggested by the diagram, then the pilot probably would have been unsighted as the AS355 approached from his R. Furthermore, members noted, the C303 pilot would have been looking into sun. Whatever the case, the Board were agreed that the action taken by the C303 pilot was inadequate.

But the Board was divided as to the degree of risk. Some members thought that notwithstanding the radar data recording, the separation distances remained uncorroborated and therefore should not be given too much credence. The majority,

AIRPROX REPORT No 174/02.

however, were persuaded by the radar data together with the report by the AS355 pilot of his late and, they thought, probably ineffectual avoiding action. Accordingly, they assessed that safety of the AS355 had been compromised.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Insufficient avoiding action by the C303 pilot, causing concern to the AS355 pilot who saw the C303 late.

Degree of Risk: B

AIRPROX REPORT NO 174/02

Date/Time: 11 Sep 1338

Position: 5148N 0118W (2nm S of Oxford Airport - elev 270ft)

Airspace: ATZ (Class: G)

Reporting Aircraft Reported Aircraft

Type: PA34 PA28R

Operator: Civ Trg Civ Pte

Alt/FL: 1200ft↓ 1500ft
(QNH 1027mb) (QNH 1027mb)

Weather VMC CAVOK VMC HZNC

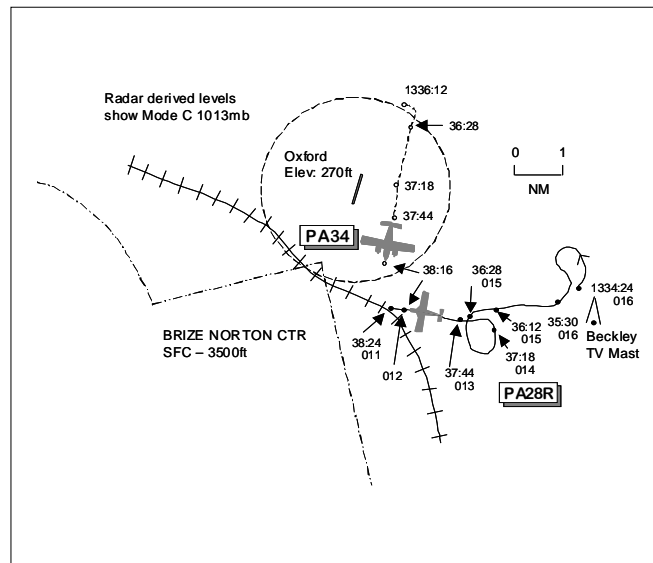
Visibility: 30km 6km

Reported Separation:

0ft V 50-100yd H 50ft V 150-200m H

Recorded Separation:

not recorded



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE PA34 PILOT reports flying a local dual instructional training sortie from Oxford and in receipt of an ATS from Oxford TOWER on 133.42MHz. The visibility was 30km in CAVOK and the ac was coloured white with brown/blue stripes. The transponder was selected to standby and his strobe lights were switched on. Having called downwind for RW01 RH heading 190° at 100kt for a practice asymmetric touch and go and being given "number one call finals", he heard a general broadcast from the ADC concerning a single engine ac, he thought, joining RB at range 6nm. He spent some time checking the area from which the other ac was likely to be approaching but he anticipated that he would be well clear - no calls were heard from the joining ac. The student reached the end of the DW leg in a slight descent and applied bank to the R to turn towards final. At

this point descending through 1200ft QNH 1027mb, the PA28R was seen in his 1130 position range 50-100yd at the same level, descending wings level L to R; it appeared to be following the railway line that delineates the end of the DW leg. There was no time to take avoiding action as the PA28R 'flashed across his nose'. He informed ATC that he would be filing an Airprox. The ADC told the PA28R pilot to go around, its pilot's calls were clear and confident and he appeared not to be aware that anything was amiss. Cockpit workload had been high at the time of the incident, with his shock being more of 'where did he come from' rather than a very near miss; his student also expressed his shock forcibly at the time. He assessed the risk as "high if the other pilot had not seen him or medium if he had".

THE PA28R ARROW PILOT reports heading 270° at 110kt and 1500ft QNH 1027mb inbound to Oxford from Fair Oaks and in receipt of an ATS from Oxford TOWER on 133.42MHz squawking 7000 with Mode C. The visibility was 6km in VMC and the ac was coloured white with a red stripe. Initially he had been held at Beckley Mast before being cleared for a RB join number 1 for RW01. The ADC issued a late warning of another ac that was late DW, which he acquired visually to his R about 300-400m away. At first he only saw its landing light as it was 'tight in' to the RW and it had merged into the background of Kidlington village just over its western edge. He maintained his course as he judged that the other ac would pass behind. The other ac was seen to pass 150-200m clear to his R and behind and 50ft below and he assessed the risk of collision as very low.

THE OXFORD APP reports that during a busy period the PA28R pilot requested to join the cct RB for RW01. Owing to a busy cct, he instructed the PA28R to hold-off to the E whilst he co-ordinated with the ADC, the Arrow pilot had then reported holding at Beckley TV Mast. A short delay ensued whilst he co-ordinated further traffic, an inbound HS25 from Luton, which was also positioning for a RB join. After the ADC approved the join by the PA28R, he instructed its pilot to join RB and issued TI on the HS25 joining behind him and on a PA34 which was late DW in the visual cct. This was acknowledged and the ac was transferred to Tower.

THE OXFORD ADC reports that the PA34 was carrying out ccts on RW 01 RH and the PA28R was awaiting a RB join on the APP frequency holding at Beckley Mast. He was very busy at the time. When the PA34 called DW, he told the APP to give RB joining clearance to the PA28R. Believing that the Arrow was holding 6nm away, by the time the APP had given the PA28R pilot joining instructions it did not warrant passing of TI to the PA34. When the Arrow pilot made his first call on the TOWER frequency on RB, the PA34 was also positioning onto RB in conflict. Immediately he told the PA28R to position No2 to the Seneca at which time the PA34 pilot reported an Airprox. He believed that the PA28R had not been holding-off at Beckley Mast.

ATSI reports that the Oxford APP told the PA28R to hold off initially to the E as he thought it would be behind another ac, an HS25 which was joining

from the E. No specific location was mentioned as to where it should hold. The PA28R pilot, subsequently at 1335:40, reported by the Beckley Mast (6nm Oxford Airport). It would appear that ATC thought the PA28R was holding in that position so had based their actions accordingly.

Only 50 sec elapsed between the Arrow pilot being cleared to join RB (on the APP frequency) and, following transfer to TWR, then reporting RB. The pilot was informed about the PA34, late DW but did not read back the information (this is not on the list of required messages to be read back-MATS Part 1, Appendix E, Page 8). As soon as 2-way communications were established with TWR he was asked if he had the PA34 in sight. Although part simultaneous transmissions were received it would appear that he did report visual, whereupon he was instructed to go around.

Meanwhile, the PA34 had been cleared to report final number 1 by the TWR. No TI was passed concerning the PA28R as the controller believed it was still some distance away (based on holding at Beckley Mast) although the pilot reported hearing a general broadcast about traffic joining right base.

UKAB Note (1): The Oxford 1250 METAR 04005KT CAVOK 20/06 1027=

UKAB Note (2): The ADC RT transcript at 1334:30 shows the ADC broadcasting "*Oxford Tower H S two five joining at about ten miles for a right base join from the east Oxford Tower out*". The HS25 calls at 1337:10 at range 15nm joining RB to which the ADC requests a report when at 4nm and gives TI on the subject PA34 traffic in the cct.

UKAB Note (3): The RT transcript for Oxford APP reveals the PA28R pilot establishing communications at 1328:40 and after requesting joining instructions is told to standby. Nearly two min later, the APP transmits "*PA28R c/s the circuit is very busy at the moment hold off to the east I'll call you in shortly*" which was acknowledged. Two and a half min later (1333:10) the PA28R calls "*... we're good visual with Oxford we could fit in the right base for zero one if you could fit us in*" to which the APP replies "*Roger I'll try and co-ordinate with Tower just hold off for the moment*". After 30 sec the HS25 calls inbound 26nm to the E working Luton and is given TI on the subject

AIRPROX REPORT No 174/02.

PA28R holding to the E and RB joining clearance; subsequently (1334:45) the HS25 is transferred to TWR. At 1335:00 the Arrow is passed abbreviated TI on the HS25 joining from the E (no range element) and ends with the APP saying *"..../ hope to get you in behind that"*. Shortly thereafter, in response to the APP's request to report when he had the HS25 in sight, the Arrow pilot transmits *"Looking er PA28R c/s we're just by the Beckley Mast at the moment"*. One min later (1336:30) the PA28R pilot requests a position update on the HS25 and is told that the latest information given was 12nm to run so *"he should be on right base now we don't have him in sight"*; the Arrow pilot responds *"it'll be a long time yet"*. Finally, at 1337:30, the APP gives the PA28R pilot RB joining clearance but there is no mention of being "Number 1". The Arrow pilot replies *".....er we have a helicopter er right at the moment and er we're just about right base now"*. The APP responds (1337:40) *"Roger I'm visual with the helicopter he's not working me I'm afraid traffic is Seneca late downwind and the H S one two five is currently behind you about fifteen miles to run"*. The PA28R pilot replies *"er PA28 c/s that's what I thought"* and is subsequently transferred to TWR shortly before 1338:00.

UKAB Note (4): The UK AIP AD2-EGTK-1-4 states the Oxford cct height is 1200ft QFE (1450ftQNH).

UKAB Note (5): Analysis of the Clee Hill radar recording proved inconclusive, showing only the events leading up to the Airprox. At 1330 the PA28R is seen passing the Beckley TV Mast squawking 7000 indicating FL018 (2220ft QNH 1027mb) tracking 280° towards Oxford. One min later, the PA28R is seen to enter a R turn 1.5nm NW of the Mast and carry out two complete orbits. After completing a further 180° turn whilst in a gradual descent, at 1334:24 the PA28R reverses the turn (diagram starts) and completes one LH orbit indicating FL016 (2020ft QNH). Following this orbit, the Arrow then again reverses the turn and turns R onto a westerly track. A primary only return appears at 1336:12 2nm NNE of Oxford, the PA34, tracking SE crosswind with the PA28R still tracking W and indicating FL015 (1920ft QNH). 16 sec later, when the PA34 has steadied on a DW heading, the PA28R is seen to enter a LH orbit 4nm SE of Oxford. The PA34 fades from radar at 1337:44 1nm SE of Oxford with the

PA28R tracking 280° in its 1030 position range 2.6nm indicating FL013 (1720ft QNH). Only one further pop-up paint is seen on the PA34 at 1338:16 1.85nm SSE of Oxford by which time the Arrow is its 11 o'clock range 1nm indicating FL012 (1620ft QNH). The Arrow fades 8 sec later 2.7nm SSE of Oxford tracking 280° on an extended RB position indicating FL011 (1540ft 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 initially focused on the ATC aspects of this incident. The Oxford APP had told the PA28R pilot to hold off to the E whilst co-ordinating its joining clearance. In the absence of radar, ATCOs were reliant on accurate position reports from pilots in order to build their mental picture of the traffic situation to enable them to establish an orderly flow of traffic. The APP had erroneously assumed that the PA28R had been holding at Beckley Mast when its pilot reported *"by the mast"* but had neither confirmed this nor told the pilot to continue holding at a specific location or range from the aerodrome. Instead he had formulated a plan to sequence the Arrow behind the joining HS25, a plan which he later changed when the HS25 called on the TOWER frequency with an updated range. This last piece of information had persuaded APP that there was now 'room' to get the Arrow in ahead. Meanwhile the ADC had told the PA34 pilot that he was No 1 in the cct, believing the PA28R was safely positioned to join as No2 on RB, without the need to pass TI. When APP gave TI to the PA28R pilot on the PA34 *"late downwind"*, just before transferring him to the TOWER frequency, it was done in the expectation that plenty of separation (time) existed for the ADC subsequently to sequence the Arrow behind the PA34 as No2. However, the PA28R had then surprised ATC by arriving on RB in conflict with the PA34. At that point it became clear to both controllers that their earlier assumptions had been wrong, a situation that exposed a lack of positive control and members believed this had contributed to the Airprox.

The cockpit views of the incident were different. The PA34 had been given No1 in the cct when he called DW and had been looking for traffic joining RB, but believing he would be well ahead of it. At about the same time the PA28R pilot, who had been holding off for several minutes, had moved closer to position himself 4nm SE of the airfield in an orbit. When the clearance was given to join RB, he was rolling out of a turn and found himself already in that position. This left little or no time to integrate into the visual cct. Despite thinking he was cleared in as No1, this was not substantiated by the RT transcript, which revealed only the TI given to him about the PA34. By self-positioning so close to the circuit, the Arrow pilot had mistakenly denied himself time to acquire traffic already established in the pattern and had also denied the ADC time to provide him with a joining sequence number. These elements combined quickly to render difficult a safe entry into the visual cct and had led the PA28R pilot finally to cause the Airprox.

Looking at the risk involved, the Arrow took the Seneca pilot by surprise as it quickly crossed 50-

100yd ahead of him at the same level. For his part, the Arrow pilot saw the Seneca's landing light late, out to his R (300-400m away), with little time to act. Even so he judged that he would pass ahead of it, which he did by 150-200m and 50ft above. From these accounts it was clear that the subject ac were not going to collide, but both ac had arrived in the same part of the cct in conflict, which persuaded members that safety had not been assured.

PART C: ASSESSMENT OF CAUSE AND RISK

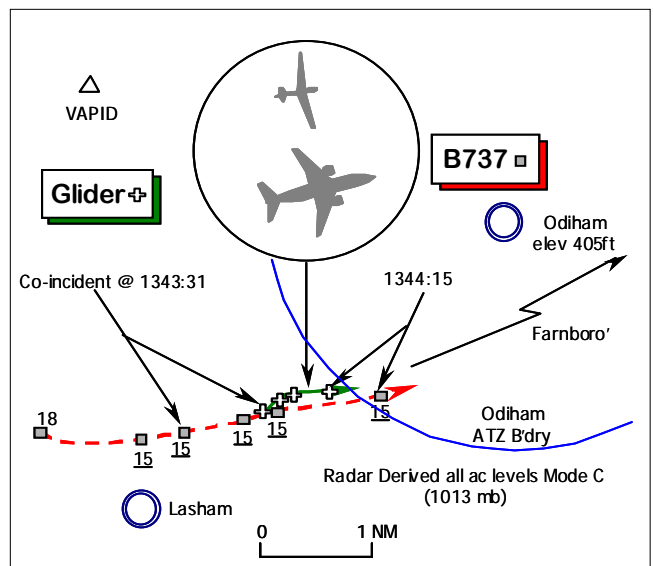
Cause: The PA28R pilot did not integrate safely into the visual cct.

Degree of Risk: B

Contributory Factors: Lack of positive control from Oxford ATC who did not establish with the PA28R pilot a holding position or give him joining sequence instructions.

AIRPROX REPORT NO 175/02

Date/Time: 14 Sep 1344 (Saturday)
Position: 5112N 0100W (1¾nm NE of Lasham A/F - elev 618ft ft)
Airspace: London FIR (Class: G)
Reporting Aircraft Reported Aircraft
Type: Grob 103 Glider B737-800
Operator: Civ Club Civ Comm
Alt/FL: 2000ft 1900ft
(Lasham QFE) (QNH 1027mb)
Weather VMC VMC
Visibility: 6-8Km Haze 9Km
Reported Separation:
300ft V, 300m H Not seen
Recorded Separation:
Not recorded



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE GROB 103 GLIDER PILOT reports his glider has a white colour scheme and he was in

communication with Lasham on 131.25MHz. Heading 090° at 55kt, he had just been released

AIRPROX REPORT No 175/02.

from his aerotow at 2500ft and was flying parallel to the main runway - 09/27 – about ½ km N of Lasham at 2000 ft aal. A B737 then overtook his glider 300m away to starboard and 300ft beneath his glider, descending on an approach into Farnborough. No avoiding action was taken as the airliner passed quickly underneath. Although he did not specify the degree of 'Risk', he opined it was *"too close for comfort"*.

THE B737-800 CAPTAIN, the Chief pilot, reports his airliner has a white colour scheme with blue stripes; the anti-collision beacon, HISLs, and landing lamps were all on whilst inbound from Newcastle to Farnborough under IFR. He was in receipt of a RAS from Farnborough APPROACH on 134.35MHz - but the primary SRE was unserviceable; the assigned squawk was selected with Mode C; TCAS is fitted. The glider flown by the reporting pilot was not seen at all.

He believes this airport demands more workload on his crews below 6000ft than any other European airport they operate into - more so when the weather is good/and on weekends as here – when there is obviously a marked increase in general aviation traffic on CAVOK days. He suggested that turbojet operators would like to have a mandated speed restriction of about 160-180kt when below 6000ft on descent and climb, to enable crews to have more time to look out of the cockpit as well as to reduce TCAS events. He added that crews do have concerns when operating into Farnborough and they would like to see, if possible, some sort of protective airspace around the airport with published SIDs and STARs. As Farnborough is getting busier and expanding he definitely believes that some additional safety nets are required.

THE FARNBOROUGH APPROACH RADAR CONTROLLER (APR) reports that he was monitoring a trainee in the APR position as an OJTI. The B737 was vectored under IFR N of Lasham for a 7½nm 'FINAL' to Farnborough RW06, for a visual approach from 1900ft Farnborough QNH (1027mb), *"within the busy constraints of a Saturday pm local traffic scenario"*. The Watchman primary SRE was unserviceable and only SSR was available.

ATSI reports that the inbound B737 was transferred to the Farnborough APR frequency. The controller was operating with SSR only. The

B737 crew was advised that it was a limited RAS as primary radar was not available and vectored for a visual approach to RW06 at Farnborough. Traffic information was passed during the approach [apparently on unrelated transponding traffic] and the crew was advised to keep a good look out for gliders as they passed Lasham.

Following this Airprox, this ATSU has stopped operating in this manner when primary radar is not available. Inbound traffic will be vectored for a 3-4nm 'FINAL' for RW06 or for an ILS RW24.

UKAB Note (1): The Farnborough QNH was 1027mb.

UKAB Note (2): The Odiham MATZ was closed; the ATZ is active H24.

UKAB Note (3): The UK AIP at ENR 5-5-1-3 promulgates Lasham as a Glider Launching Site centred on 51°11'12N 001°01'55W for winch and aerotow launches, where cables and tug ac may be encountered up to 3000ft above the aerodrome elevation of 618ft amsl, during daylight hours. Lasham does not have an ATZ.

UKAB Note (4): The UK AIP at ENR 5-5-1-5 promulgates Odiham as a Glider Launching Site centred on 51°14'03N 000°56'34W for winch and aerotow launches, where cables and tug ac may be encountered up to 2500ft above the aerodrome elevation of 405ft amsl, during daylight hours.

UKAB Note (5): The UK AIP AD 2-EGLF-1-10 Flight Procedures d) Procedures for Airways Flights to and from Farnborough para iv) Arrival Routes Note 2 states: *due to intense gliding activity pilots should avoid flying within 2.5nm of Lasham Aerodrome (511112N 0010155W) below 5000ft ALT. When available, Farnborough Radar will provide navigational assistance as necessary. Para vii) Inbound Procedures (1) states: After leaving airways, pilots will normally be provided with a radar service by Farnborough ATC during the operating hours of that unit.*

UKAB Note (6): The Glider pilot reports that this Airprox occurred ½km N of Lasham, but no primary contacts which could be associated with his glider are shown as the B737 passes 0.7nm N abeam Lasham. A primary contact, which may or may not be the reporting pilot's glider, is shown for the first time on the LATCC (Mil) Heathrow radar

recording at 1343:31, 1½nm NE of Lasham tracking slowly eastbound as the B737 approaches from astern indicating level at 1500ft Mode C (1013mb); this equates to an altitude of about 1920ft Farnborough QNH (1027mb) – about 1300ft above Lasham’s elevation and thus in the order of 700ft below the glider pilot’s reported height of 2000ft. This primary return is lost several sweeps later at 1343:50, but is not shown again until 1344:15, after it has been overtaken by the B737 and about 250m to the S of the primary return’s estimated track during the period.

UKAB Note (7): A review of the Farnborough RT transcript reveals that just before 1341:00, the B737 crew was placed under a “...*limited radar advisory service traffic information and avoiding action on transponding aircraft only and further limited due to...traffic density possible late warning on traffic standard separation [5nm] may not be achieved*”. The B737 crew acknowledged with “*okay understood[C/S]*”. Following descent to ALT 1900ft traffic information was passed on transponding traffic that was perceived by the APR to be a motorised glider. The APR requested the B737 crew to keep “...*a good rate of descent..*” and just before 1342:30, turned the ac L onto 060° entreating the crew to “*good rate of turn please to keep you north of Lasham*”, which was acknowledged. Further advice was passed “...*keep a good lookout for gliders in the vicinity of Lasham they’re not showing on radar*”, whereupon the B737 crew responded that they had “*four sets of eyeballs up here*”. Further traffic information was passed on “...*traffic in your 10 o’clock range of...3 miles manoeuvring...*”, which was not apparently the subject glider, followed by a L turn onto 060° at 1344:00. The APR then advised that the “...*previously called traffic is in your half past eight range of a mile and a half believed to be a glider in the Odiham circuit*”, whereupon the B737 crew reported the airport in sight and switched to TOWER.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board noted the B737 pilot’s concerns about maximum speeds whilst marshalling for an approach at Farnborough. CAT pilot members saw no reason why pilots could not reduce their ac’s speed themselves - to whatever they considered to be a safe compromise - that would enable them to manoeuvre their ac with safety, provided they told ATC what they were doing.

A member who is a keen glider pilot explained that the frequency of glider launches from the very busy site at Lasham could achieve a launch rate in excess of 100 gliders/hour at peak periods. Thus the airspace around Lasham can become very crowded with many gliders, very few of which – probably only motor-glanders – might be fitted with any form of SSR transponder that might make them visible to Farnborough ATC when operating without primary radar as here. The difficulties of detecting gliders on primary radar itself were well known and members were reassured that Farnborough ATC had elected to refrain from vectoring traffic on SSR only when their primary radar was not available. Some members were still concerned that ATC was vectoring traffic through the Odiham ATZ (which is H24) and close to the aerodrome below the maximum height that the winch cable can potentially attain. Gliding by several clubs takes place there. The Mil ATC Ops advisor explained that an agreement existed between Farnborough and Odiham to allow this to take place under specified conditions; the Board was also briefed that a dialogue had opened between the two units.

The RAS provided to the B737 crew could only provide a warning of traffic that was transponding on SSR. That limitation had been very clearly ‘spelt out’ by APR to the B737 crew, who had acknowledged that they understood the situation. Some members questioned the benefit of the ‘limited’ RAS and one thought it had no positive effect here at all. However, some controller members were critical of the APR vectoring the B737 so close to Lasham when the AIP entreated pilots to avoid this location by 2½nm. Although the vectors provided should have afforded a similar margin, it appeared from the RT recording that the controller had anticipated the airliner would turn somewhat tighter than it did. Nevertheless, irrespective of the vectors issued by the APR to place their ac on the extended centreline for RW06, it was up to the B737 crew to sight and avoid any non-transponding traffic –

AIRPROX REPORT No 176/02.

such as the subject glider. The Glider pilot would have been unable to see the B737 approaching from astern and in this overtaking situation only the airliner crew could readily do anything about it. The B737 crew had the opportunity to acquire the other ac, but members recognised that a white glider at a tail-on aspect against a hazy backdrop with little relative motion to draw attention to it, would have been very difficult to spot indeed. From the B737 pilot's report it was evident that neither he, nor his crewmembers, had detected it as they turned onto the RW centreline, despite the well-timed warning from the APR. Despite looking out for gliders, it was unfortunate that this one was not seen, for if it had been, members thought the jet pilot would have given it as wide a berth as practicable. The Board agreed that the cause of this Airprox was a non-sighting by the B737 crew.

With regard to risk, the Board was conscious of the large size of the B737-800 itself and also its relative size compared to the glider. This might explain the underestimation of the vertical separation that existed – the glider pilot reported 300ft whereas it was more probably about 700ft. But here the glider pilot's estimate of 300m was in fact greater than that suggested by the radar recording – about 250m. Nevertheless, in the Board's view no risk of a collision had existed in the circumstances reported here.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Non-sighting by the B737 crew.

Degree of Risk: C.

AIRPROX REPORT NO 176/02

Date/Time: 16 Sep 0855

Position: 5206N 0042W (4nm NW of Cranfield - elev 358 ft)

Airspace: London FIR (Class: G)

Reporting Aircraft Reported Aircraft

Type: Robinson R22 Beech 200

Operator: Civ Trg Civ Comm

Alt/FL: 1800ft 2000ft
(QNH 1024mb) (QNH 1024mb)

Weather VMC CLOC VMC CLOC

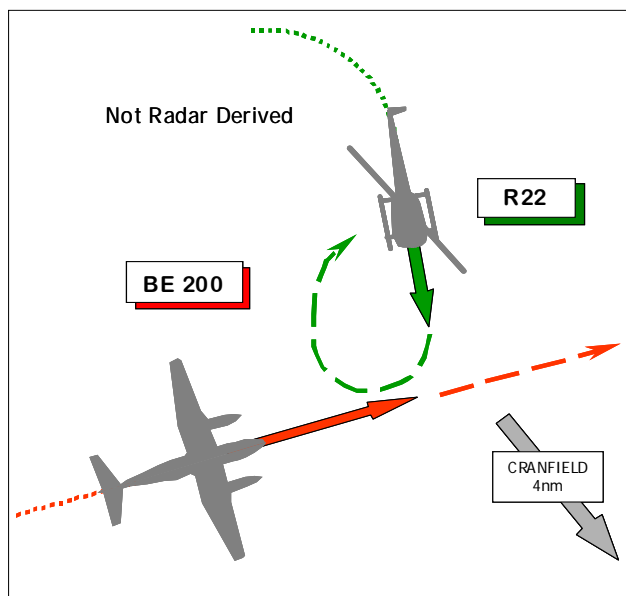
Visibility: 20km 15km

Reported Separation:

200-300m H, 0 V 300ft H, 0 V

Recorded Separation:

Not recorded



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE ROBINSON R22 PILOT reports that he was carrying out a series of autorotations as part of an instructional exercise. His helicopter was coloured predominantly white and was displaying navigation lights and strobes. Transponder, with 7000 squawk was on but neither Mode C nor TCAS were fitted. At the time of the Airprox he was receiving a FIS from Cranfield Approach.

Whilst climbing through 1800ft back towards 2000ft at an airspeed of 60kt, a twin engined, high tail ac was seen in the 2 o'clock position at 200-300m, which then passed R to L ahead at the same height [minimum separation was not reported]. When the other ac was first spotted, the helicopter had just rolled out of a R turn and the pilot observed that lookout in the direction

from which the other ac was approaching would have been more difficult because of the helicopter's attitude. On sighting the other ac, a hard R turn was made, and after about 270° of turn, it was seen maintaining an easterly heading, having appeared not to take any avoiding action. The Airprox, which the pilot assessed as involving a "moderate to high" degree of risk, was subsequently reported to Cranfield by RT.

THE BEECH 200 PILOT reports that he was transiting the area in the direction of Cambridge at 2000ft and 230kt. He was not in contact with any ATS unit and although a transponder and Mode C were fitted, they were both switched off. His ac was white with blue stripes; navigation, anti-collision beacon and strobes were on. The R22 was seen at about 2nm range and was monitored as it approached and passed down his LHS with about 300ft lateral separation and at the same height. The pilot chose not to make a turn to avoid the helicopter as he considered that there was no collision risk, and to do so would put his own ac closer to Cranfield traffic. He also thought that he would have lost sight of the R22 under the port wing if he had turned.

UKAB Note (1): Analysis of the Stansted radar recording shows a primary return about 6nm WNW of Cranfield tracking about 060° at 0850. At the same time, a 7000 squawk, believed to be the R22, is observed manoeuvring at 4.3nm NW of Cranfield at slow speed. Both returns then become intermittent and at 0851:30 the primary occupies the last observed position of the 7000 return. Both ac are seen again at 0851:43, with the primary 0.4nm E of the 7000 return. The primary is tracked to a position 1.7nm S of Cambridge where it is lost at 0900. The primary return is believed to be the Beech 200, which is recorded as having arrived at Cambridge at the time that it fades from radar.

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 radar video recordings.

Pilot members wondered why the BE200 was not squawking although the ac was fitted with a transponder. Cranfield (non radar unit) would not have been able to utilise this information but squawking 7000 with Mode C would have made the ac more conspicuous to SSR equipped ATSUs and importantly to TCAS equipped ac. Also, the BE200 pilot had elected not to call Cranfield, for whatever reason, but given his proximity to the aerodrome, this would have seemed advisable and might even have prevented the Airprox. The R22 pilot had visually acquired the BE200 at short range only after rolling out of a turn. Unknown to him, however, the Beech pilot had seen the helicopter at 2nm range yet had chosen to continue on course, content to cross tracks within 300ft horizontally of the R22 at the same level. Members were not impressed by such airmanship since the BE200 pilot had every opportunity to increase the separation to a safer and more sensible distance. By not taking any 'avoiding action' manoeuvring, the BE200 pilot had flown close enough to cause concern to the R22 pilot and had caused what was an entirely avoidable incident.

Turning to risk, although the R22 pilot had been surprised to see the BE200 to his R after stopping a R turn, he had quickly turned further R to avoid. A different perspective prevailed in the BE200 cockpit, however. The helicopter was seen early at 2nm range and its flight path had been monitored visually. Although he had flown closer than necessary to the R22, the Beech pilot was always in a position to manoeuvre away if necessary. Setting airmanship aside, these circumstances were enough to persuade the Board that there had not been a risk of collision.

PART C: ASSESSMENT OF CAUSE AND RISK

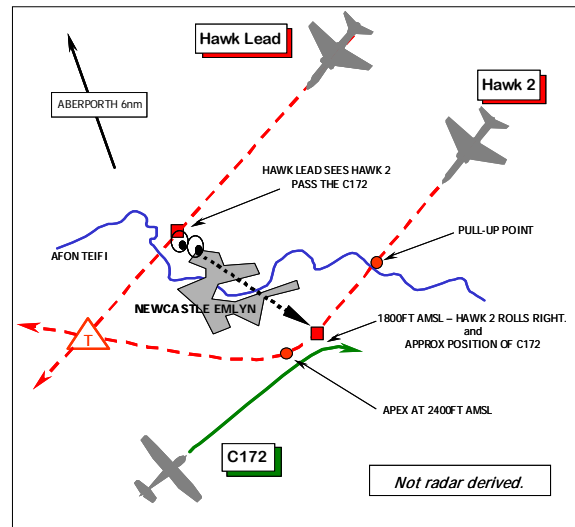
Cause: The BE200 pilot flew close enough to cause concern to the R22 pilot.

Degree of Risk: C

AIRPROX REPORT No 177/02.

AIRPROX REPORT NO 177/02

Date/Time: 16 Sep 1010
Position: 5202 N 0428 W (Newcastle Emlyn)
Airspace: FIR/UKDLFS (Class: G)
Reporting Aircraft Reported Aircraft
Type: C172 Hawk T1
Operator: Civ Club HQ PTC
Alt/FL: 2500ft 1500ft agl
(1018mb)
Weather VMC Mist VMC CLBC
Visibility: 2-3nm 30km
Reported Separation:
100-200ft H, Nil V Not Seen
Recorded Separation:
NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE C172 PILOT reports that he was established in level cruising flight at 95kt, flying at 2500ft altitude. His ac was coloured white with a blue stripe, strobes, red beacon and landing light were selected on. He was squawking 7000 with Mode C, but TCAS was not fitted. The visibility was 2-3nm in "slight mist" with the ac 500ft to 1000ft below cloud. The pilot was receiving a FIS from Aberporth Information and had spoken to them to request clearance through their zone, which had not been approved. He had been advised of a Nimrod operating in the area and had heard transmissions from it although he did not see it. He first saw a dark coloured conflicting military jet at about 500m range. It was straight ahead at the same height, and on a reciprocal track; avoiding action was taken in the form of a diving turn to the R, and the Hawk passed about 100-200ft away to the L, apparently taking avoiding action up and to his R. The other ac's headlight had aided acquisition, but its "incredible speed" had left only a split second in which to react. The risk was assessed as "10/10 – very high" and the pilot thought a certain collision would have occurred if both pilots had not reacted.

UKAB Note (1): The subject Hawk was No 2 of a 2-ship formation. Its pilot did not see the Cessna and was unaware that he had come close to it. However, the Formation Leader saw the incident

and UKAB has accepted a report from him on behalf of the pilot of the reported Hawk.

UKAB Note (2): The Airprox occurred below the cover of recorded radar. However, the Hawk pilot's report was detailed and included a large scale map of the target run with significant events shown, which is the source for the diagram.

THE HAWK FORMATION LEADER reports that he was leading a formation of 2 Hawks when his No 2 was involved in the Airprox. Whereas a solo QFI piloted the lead ac, Hawk 2 was crewed by 2 QFIs. Both ac were coloured black, nose lights and HISLs were selected on and both were squawking 7001 with Mode C. TCAS was not fitted. The ac were operating on a discrete frequency and were not receiving an ATS. The formation was heading 215° at 420kt and 250ft msd, flying a simulated attack profile (SAP) which involved Hawk 2 pulling up and turning R to carry out a dive attack on the target. Visibility was reported as 30km. The pilot of Hawk 2 had commenced his pull up and was passing 1500ft agl in a 20° climb when Hawk Lead saw a pale coloured Cessna about ¼nm ahead of Hawk 2. Hawk Lead called the threat but Hawk 2 was by this time past the Cessna. It was impossible to assess whether the Cessna was to the L or R of the flight path Hawk 2. It should be noted that the Airprox occurred during the final stages of a target

run, when the pilot's attention would be on the ground in the target area and the pilot of Hawk 2 was flying a dynamic "5g" manoeuvre.

THE HAWK PILOTS' UNIT comments that the SAP Dive profile requires the ac to be navigated to the pull-up point for an accurate manoeuvre to be flown and for the simulated target to be acquired. Although the manoeuvre requires the AI and altimeter to be checked for climb angle and roll height respectively, it is a visually flown manoeuvre with the 'head out of cockpit' for the majority of the time. In particular, the area in front of, and above, the ac is checked prior to commencement of the pull-up to ensure there are no conflicts. However, in this instance the conflicting traffic was not seen. Weather may have been a factor as the white coloured light ac had a background of light grey cloud making it difficult to distinguish. Additionally, it is possible that the front and rear cockpit canopy arches restricted the crew's view. However, as they never saw the conflicting traffic it is impossible to be sure. All Sqn pilots have been reminded of the importance of the visual check, prior to the commencement of the dive profile, and to be aware of the potential view restrictions caused by canopy arches.

UKAB Note (3): The Airprox occurred over ground that rises towards the S away from Afon Teifi. Elevations in this area are 400-500ft amsl.

UKAB Note (4): Met Office data for Aberporth (elev 440ft) between 1000 and 1100 shows a visibility of 12km, FEW at 2500ft and BKN at 2800ft. Sennybridge Range to the E had similar conditions. The general picture at the time suggests generally good conditions but with the possibility of inland stratus, which the Cessna pilot may have encountered.

HQ PTC comments that without corroborative (radar) information it is difficult to reach an unequivocal judgement in this, and it feels quite disturbing. The Cessna pilot seems to have had the best perspective and found it to be close; moreover, he mistook the Hawk's attack manoeuvre for avoiding action. Thus, cued by the Hawk's nose-light, it may be that his action alone mitigated this Airprox – although not by a comfortable margin. Only a technical solution could provide proof against such close encounters during operational manoeuvres, when

there are so many demands on spatial awareness.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included pilots' reports, a map extract from the Hawk Formation and reports from the appropriate operating authorities.

It was unfortunate that available information on this encounter was limited as it had not been possible to confirm the exact geometry with any degree of certainty. Nonetheless, sufficient information existed as to indicate that this had been a significant incident, in which luck had played a major part in its safe resolution. It was clear to members that the only participant in full possession of the facts was the C172 pilot, albeit that he had little time in which to react. Moreover, it was also clear that the dynamics of the rolling manoeuvre of the Hawk No 2, which the C172 pilot mistook for avoiding action, fortuitously took the Hawk away from the C172. However, the C172 pilot still had to take robust action in order to clear his flight path from that of the Hawk. Accordingly members agreed that it was the action of the C172 pilot that had resolved the encounter.

A military pilot member, in noting that both seats of the Hawk involved were occupied, offered the hypothesis that the forward lookout may have been degraded because of division of attention associated with instruction during the pull-up and dive attack profile and attention being turned towards the target. As a result the crew of Hawk 2 did not see the C172; additionally the Hawk Lead only saw it after the ac had passed and had no time to call a warning. It was probable, however, that the actions of the pilot of Hawk No 2 were always going to take it away from the C172. Nevertheless members agreed that the safety of both had been compromised.

PART C: ASSESSMENT OF CAUSE AND RISK

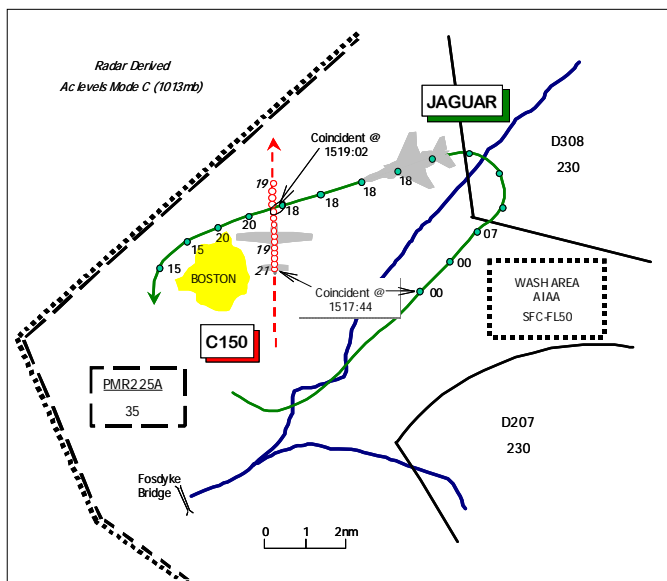
Cause: A conflict in the FIR resolved by the C172 pilot.

Degree of Risk: B

AIRPROX REPORT No 178/02.

AIRPROX REPORT NO 178/02

Date/Time: 16 Sep 1519
Position: 5303N 00005E (2nm NE of Boston)
Airspace: PM R225/ (Class: G)
Wash Area AIAA
Reporting Aircraft Reported Aircraft
Type: Jaguar T4 C150
Operator: HQ STC Civ Pte
Alt/FL: 1500ft 2000ft
(QFE 1022mb) (RPS 1018mb)
Weather VMC VMC CAVOK
Visibility: 30km 8-10nm
Reported Separation:
100ft V, Nil H NK
Recorded Separation:
100ft V, Nil H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE JAGUAR PILOT reports that he was on a weapons instructional sortie conducting loft-bombing training in the Wainfleet Air Weapons Range (AWR) and in receipt of a FIS, he thought, from Wainfleet Range Control on 387.9MHz. His ac was camouflaged grey and HISLs were selected on. Neither TCAS nor any other form of CWS was fitted. Having just completed a LH toss 2 recovery and turned L downwind hdg 250° at 420kt, he became aware of a light ac on a near head-on collision course. The light ac, a Cessna, appeared about 0.25nm ahead, slightly L of the nose and at the same height. He pulled up hard to avoid and passed approximately 100ft above it (as confirmed by HUD video recording) [UKAB Note: Not made available to UKAB]. He assessed that risk of collision had been very high. Range Control had previously notified the Cessna as transiting from Fosdyke Bridge to Boston at 2000ft. Therefore, because the Wainfleet pattern is normally flown at 2000ft, he had adjusted the end of his downwind height to 1500ft (Wainfleet QFE 1022mb) to remain clear. However, the Cessna was further N than he expected and he was unaware of its intentions after Boston.

He adds that this is not the first time that he has had a conflict with transit traffic at Wainfleet and, having spoken to other sqn QWIs,

discovered that he is not alone in this experience. Indeed, he feels that it is only a matter of time before there is a mid-air collision between a FJ using Wainfleet and a light ac. He suggests that transit traffic be advised to remain clear of PMR 225 when LH patterns are being flown at Wainfleet Range.

UKAB Note (1): UK MIL AIP ENR 5.1 para 3.3 states: "A Provost Marshal's Restricted Area (PMR Area) is an airspace of defined dimensions established by the RAF Provost Marshal within which the flight of military aircraft is restricted in accordance with specified conditions."

UK MIL AIP ENR 5.1 para 3.4 promulgates the lateral limits of PM R225, its vertical limits "SFC to 3500ft ALT" together with the remarks: "0830-2300 (local) Monday to Friday. **Note 1:** The lower limit of the area east of E000 30-00 is 1,500ft ALT. **Note 2:** Prohibited to military aircraft except for pilots authorised to enter for range activity at Holbeach or Wainfleet AWRs, or pilots making an approach to Rwy 26 at RAF CONINGSBY using authorised ATC approach procedures."

THE CESSNA 150 PILOT reports that his ac was white with red side flash and that the ac's anti-collision beacon was selected on. He was flying

solo from Fenland to Sturgate, via Manby, and in receipt of radar surveillance, he thought, from Coningsby on 120.8MHz. [UKAB Note: He had requested and was placed under FIS] He had chosen that route to avoid flying through the congested airspace around Cranwell, Waddington and Scampton, all of which were active that afternoon. He was flying at 2000ft (Barnsley RPS 1018mb), at 76 kt and hdg 003°. He was operating under VFR in good VMC, 2000ft below cloud, he thought, with a flight visibility estimated 8 to 10nm although forward vision was difficult because of haze. Whilst on transit between Fenland and Boston, Coningsby gave warnings of ac crossing his flight path. Twice he saw nothing but on one occasion he observed an ac tracking L to R across his flight path at a similar height. He kept the ac under observation and watched it turn in southerly direction and out of sight. He estimated that minimum separation distance from this ac was 2nm and assessed that it posed no threat. After a short interval Coningsby requested that he descend to 1500ft for MATZ penetration and he complied. Later, when over the village of Havis Enderby, Coningsby advised that an Airprox had been filed against him by a Jaguar pilot. He had not seen the Jaguar and was, therefore, unable to provide an assessment of risk. Although he adds that he thought he was safe as he was under radar surveillance from Coningsby.

[UKAB Note: As a footnote to his report, the C150 pilot provided a route weather observation in which he described ambient conditions as "*Low cloud at 2500ft, haze, overcast no sunshine, wind 070/10.*"]

UKAB Note (2): UK AIP ENR 5.2 promulgates the lateral limits of The Wash Area AIAA and states: "*Pilots are strongly recommended to avoid the area, but if this is not possible, a LARS is available from Marham ATC on 124.150MHz, Coningsby ATC on 120.800MHz and Waddington ATC on 127.350MHz. Hours: Permanently active Mon to Fri. Vertical Limits: SFC to FL 50. Remarks: Because of the holding patterns associated with Danger Areas EG D207 and EG D308 special caution is advised in the Wash Area.*"

THE JAGUAR PILOT'S UNIT comments that the downwind leg of the overland academic Toss/Loft pattern at Wainfleet AWR is artificially high to provide relief from ac noise to local residents, as laid down in STCAWROs [UKAB Note: STC Air

Weapons Range Orders]. It also extends considerably beyond the boundary of the AWR. Unfortunately, this then puts ac using this pattern into the airspace commonly used by light ac avoiding the Wash weapons ranges and transiting between Skegness and Fenland. Allied to this limitation is the fact that the off-target recovery and downwind leg of a range pattern is a high workload period for crews, with a significant number of in-cockpit tasks to complete; this is further exacerbated when the crew is involved in a OCU teaching sortie as in this case. We therefore fully endorse and support the recommendation by the pilot that transit traffic is advised to avoid PMR225 airspace when the Wainfleet overland patterns are active.

MIL ATC OPS reports that the timings shown on the Coningsby RTF transcript of frequency 120.8MHz are estimated to be 5min 8sec in error and those on the Wainfleet RTF deskside transcript approximately 2min 21sec in error. [UKAB Note: Accordingly, for clarity Coningsby and Wainfleet timings have been omitted. All timings provided hereafter are those from the LTCC radar data video recording.]

The C150 pilot free-called Coningsby Zone (ZONE) on 120.8MHz stating that he was "*.... en-route to Sturgate via Boston and Manby*" and requesting "*FIS for flight at 2000ft*". The pilot was placed under FIS, a squawk of 3757 allocated and the Barnsley RPS, 1018mb, passed. Meanwhile the Jaguar, squawking Mode 3/A code 7002 with Mode C, was operating VFR with Wainfleet Range Control on frequency 387.9MHz conducting loft attacks. This required the use of PMR 225 for positioning. One min 6sec after the initial call from the C150 pilot, Coningsby Approach (APP), on behalf of ZONE, passed traffic information to Wainfleet stating "*.... light civil transit for you.... Fosdyke Bridge Boston 2000ft on the Barnsley 1018*". [UKAB Note: The call from APP was answered by Wainfleet Tower Assistant as the controller was engaged upon another landline conversation.] The proposed transit was approved by the Wainfleet controller who then transmitted to the Jaguar pilot "*C/s there's a transit traffic Fosdyke to Boston at 2000' on the Barnsley Pressure 1018*".

The Jaguar pilot then requested clarification of the position of the transit traffic to which the controller responded "*...between Fosdyke Bridge and*

AIRPROX REPORT No 178/02.

Boston, northbound at 2000ft". The Jaguar pilot replied "*Copied we're descending 1500*". Two min 10sec later Wainfleet Range Controller rang Coningsby ZONE to advise that, in respect of the 2000ft transit traffic, "*My traffic L long downwind will fly downwind at 1500ft*". [UKAB Note: ZONE responded "*1500ft downwind, Roger, maintaining 2000ft on the Barnsley*."] However, there was no formal co-ordination during this exchange. Twenty sec later the Jaguar pilot, by now in the downwind position, requested a further traffic update on the transit traffic. Consequently, Wainfleet Range Controller rang Coningsby once again to request the position of the 2000ft transit traffic. The Coningsby Supervisor answered the call and responded "*Fosdyke Bridge NE range 4nm northbound 2000ft Barnsley*". The Wainfleet Range Controller acknowledged the information and relayed it to the Jaguar pilot as "*4nm NE of Fosdyke Bridge now hdg N towards Boston*". [UKAB Note: To which the Jaguar pilot responded "*Copied we're still at 1500*"]

Whilst that telephone conversation was in progress, ZONE passed traffic information to the C150 pilot "*.....traffic R 1 o'clock 5nm crossing R to L indicating 500ft below*" to which the C150 pilot replied "*... looking for traffic. Have traffic in sight ...*". [UKAB Note: This traffic was most probably the subject Jaguar in the Wainfleet Range pattern.] Two min 20 sec later ZONE passed further traffic information to the C150 pilot "*....traffic R 2 o'clock 3nm fast moving crossing R to L indicating 100ft below*". [UKAB Note: The C150 pilot responded "*C/s looking for traffic*."] ZONE updated the traffic information 17 sec later "*...that traffic now R 1 o'clock half a mile*". [UKAB Note: There was no response from the C150 pilot.] Very shortly after this the Jaguar pilot reported to the Wainfleet Range Controller "*C/s downwind or on base ... and a just to let Coningsby know I just missed that guy by about 100ft*".

The Wainfleet Range Controller then reported details of the incident to the Coningsby Supervisor, during which he said "*... it was on the end of the recovery cause he was ... pulling up above erh, he's pulling up to the cloud base ... and dropping back down and on the recovery getting down to 1500ft. But it was on recovery ... he says he missed by 100ft*".

[UKAB Note: Met Office archive data reveals that Wainfleet (EGYW) METARs for 16 Sept 2002 were: 1450Z 02008KT 9999 FEW027 BKN038 15/11 Q1022 BLU

1550Z 01008KT 9999 FEW024 BKN040 15/11 Q1022 BLU.]

It should be noted that Wainfleet Range Control has no access to radar. Moreover it should also be noted that no formal ATS is provided by Wainfleet Range Controller to ac operating within PMR225 and EG D308. [UKAB Note: Essentially a procedural service is provided whereby the controller approves or refuses access to D308 and, within Range patterns, live or dummy attacks on specified targets within D308. The controller may also issue clearance for ac in receipt of service from an ATSU to penetrate the Danger Area iaw specified conditions.] However, when information on PMR 225 transit traffic is passed to the Range Controller, this is relayed to ac operating on the Range Control frequency. It is evident that Coningsby passed traffic information, which was then relayed accurately to the Jaguar crew. Furthermore, STCAWRO Sect 1 Pt 2 Chap 7 Para 12c warns aircrew that PMR225 "*... is not recognised by the civil authorities and light ac may be encountered*."

HQ STC comments that since PMR225A/B is not published to the GA community and is Class 'G' airspace, GA pilots have every right to fly through it unaware that military pilots are conducting high-workload, dynamic manoeuvres within it. Therefore, the onus remains on both pilots to maintain the 'see and avoid' principle outside the D308 Wainfleet Danger Area. Deconfliction in the form of height separation was established when the Jaguar pilot agreed to descend from 2000ft to 1500ft for the downwind leg of his bombing pattern. However, 2 passes later, at 1519, the Airprox occurs when the Jaguar pilot reverted to a 2000ft downwind leg. Why did he revert to his normal pattern height?

The C150 pilot sensibly obtained an ATS from Coningsby in the Wash AIAA, notifying his route as "*via Boston and Manby*" and maintained an agreed 2000ft alt. However, the routeing passed by Coningsby APP to Wainfleet Tower Assistant was "*Fosdyke Bridge Boston*", and then Wainfleet Range Controller – Range Safety Officer (RSO) - relayed "*Fosdyke to Boston*" to the Jaguar pilot,

later repeated as '*between Fosdyke Bridge and Boston*'. Three min later the Jaguar pilot requested an update of the information, which was passed as "*4nm NE of Fosdyke Bridge now hdg N towards Boston*". No further information was passed until the Airprox occurred roughly 4 min later. It would appear that because the Jaguar pilots were told that the traffic was only routeing to Boston, not beyond it, and no further information was forthcoming after the requested update, the Jaguar pilots incorrectly discounted the presence of the C150 as a factor to their flight.

Coningsby ZONE was incorrect in not passing the full routeing of the C150 as passed to him by its pilot. Also, it is disheartening that ZONE, being aware of the potential conflict by virtue of his radar picture, did not continue to update the Wainfleet RSO on the C150's progress. With greater situational awareness ZONE should have realised that traffic warnings passed to the C150 pilot would have been of greater value to the Wainfleet RSO and the Jaguar crew. It is mandatory for RSOs to pass "*significant known traffic adjacent to the range pattern being flown*", and whilst this was done initially, the information was not updated. The RSO should have actively sought continuous traffic updates from Coningsby ATC via his direct phone link. STC Ops Support has been asked to review the responsibility of Coningsby ATC for provision of service to Wainfleet.

Given the high workload of dynamic manoeuvring, cockpit checking, coupled with in-cockpit instruction, it is probable that the Jaguar crew's lookout for a white, light ac was reduced. The military flow arrow on LFCs is potentially confusing, since it is contradictory to the bombing pattern flown in the PMR. Moreover, the toss-bomb circuit pattern, as was being flown on this occasion, often extends close to the edge of the PMR.

Finally, we would recommend wide dissemination amongst the GA community of the existence of the PMR, the dynamic nature of the activities within it, and also a Range contact frequency. Had the C150 been in contact with the RSO rather than Coningsby, this Airprox is likely to have been avoided. Ultimately, however, this Airprox was a result of a failure to see and avoid in sufficient time, although it could have been prevented had any of the 4 human elements involved been more situationally aware.

UKAB Note (4): Analysis of the Claxby radar data recording reveals the Jaguar, squawking SSR Mode 3/A code 7002 with Mode C, established in a LH pattern in PM R225 and D308, the downwind leg of which passes just to the N of Boston. The C150, squawking SSR Mode A code 3757 with Mode C, is shown maintaining a steady northerly track. During the pattern preceding that in which the reported encounter occurred, the Jaguar crosses 3.16nm ahead of the C150 and 6-700ft below before passing 3.36nm W of the C150 during the pattern base leg. At 1517:44 the Jaguar is inbound on the target run 3.79nm to the E of the C150. The C150 displays Mode C throughout the period covered by the diagram; however, for clarity only a few relevant Mode C indications are included. On the first 3 radar returns the C150's Mode C displays 021, the next shows 020 and, thereafter, the remainder display 019, which equates to 2170ft on Wainfleet QFE. Similarly, for clarity where the Jaguar displays no Mode C, this is indicated on the diagram by its absence. The radar sweep timed at 1518:00 shows 007 on the Jaguar's Mode C, indicative of the toss manoeuvre having been commenced. The Jaguar commences a L turn and at 1518:31 has steadied downwind on a track converging with the C150. The next sweep, timed at 1518:37, displays Mode C at 018, which equates to 2070ft on the Wainfleet QFE. At 1519:02 the subject ac are 0.21nm apart with the Jaguar's Mode C indicating 100ft below that of the C150. On the next sweep at 1519:10, by which time the respective tracks have crossed, the Jaguar's Mode C indicates 100ft above that of the C150. This is consistent with the Jaguar pilot's report that he pulled up and passed 100ft above the C150.

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 recording and reports from the appropriate ATC and operating authorities.

From the outset Board members expressed concern that events, which had conspired to cause the reported encounter, had existed for a number of years suggesting deficiencies in existing safety nets. Members noted the disparity

AIRPROX REPORT No 178/02.

in regulations pertaining to the airspace within which the incident occurred. In order to afford protection to military ac conducting high energy, training weapon release manoeuvres or holding patterns, other military ac are excluded from PMR225 iaw regulations promulgated in the UK Mil AIP. But these regulations are neither applicable, nor available, to civil pilots. The Wash Area AIAA, however, surrounds PMR225, and whilst the UK AIP entry refers to the holding patterns associated with Danger Areas D207 and D308, no mention is made of the high energy, range patterns such as that upon which the Jaguar crew was engaged. Indeed, one civil ATC member suggested that, from the civil perspective the airspace, notwithstanding the UK AIP recommendation for its avoidance, is open FIR within which it seems inappropriate to conduct such manoeuvres if they are incompatible with the maintenance of VFR. Continuing this theme, a GA pilot member expressed concern that insufficient publicity has, apparently, been given to the nature of activities conducted within the airspace by military ac.

Members also noted that the UK AIP Wash AIAA entry states that a LARS service is available for transit pilots, although the C150 pilot had requested a FIS. Nevertheless, although FIS was applied, in practice Coningsby ZONE had acted above and beyond the provision of FIS to the extent that the C150 pilot was convinced that he was 'safe' being in receipt of "*radar surveillance*". Moreover, it was noted that whilst traffic information was passed to the C150 pilot, the same information flow to the Jaguar pilot was not updated. Of the principle participants in the encounter, it was only Coningsby ZONE who had a full picture of the developing situation. Some wondered why the C150 was permitted to transit the airspace at 2000ft given that the Wainfleet Range pattern height downwind is 2000ft and the pattern extended specifically to minimise noise disturbance to the residents of Boston. Despite this, the Jaguar pilot sought to achieve some form of separation from the transit C150 by opting to adjust his downwind height to 1500ft. Although this was not co-ordination, it appeared to the Board that Coningsby ZONE and the Wainfleet RSO had both been content to accept it as such.

Turning to the information provided to the Jaguar crew, members noted the variations in the C150

pilot's intended routeing as relayed to the Jaguar crew. Moreover, a military pilot member advised members, the Wainfleet RSO had a responsibility to update the Jaguar crew on the progress of the C150, noting that the last traffic update was 4 min prior to the encounter. The lack of information update, together with the implication that the C150 was not routeing N of Boston and the slow, relative speed of the C150 may have caused the Jaguar crew eventually to discount its presence as a factor to their flight. Noting the deficiencies in the traffic information flow, some members asked whether an ATM should be provided at Wainfleet, given that the RSO is a military ATCO. Some members also wondered whether the C150 should have been on the same frequency as the Jaguar, although it was acknowledged that the C150 was only VHF equipped whereas the Jaguar crew was working UHF. The Board welcomed and endorsed the HQ STC review of the responsibility of Coningsby ATC for provision of service to Wainfleet. Additionally, the Director undertook to raise the various points of concern with DAP.

Finally, members considered the encounter itself. It was noted that although traffic information on the Jaguar had been passed to the C150 pilot, he had remained unsighted; probably this was due, members thought, to a combination of restricted vision across cockpit and the high wing of the C150. As for the Jaguar crew who, for whatever reason, had reverted to a downwind height of 2000ft, members thought that in-cockpit demands of the weapons-sortie profile together with instruction may have resulted in the late visual acquisition of the C150. Nevertheless, the Jaguar pilot saw the C150 and had time to change his flight path, just; this convinced members that while the risk of colliding with the C150 had been removed, the safety of both ac had been compromised.

PART C: ASSESSMENT OF CAUSE AND RISK

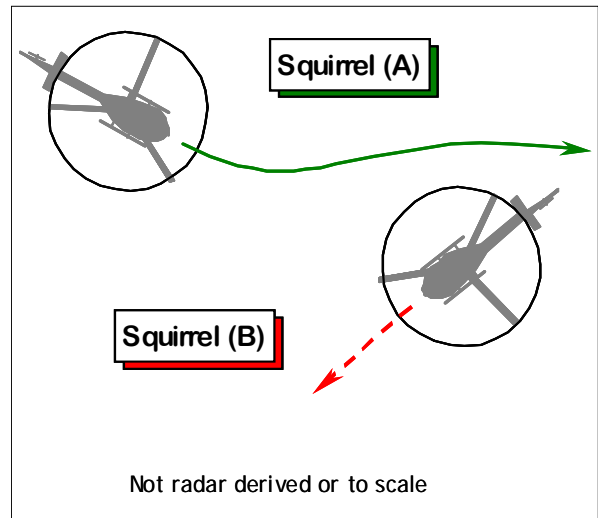
Cause: A non sighting by the C150 pilot and a very late sighting by the Jaguar pilot.

Degree of Risk: B

AIRPROX REPORT NO 179/02

Date/Time: 18 Sep 1207
Position: 5248N 0302W (1½nm NE of Pant)
Airspace: UKDLFS (Class: G)
Reporting Aircraft Reported Aircraft
Type: Squirrel HT1 Squirrel HT1
Operator: HQ PTC HQ PTC
Alt/FL: 130ft agl 100ft agl

Weather VMC CLBC VMC CLBC
Visibility: 15km NK
Reported Separation:
30m H Not seen
Recorded Separation:
Not recorded

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

THE SQUIRREL HT1 PILOT (A), a QHI, reports that he was flying a low-level instructional navigation sortie in LFA9 with a QHNI and student navigator, below a 3000ft cloudbase. His helicopter has a black & yellow colour scheme and the HISL was on. Whilst in receipt of a FIS from Shawbury APPROACH (APP) on 242.00MHz, a squawk of A0221 was selected with Mode C; neither TCAS nor any other form of CWS is fitted.

Flying at 130ft agl, heading 120° at 110 kt, another Squirrel helicopter was suddenly spotted at 11 o'clock about 35m away crossing ahead directly from L to R. He broke hard left to avoid the other helicopter and passed at the same height about 30m behind the other Squirrel, whose pilot did not appear to alter course at all. The sortie was then terminated and they returned to base. He added that the other Squirrel was obscured in the blind spot behind the cockpit strut and stressed that if he had not turned when he did, he estimated that a collision would have occurred 1–2 sec later. The risk was assessed as "very high".

THE SQUIRREL HT1 PILOT (B), a QHI, reports that he was flying a low-level instructional navigation sortie in LFA9 with a QHNI and student navigator. His helicopter has a black & yellow colour scheme and the HISL was on. Whilst in receipt of a FIS from Shawbury APP on

242.00MHz, a squawk of A0221 was selected with Mode C; neither TCAS nor any other form of CWS is fitted.

At the time of the Airprox he was approaching a timing check feature - a small lane - heading 227°(M) at 90 kt. The check feature was being pointed out to the student navigator, when he spotted a Squirrel helicopter - high – at L 11 o'clock descending right to left which he called out as a possible confliction - this helicopter was not the ac flown by the pilot of Squirrel (A) but was another ac in the area. He stressed that he is aware of the blind arcs of the Squirrel and regularly adjusts his position to look around them, but at no time did he or his crew see Squirrel (A) to their right.

MIL ATC OPS reports that Shawbury APP was listening out on a quiet frequency providing a FIS to the crew of Squirrel (A) and the crew of Squirrel (B). At 1207:04, APP heard the crew of Squirrel (A) transmit "Squirrel at Llanymynech at low level can you read [C/S]". There was no reply to this blind transmission so, at 1207:14, the broadcast call was repeated "Squirrel at Llanymynech or Pant low level can you read [C/S] on stud 5". Whereupon another helicopter "...3 miles south of Pant..." responded, however it turned out to be another helicopter and not Squirrel (B). No mention of an Airprox was made on the frequency

AIRPROX REPORT No 179/02.

and it was not until some time later that the ATC SUPERVISOR was advised by telephone that the crew of Squirrel (A) had aborted their sortie and returned to Shawbury because of the encounter.

AIS(Mil) provided a synopsis of the Cleve Hill Radar recording that proved inconclusive. There were a number of ac squawking A0221 in the area, although none within 15nm of the reported Airprox position. The A0221 squawk is allocated to Shawbury ATC and assigned to Station based ac operating not above 3000ft BARNESLEY RPS, which permits LATCC (Mil) to apply a deeming rule against ac displaying this code. Pant is situated outside Shawbury's notified Area of Intense Air Activity (AAIA), where intensive helicopter activity may be encountered, however it is still within LFA9, which is also notified for intensive helicopter activity. It is unlikely that the conflict would have shown on the Shawbury Radar and with operations of this nature on a 'quiet' frequency traffic information is not provided. Consequently, there appears to be no Military ATC involvement in this Airprox.

THE SQUIRREL PILOTS' UNIT comments that fortunately a mid-air collision was avoided. There has been frequent discussion regarding the poor conspicuity of both the Squirrel and Griffin ac colour scheme, but in this case it is not considered to have been a contributory factor. This incident was caused by both crews failing to see each other most probably due to the reduced visibility afforded by the cabin windscreen strut arrangement, which is well known by all Squirrel crews. Airprox such as this only serve to reinforce the message regarding moving one's head to aid lookout. However, even experienced crews can be caught out and this Airprox should be used as a reason why the latest technologies should be installed in military ac to aid safety. The cost of fitting a TCAS system to the Squirrel fleet would be far cheaper than the cost of a single mid-air collision. Efforts should be made to procure a TCAS system that would alert helicopter crews operating at low-level of other ac in their immediate vicinity.

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

UKAB Note (2): LFA9, is a Dedicated User Area, primarily for the use of helicopters based at Shawbury. At any one time up to 20 helicopters

may be operating in the Area; the identity of the reported Squirrel (B) was resolved by the unit.

HQ PTC comments that there are (old) lessons to be re-emphasised from this Airprox: Monitoring previously acquired traffic is at the expense of searching for others and clearing blindspots is a continuous process. However, if conspicuity has been discounted as a factor, we can offer no formula to eliminate these risks, short of the technical solution suggested (TCAS) - which Police and EMS helicopters have apparently found to be so valuable.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available to the UKAB 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.

The Board endorsed the Squirrel Unit's view regarding the efficacy of TCAS, or a similar CWS, which would provide some additional help to the crews in detecting the presence of other transponding ac that might pose a threat. Whilst members recognised that a full commercial fit ACAS II would not necessarily be appropriate in the LFS, the Board agreed that a CWS along the lines of the relatively low cost systems now being fitted to Police Air Support Unit and pipeline inspection helicopters would be invaluable.

In the absence of a CWS, members wondered what else could be done by the Unit to prevent a recurrence, as these two crews were both from the same station and operating in 'their own backyard' on local training sorties. Military aircrew members explained that some STC stations required crews to brief all low-level routes flown by their aircrew. Mission planning technology is available for some ac types that permits procedural deconfliction to be effected or give warnings of crossing tracks. The PTC member recognised the usefulness of such measures, but counselled that they relied on accurate timing; any delays or errors in navigation could render deconfliction ineffective. For these helicopter exercises others thought that more use should be made of 'Blind Calls' on the common frequency, which could heighten awareness and help pilots

build a mental air picture, or, perhaps ATC could provide more assistance. Most, however, felt that this was a problem which unit staff were in the best position to tackle, but with up to 20 helicopters operating in the same area there seemed a strong possibility of a recurrence if nothing was done.

The Board was conscious of the instructional nature of both sorties – navigation - but crew members were intrinsically responsible for lookout as well; three pairs of eyes in each helicopter had been defeated. For whatever reason, the pilot of Squirrel (B) had not seen the other Squirrel (A) at all and the latter's pilot had only seen (B) moments before he managed to break hard left away from it. Members determined unanimously that this was the cause of the Airprox in the 'see and avoid' environment of the LFS.

The debate then turned to the risk inherent in this encounter. As the crew of (B) had not seen (A) they evidently had no influence over the outcome of this very close quarters situation. The pilot of Squirrel (A) had not seen (B), obscured behind the canopy strut, until it was an estimated 35m away,

moments before he could turn away from it. At these speeds a distance of 30m – about 3 rotor spans - could be covered in about ½ sec, which suggested that the manoeuvre was an instinctive reflex reaction to the sighting. It is normally considered that a minimum of 2-3 sec is needed to detect the threat, assess the response and then make the control input to start changing the ac's flight path. Though the pilot's avoiding action was enough to change the ac's attitude, members wondered about the flight path in the time available. The miss distance appeared to owe just as much to (B)'s crossing velocity. For these reasons the Board agreed unanimously that an actual risk of collision had existed in the circumstances reported here.

PART C: ASSESSMENT OF CAUSE AND RISK

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

Degree of Risk: A.

AIRPROX REPORT No 180/02.

AIRPROX REPORT NO 180/02

Date/Time: 18 Sep 1032

Position: 5302N 0051W (13nm W of Cranwell
- elev 218 ft)

Airspace: Lincolnshire AIAA (Class: G)

Reporting Aircraft Reported Aircraft

Type: Vigilant T MK1 Dominie T MK1
(motor glider)

Operator: HQ PTC HQ PTC

Alt/FL: 1800ft 2000ft
(QFE 1014mb) (QFE 1012mb)

Weather VMC CLOC VMC NR

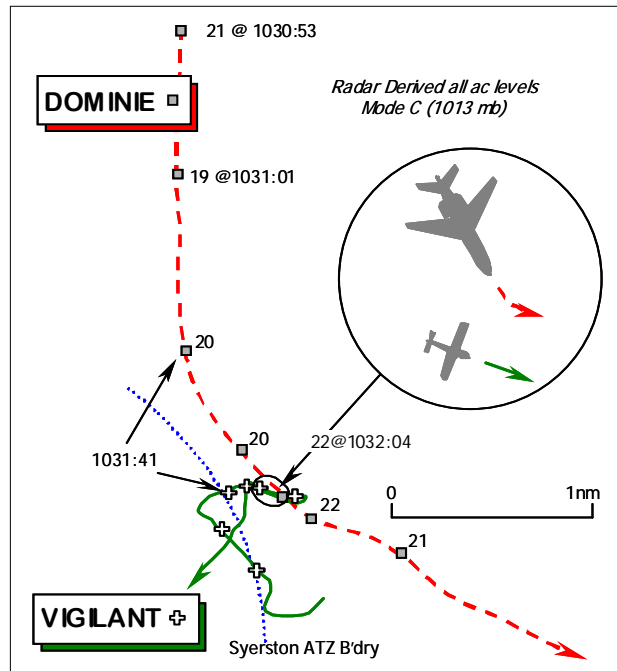
Visibility: 15-20 Km 8 Km

Reported Separation:

3-400ft V, nil H 200ft V, 700yd H

Recorded Separation:

tracks merged



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE VIGILANT T MK1 MOTOR-GLIDER PILOT reports that his motor-glider has a predominantly white colour scheme, but the HISL and landing lamp were on whilst conducting an instructor training sortie in the Syerston ATZ. He was in communication with Syerston RADIO on 125.425MHz and flying in clear air 2-300 ft below scattered cloud with an in-flight visibility of 15-20km.

Flying at about 1800ft Syerston QFE (1014mb), about 1.5nm E of the aerodrome he thought, they had just rolled out of a right turn from 060° onto a SE'ly heading at 50kt. A visual check was made to the 'blind [port] side' whereupon he spotted a red & white Dominie ac at 9 o'clock - 500m away and 200ft above his motor-glider heading directly towards them. To avoid the Dominie, the motor-glider was immediately put into a descending R turn at the same time as the Dominie crew also initiated a climb and passed 3-400ft directly above his Vigilant. From his perspective he thought it looked as though the Dominie had just broken through the cloudbase by about 2-300ft with his undercarriage down.

He assessed the risk of a collision as "high" and added that if the Dominie pilot had maintained his original flight path and he had not stopped his motor-glider's turn then the jet would have been in his blind arc astern. An initial RT report was made to the Syerston Duty Instructor who confirmed he had seen the occurrence.

THE DOMINIE T MK1 PILOT reports his ac has a red & white livery and HISLs were on whilst being radar vectored at 2000ft Cranwell QFE (1012mb) for a Pilot's Assistant (PA) PAR recovery at 140kt to RW09 at Cranwell. He was in receipt of a RIS from Cranwell APPROACH (APP) and squawking the assigned code with Mode C; neither TCAS nor any other form of CWS is fitted.

Whilst in a port turn onto S, he was advised by APP of traffic 4nm SW apparently indicating low-level but it could not be seen. A further traffic report was given by APP for traffic in the same position but still nothing could be seen. Shortly afterwards another ac was reported - 4nm S manoeuvring believed to be a motor-glider. At that point a crew member reported visual contact on a motor glider, well clear. APP then reported the traffic at ½ nm to the S manoeuvring. Upon

sighting the subject motor-glider at 1 o'clock and slightly low – though he did not specify the range - he initiated a gentle pull-up and tightened the turn to the L slightly to ensure separation, finally rolling out on a heading of 120° as the motor-glider passed about 200ft below his ac 700yd away to starboard with no risk of a collision.

MIL ATC OPS reports that at 1025:41, the Dominie was identified and placed under a RIS by APP for the PA PAR to RW09 at Cranwell. This procedure requires the ac to be flown by the PA and is designed to cater for any potential pilot incapacity. Consequently, this practice approach requires an extended feed onto the centreline at 2000ft Cranwell QFE (1012mb), from where the ac is flown on autopilot down to 500ft QFE, thereafter, the ac is flown manually on the procedure by the PA.

At 1025:50, APP issued the QFE, which was read-back, and the Dominie crew instructed to descend to 3500ft initially, followed at 1029:00, by further descent to 2000ft. At 1029:51, traffic was reported "*...south-west, 5 miles manoeuvring indicating low level*", followed shortly afterwards by "*...further traffic south west 4 miles manoeuvring no height indication*". Neither of these contacts was the subject Vigilant which was called for the first time at 1030:36, "*....further traffic south 4 miles manoeuvring, believed to be a motor glider*". This traffic was reported again at 1031:02, "*...report checks complete previously reported traffic south 2 miles northbound, believed to be a motor glider*". The Dominie crew was instructed to turn L onto 150°, which was acknowledged at 1031:17. However, the controller queried 26sec later if the crew had initiated the turn. This was followed by further traffic information on the subject Vigilant at 1031:43, "*...previously reported motor glider now south, ½ a-mile manoeuvring*" to which the crew reported 3 sec later "*...visual with that*". At 1032:19, the Dominie crew advised "*...just had to pull up over the motor glider...*", but no other reference was made to the Airprox.

The APP controller reported that the PA procedure would cause the ac to turn slower than usual so, to compensate for this, he had elected to give the Dominie an early turn for the extended feed and transit between the Syerston ATZ and Winthorpe avoidance areas. Analysis of the Claxby Radar video recording and comparison to

an aeronautical chart shows the Dominie routing to the NE of Syerston, close to but just outside the ATZ boundary, which is depicted on the Cranwell Radar video map that has an inaccuracy of about 100m.

The Dominie was recovering to Cranwell from the N, so given the complexity of the airspace and the nature of the approach the decision to vector the ac between Syerston and Winthorpe appears to be sensible and expeditious. Cranwell was colour code WHITE - minimum weather 5km Vis; SCT 1500ft aal - and observed conflicts were called in a timely and accurate manner. Given that the Dominie had initially been turned onto 180°, followed by 150°, the use of cardinal points within traffic information was entirely appropriate, allowing the crew to sight the motor-glider in good time and execute the necessary avoiding action. It appears as though APP applied the RIS correctly and effectively.

THE VIGILANT PILOT'S UNIT comments this incident is almost identical to Airprox 102/01. In that incident - and apparently here also - a Dominie was vectored through an area of known gliding activity and causing sufficient concern to the Vigilant crew for them to report the incident.

Following Airprox 102/01, Cranwell took measures to ensure its radar video maps were appropriate and also issued further guidance to its controllers. Unfortunately, these measures have not prevented a similar situation recurring. Perhaps more worrying, is that the Dominie involved here appears to have descended from IMC into an area of known glider activity.

To protect its intense glider operations, Syerston has an established ATZ of 2nm radius up to 2000ft above its elevation of 224ft, with an associated warning of winch launches to 3000ft aal. What may not be apparent to other airspace users is that gliders operate upwind from their launch site, often beyond the ATZ boundary. Whenever Cranwell are using RW09, it is likely that Syerston traffic will be operating between Syerston and Newark, which is only 12–14nm from the Cranwell RW09 threshold.

The measures taken after Airprox 102/01 appear to be insufficiently robust to prevent such incidents recurring. It was fortunate in this case

AIRPROX REPORT No 180/02.

that the Dominie crew broke cloud when they did or this Airprox could easily have been an accident.

HQ AIR CADETS comments that the location of this Airprox appears to have been just outside the edge of the Syerston ATZ and it is evident that the Dominie's flight path was orientated too close to an area of known intensive activity - it is not surprising that it came into conflict with another ac. It would have been better if the Dominie had been routed further afield under the radar service. Cranwell has looked at their procedures once before, however, they have been found wanting a second time.

THE DOMINIE PILOT'S UNIT comments that this Airprox once again highlights the extremely busy nature of the Class G airspace in this area. When RW09 is in use at Cranwell, the extended centreline passes close to the Syerston ATZ. On this occasion, the Cranwell radar picture was certified as accurate to within 100m and the track of the Dominie was observed by the controller (and the ATC LEO who was waiting to conduct the PAR) to pass approximately half a mile from the ATZ. The warnings passed by the controller were correct and resulted in the Vigilant being sighted and timely avoiding action being taken.

Clearly, however, the area upwind of Syerston is best avoided since the gliders operating there do not receive a radar service. Normal PAR approaches intercept the centreline within 10nm of Cranwell at 1500ft Cranwell QFE, but PA's practice approaches, like this one, have till now been vectored to intercept at 12nm and 2000ft QFE. When RW09 is in use, PA's approaches will now fly a normal pattern, which will increase separation from RAF Syerston.

Motor-gliders such as the Vigilant do not need to remain upwind of their base and pilots should, therefore, ensure that where possible they remain clear of the surrounding patterns and approach lanes. Once again, this is a reminder that all airspace users need to be aware of the needs of others and act accordingly.

HQ PTC comments that we are equally concerned that this is a near identical repetition of a previous Airprox. Although the Dominie pilot had been given sufficient warning by ATC of the Vigilant and was able subsequently to see and avoid it, the Vigilant had no such advantage. We note that

Cranwell has decided not to carry out such protracted approaches in future when RW09 is in use.

UKAB Note: The Claxby radar recording illustrates this Airprox relatively clearly. The Dominie is shown southbound descending to 2100ft Mode C (1013mb) - about 2070ft Cranwell QFE (1012mb), whilst the Vigilant motor-glider is shown tracking slowly NW bound within the lateral confines of the Syerston ATZ - 1800ft Syerston QFE (1014mb) would equate to about 1740ft Cranwell QFE. The motor-glider commences a sharp R turn at 1031:17, eventually steadying on an easterly track at 1031:41, exiting the Syerston ATZ as the Dominie is shown in a L turn at 2000ft Mode C about 1970ft Cranwell QFE (less than 30ft above the upper limit of the Syerston ATZ) moments before the third transmission of traffic information from APP on the Vigilant. The tracks merged about 0.2nm clear of the ATZ boundary before the radar returns timed at 1032:04, just as the Dominie pilot's reported avoiding action climb is apparent from 2000ft - 2200ft Mode C. The Vigilant pilot's avoiding action turn is not plainly evident, but appears to continue SSE for one more sweep before reversing sharply and backtracking to the NW.

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 authority.

The difficulties of vectoring traffic under a RIS through confined airspace in a busy radar pattern were well understood by controller members and the use of the extended pattern for the PA's approaches close to the Syerston ATZ boundary had clearly been part of the problem here. Unlike Airprox 102/01, where the Dominie had been vectored into the ATZ, in this instance, the crew had been instructed to turn clear of the boundary and ended up in close proximity to the Vigilant M-G which was just outside and not inside the ATZ as the latter's pilot had thought at the time. Whilst APP had provided three separate transmissions of traffic information, which had ultimately enabled the Dominie crew to spot the Vigilant, and notwithstanding the RIS where the pilot was

responsible for safe separation from other ac, a military controller member suggested that the jet might have been turned away from the M-G earlier by the controller. However, the PA was apparently flying the ac at the time using the autopilot, hence the wide turn. The radar recording had shown that the Dominie crew had not turned when instructed, which was probably why the controller queried 26sec after the instruction had been transmitted if the turn had been initiated. The Mil ATC advisor stressed that the controller would have been endeavouring to comply with the agreed procedure, thereby allowing the pilot the flexibility he needed for this exercise as much as possible, but which required a bigger pattern than is the norm. With the traffic information provided by APP, members thought that the Dominie pilot himself could have elected to turn earlier, which might have enabled him to give the Vigilant a wider berth. This was a matter of judgement and it seemed that the pilot had allowed the PA to continue with his ac handling exercise rather than execute the turn earlier. Members noted the unit's decision to revert to standard patterns for this exercise, which may help reduce the potential for a recurrence of the circumstances reported here. Nevertheless, in this highly utilised piece of airspace the Board strongly endorsed the Dominie pilot unit's view that local airspace users must be keenly aware of the needs of others. Each pilot had a legitimate right to fly where he was and the Board was aware of the existence of the Lincolnshire Airspace Users Group (LAUG) - a forum for the discussion of issues such as these. Members believed that further dialogue between Syerston and Cranwell might be beneficial.

Evidently the Vigilant pilot had thought that the Dominie was just breaking through cloud IMC when he spotted the jet out to port, but this was

not apparently the case from what the Dominie pilot had reported. The tight manoeuvres of the Vigilant had taken the motor-glider just outside the ATZ where the pilot had been surprised by the sudden appearance of the Dominie off his port wing. Commendably, the Vigilant pilot had checked his 'blind area' and in this converging/overtaking situation the motor-glider pilot had the 'Right of Way'. It would appear from the radar recording and RT transcript that the Dominie pilot had seen the Vigilant at about ½nm away for had he seen it earlier pilot members thought he would have given it a wider berth. The radar recording also confirmed that he had climbed about 200ft to avoid it, leading some members to wonder why he had climbed if he thought it was 700yd (over 1/3nm) away - evidently he was mistaken - as the radar recording showed the tracks merged. As the Vigilant was not fitted with Mode C the minimum vertical separation could not be determined with any certainty. The Board agreed that this Airprox had resulted because the Dominie pilot had flown close enough to cause concern to the Vigilant motor-glider pilot. However, both pilots had seen each other's ac and had taken appropriate avoiding action which led the Board to conclude that no actual risk of a collision had existed here.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Dominie pilot flew close enough to cause concern to the Vigilant motor-glider pilot.

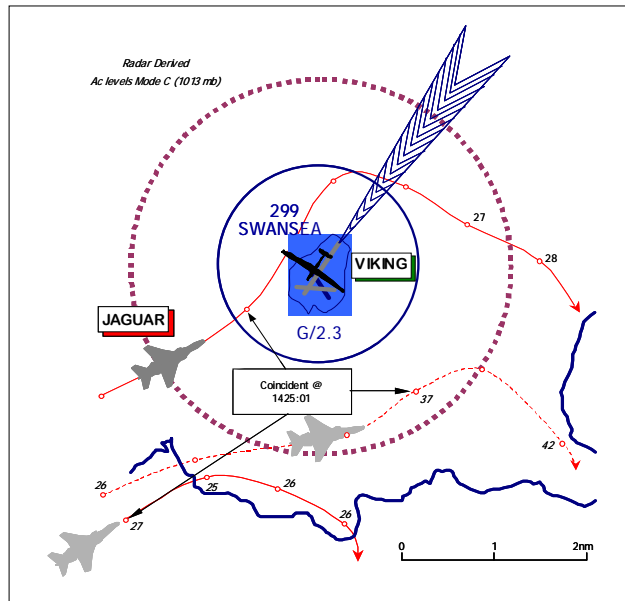
Degree of Risk: C.

Contributory factor: The Dominie crew's late execution of APP's L turn instruction onto 150°.

AIRPROX REPORT No 181/02.

AIRPROX REPORT NO 181/02

Date/Time: 21 Sep 1425 (Saturday)
Position: 5136N 00404W (Swansea Airport - elev 299 ft)
Airspace: Swansea ATZ/FIR (Class: G)
Reporting Aircraft Reported Aircraft
Type: Viking T1 Glider Jaguar GR3
Operator: HQ PTC HQ STC
Alt/FL: 1200ft NK
(QFE 1013mb)
Weather VMC HAZE VMC
Visibility: 6km 10km
Reported Separation:
1500ft H, NK
2-300ft V
Recorded Separation:
NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE VIKING T1 GLIDER PILOT, a solo student, reports that he was in contact with the glider airfield control caravan at Swansea Airport on 129.975MHz. When hdg 220° upwind from the top of launch at 1200ft (Swansea QFE 1013), having released the cable and trimmed the ac to 50kt, a FJ was seen approaching in his 1 o'clock. Before he had time to undertake any avoiding action the FJ, a Jaguar, banked L to increase distance. The FJ passed down his R side, parallel, and with 1500ft H and 200-300ft V separations. He was later informed that a second FJ had passed down his L side but with more separation, although his attention had been focused on the closer of the 2.

[UKAB Note: The Viking Glider was white with, for maximum conspicuity, red dayglow nose and wingtips plus 2 large, orange dayglow patches on each wing upper surface.]

THE VIKING GLIDER PILOT'S UNIT reports that glider launches at Swansea Airport can only be undertaken with prior approval of Swansea ATC. In this instance, not only had the Viking Glider launched but a C152 was also given clearance to take off after the launch cables had been retrieved to the winch. It was at this time that the infringing ac passed through the Swansea ATZ and the

Airprox occurred. The risk of collision has to be assessed as high.

HQ AIR CADETS comments that this was a most unusual occurrence at this civilian airfield. Fortunately it would seem that the Jaguars realised the error of their ways in time to take avoiding action. But the question remains, what were they doing there in the first place? Winch launching at Swansea is a carefully controlled exercise, with emphasis on ensuring the area is cleared before launching.

SWANSEA DUTY ATCO reports that she was the Aerodrome/Approach controller. At 1425 a glider had just released its cable following winch-launch from the RW22 glider strip, and a C152 was on its take off roll. She heard the low rumble of jet engine noise and observed 2 military fighter jets in formation, inside the ATZ heading straight for the glider. The 2 jets then split turning R and L to pass either side of the glider. At this time the glider was between 1400 and 1500ft. The Jaguar that turned R also climbed directly over the field and overflew the climbing C152. She made a general broadcast to warn local traffic, to which an ac on long final responded that there were 2 more jets in the vicinity at approximately 2000ft.

On checking with Cardiff Radar she was advised that there were at least 7 contacts in the vicinity, all showing SSR codes assigned to the 'D School' at Yeovilton; in particular SSR codes 1704 and 1707 could have come from Swansea overhead. A subsequent call from Cardiff warned of jet traffic to the S hdg towards the Swansea overhead. This information was broadcast to local traffic and the gliders were advised to land and stay on the ground until the intentions of the military ac could be established. It was later established that the military ac were working with Yeovilton and in a phone call to Swansea ATC one of the jet pilots admitted he was at 1800ft (unspecified pressure).

UKAB Note (1): 'D School' is the colloquial name for the RN School of Fighter Control, RNAS Yeovilton.

THE JAGUAR PILOT reports his ac was camouflaged grey, that HISLs were selected on and that he was operating as No 3 in a Jaguar 4-ship involved in an evasion training exercise against a Harrier GR7 formation. All ac involved in the exercise were in receipt of tactical information from 'D-School'. As the Jaguar formation crossed the S Wales coast, hdg N, the engagement was terminated and the formation repositioned for another run, N to S, over the Bristol Channel. He was in a RH turn and from his mental air picture was aware that another Jaguar pair was to the W also turning R to reposition S of Swansea. Approaching Swansea Airport heading 045° at 450 kt, he checked that he was above the ATZ (2800ft Rad Alt and climbing), and looked for traffic. He saw a glider being winch-launched at about 1.5nm range and estimated it to be more than 1500ft below. Aware that it could also affect the other ac in his formation, he transmitted an information call about the glider on the formation frequency. Minimum separation distances were 0.5nm H and 1500ft above the glider. He assessed that there was no risk of collision.

THE JAGUAR PILOT'S UNIT comments that this Airprox is unusual in that it occurred during a weekend when FJ flying does not normally take place and glider movements tend to increase. The Jaguar Formation was in Class G airspace and vertically separated from Swansea ATZ, and both pilots' reports imply that there was significant vertical separation between the ac. It is possible that the unexpected presence of the FJs startled the glider pilot and precipitated this report;

however, without a supporting narrative from the reporting pilot, it is difficult to comment in further detail.

THE 'D SCHOOL' FIGHTER CONTROLLER reports that he was working a formation of 4 Jaguars, on frequency 249.725MHz, which was engaged on a 4v4 affiliation sortie with 4 Harrier GR7s. Having conducted a simulated airfield attack at Yeovilton [UKAB Note: As part of a flying display] the Jaguars were assigned Mode 3 codes 1704-7 respectively and placed under a RIS at 3000ft (Wessex RPS 1015mb) for transit to the start point, vicinity 5110N 04W. Once clear of A25 the formation was cleared into the block sfc-24000ft (Wessex RPS 1015mb) with service qualified as FIS below 5000ft. Ac were also informed that they were responsible for terrain clearance. The Harriers pre-positioned in the vicinity of Swansea at 19000ft.

The first fight dragged N towards the Gower Peninsula. Workload was high due to the tactical demands of the scenario (4v4). Fighting was terminated after 6 or 7 min and the Jaguars flowed out S to their pre-briefed start point. Shortly afterwards Swansea ATC called citing an alleged infringement of the Swansea ATZ by a military ac. The Jaguar Formation Leader was advised and in response he advised that he had terminated the fight because of their proximity to Swansea and they had not descended below 2000ft. The sortie continued without further incident.

On completion of the sortie he spoke to Swansea ATC and was advised that the alleged infringement was by an ac squawking 1704.

CinC FLEET comments that the ac involved in this alleged Airprox were engaged in an air combat manoeuvring exercise in Class G airspace over the Bristol Channel from sea level to 24,000ft RPS. A FIS was being provided from sea level to 5000ft and RIS above. It is considered that whilst operating under a FIS below 5000ft responsibility for traffic avoidance was vested with the pilot.

HQ PTC comments that whilst this incident was doubtless alarming to a young, inexperienced cadet, the Jaguars – whilst tactically preoccupied – hauled clear of the ATZ and gave the glider a wide berth. However, a combat package of this size (at a weekend) would surely comprise an

AIRPROX REPORT No 181/02.

Unusual Aerial Activity (UAA) and therefore ought to have been the subject of a NOTAM.

[UKAB Note: A check with the Airspace Utilisation Section reveals no submission was received for the air combat manoeuvring exercise upon which the Jaguars and Harriers were engaged. Consequently no UAA NOTAM was issued.]

HQ STC comments that enquiries into the disparate accounts of this Airprox revealed that the Jaguar pilot who responded to the initial report was squawking SSR code 1706; this was not the Jaguar closest to the glider. The pilot squawking 1707 (No 4), however, admitted to being over-involved in defending against the Harrier attacks and getting too close to Swansea. As a consequence he admits that he probably infringed the ATZ due to poor awareness of his position in very hazy visibility. He executed a late turn and climb to avoid the ATZ but most likely he was at the positions stated by the Viking pilot and Swansea ATC. The clear lessons here are to maintain greater situational awareness, knock off the fight earlier, if it is pushing you close to conflicting airspace, and do not manoeuvre in the haze – climb above.

UKAB Note (2): Analysis of the RTF transcript reveals that:

At 1410:01 D School controller transmits “C/s cleared in the block sfc to 24000ft on the Wessex regional 1015, FIS below 5000ft. You are reminded you are responsible for terrain clearance.”

At 1417 in response to a request to confirm base height 5000ft the Jaguar Leader states “There’s some confusion in the planning phase. We were going to be working in the block 0-4s standard affil rules, not repeat not DACT with a base height 5000ft.” The D School controller replies that he has relayed the information to the other [Harrier] controller and they [the Harriers] are discussing the options. The Jaguar Leader then advises, at 1418:55, that he would talk to the Harriers on their frequency.

At 1419:36 the Jaguar Leader advises the D School controller “Working below 5000ft, probably running in 0-4 block low level” to which the D School controller responds “C/s ... understand the

problem has been resolved and you are cleared in the block as briefed.”

At 1426:05 [after the reported encounter] one of the formation transmits “At 3000ft on 1019.”

UKAB Note (3): Met Office archive data reveals that:

a. Cardiff METARs 1350 211350Z 16004KT 120V200 9999 FEW035 BKN050 16/08 Q1020=

1420 211420Z 16003KT 9999 FEW030 BKN050 16/08 Q1020=

The 1400 – 1500 Wessex RPS for was 1016mb.

UKAB Note (4): UK AIP AD2-EGFH-1-2 promulgates the Swansea ATZ as a “Circle radius 2nm centred on longest notified runway (04/22) 5131619N 0040404W. Vertical limits SFC-2000FT aal.”

UKAB Note (5): UK AIP ENR 5-5-1-5 promulgates Swansea as a Glider Launching Site “By winch/ground Tow and tug aircraft/motor glider with vertical limits 1500ft agl, site elevation 299ft amsl and active sunrise to sunset.”

UKAB Note (6): Analysis of the Burrington recorded radar data, which provides SSR data only, does not show the reported encounter as the Viking was not equipped with an SSR transponder. Nevertheless, it shows an SSR Mode 3/A code 1704 return, a Jaguar, hdg N. This coasts in 3.6nm SW of Swansea Airport, at 1424:03, displaying 013 on Mode C. Four returns, identifiable from D School-assigned Mode 3/A SSR codes 1701-3 and 1710 as the Harrier GR7 formation, coast in SSW of Swansea Airport before commencing a climbing RH turnabout onto S; for clarity these are omitted from the diagram. They pass over the E boundary of Swansea Airport displaying Mode C between 071 and 086. Meanwhile at 1424:19 a Mode 3/A SSR code 1707 return, another Jaguar, also hdg N coasts in 5.9nm SW of Swansea Airport; this displays 017 on Mode C. Both Jaguars turn NE towards Swansea Airport, the first – SSR code 1704 - passing to the S and E and the second – SSR code 1707, the reported Jaguar, to the W and N. Mode C of the first displays 026 on the penultimate sweep before it crosses the ATZ boundary and 037, at 1425:01, before it clears the

ATZ to the E suggesting that this ac was above the ATZ. Unfortunately no further Mode C is displayed on the second after it coasts in until 1425:30, when it displays 027, just before the ac crosses the ATZ boundary outbound. Thus recorded data does not show if the ATZ was infringed. Nevertheless, it would appear that the reported encounter occurred at about 1425:01, at which time the Jaguar is in a L turn as reported by the Viking pilot. Whilst the Jaguar pair overflies Swansea Airport, the other 2 Jaguars are in a R orbit to the S. One – SSR code 1706 - turns towards Swansea Airport approaching from the SW at 1425:01, although it remains to the S of the ATZ. All ac subsequently coast out to the S, although the Harriers turn back towards Swansea Airport in a R spiral climb.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information included reports from the pilots of both ac, transcript of the relevant RT frequency, radar video recording, a report from the air traffic controller involved and reports from appropriate operating authorities.

The HQ STC representative explained that events surrounding this incident had required some unravelling to reveal the true situation. Despite a

response by one of the Jaguar formation pilots to the initial Airprox report, it was only through the assigned D School SSR codes that correct identification of the reported Jaguar was enabled. He also conceded that the activity upon which the Jaguars were involved constituted an UAA and therefore should more properly have been the subject of a NOTAM. Members noted the assertion of the Swansea ATCO that 2 Jaguars had infringed the ATZ, which would have been based on visual judgement alone. Radar data, however, suggested that only one ac, the reported Jaguar, had actually infringed. This, members agreed, had been the cause of the Airprox, although they were not unanimous as to the degree of risk. Some thought that safety had been compromised, although the majority determined that, because the Jaguar pilot had seen the Viking glider and turned away, this had been enough to remove any risk of a collision.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Inadvertent penetration of the Swansea ATZ by Jaguar No 4, whose pilot flew into conflict with the Viking glider.

Degree of Risk: C

AIRPROX REPORT No 182/02.

AIRPROX REPORT NO 182/02

Date/Time: 21 Sep 1321 (Saturday)

Position: 5147N 0056W (O/H Aylesbury/
Thame G/S - elev 289 ft)

Airspace: FIR (Class: G)

Reporting Aircraft Reported Aircraft

Type: ASK13 Glider R3000

Operator: Civ Club Civ Pte

Alt/FL: 1150ft↑ 2500ft

(QFE 1009mb) (QNH)

Weather VMC CLBC VMC NK

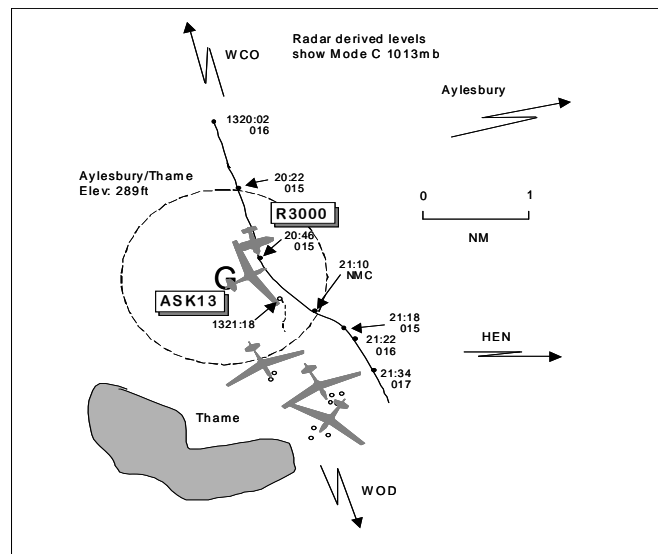
Visibility: 10km

Reported Separation:

50ft V 150ft H 0.5nm H

Recorded Separation:

not recorded



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE ASK13 GLIDER PILOT reports heading 060° at 60kt climbing on a winch launch from Aylesbury/Thame Gliding Site. The visibility was 10km 2000ft below cloud in VMC and the ac was not equipped with a radio. Approaching the top of the launch at 1150ft QFE 1009mb, he spotted a grey coloured low wing single engine ac late in his 10 o'clock range 150m just above his level. He immediately released the cable and lowered the ac's nose as the other ac was seen to execute a steep L turn, passing 50ft above and 150ft ahead of his track, before it turned back to the S once clear of 3 other airborne gliders. He opined that the risk of a cable strike had been significant as the other ac had transited overhead the active site.

THE ROBIN 3000 PILOT reports flying VFR from Turweston to Biggin Hill via WCO and WOD NDBs at 2500ft, he thought, and he was not in receipt of an ATS. The weather was 'good' VMC and he was squawking 7000 with Mode C. Having flown the reciprocal leg earlier that morning and flown well to the E of the Aylesbury site which was not active at the time, he decided to approach the site more closely on the return leg before deciding if a deviation was necessary. With about 2nm to run, he noticed numerous gliders ahead and, although perhaps a little late, executed a steep turn to

deviate (in a U shape pattern) around the site whilst maintaining visual contact with the airborne gliders before regaining course. Neither he nor his passenger was unduly concerned as the gliders were observed flying at various heights, above and below his level, but not in such close proximity as to appear dangerous. The nearest glider passed about 0.5nm away and he believed that this had not constituted an Airprox.

UKAB Note (1): During a subsequent telephone conversation with the R3000 pilot, he confirmed that he had not seen the wire-launching glider during his transit of the Aylesbury area.

UKAB Note (2): The UK AIP at ENR 5-5-1-1, promulgates Aylesbury/Thame as a Glider Launching Site centred 514633N 0005625W for winch launches where cables maybe encountered to 2000ft agl, during daylight hours; site elevation 289ft amsl.

UKAB Note (3): Met Office archive data shows the QNH in the Aylesbury area as 1019mb.

UKAB Note (4): The Airprox, as described by the reporting ASK13 pilot, is not seen on recorded radar. Analysis of the Heathrow radar recording at 1320:02, clearly shows the R3000 1.7nm N of

Aylesbury/Thame Glider Site tracking 165° indicating FL016 (1780ft QNH 1019mb) with 3 intermittent primary contacts, believed to be other gliders known to be airborne from Aylesbury/Thame, manoeuvring ahead of its track ranging between 2.8-3.7nm. The R3000 is seen to continue on a steady track, until passing 0.3nm NE abeam of the Glider Site, at 1320:46, now at FL015 (1680ft QNH). Immediately thereafter the R3000 is seen to commence a L turn, steadying on track of 100° until fading for one radar sweep after 1321:10, when NMC is evident. The R3000 reappears at 1321:18, 1.2nm SE of Aylesbury/Thame indicating FL015 in a R turn, when a primary only return, believed to be the reporting ASK13 Glider, pops-up 0.5nm SE of the Glider Site tracking 165° 0.67nm NW of the Robin and just to the W of the Robin's radar trail history. The R3000 rolls out onto a track of 165° 16 sec later at 1321:34, now level at FL017 (1870ft QNH) and passes approx 0.5nm E of the nearest primary contact observed of the 3 other gliders soaring to the S of the airfield. The ASK13 pilot's reported height, at the time of the incident, of 1150ft QFE 1009mb equates to 1439ft amsl.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members were highly critical of the airmanship displayed by the R3000 pilot. Having flown past Aylesbury/Thame earlier in the day and not seen any activity, he had then intentionally approached the site on the return leg (situated on the direct track WCO - WOD) seemingly being prepared to deviate off-track if required. A number of learning points could be extracted from these actions. First, the gliding site was promulgated as being active so should have been given a wide berth, even if activity could not be seen from the air.

Second, as seen during this encounter, the gliders already airborne and observed by the R3000 pilot, were operating S of the site so his avoiding turn had been executed too late, as he overflew the gliding site. Third, his track invited conflict with any winch launching glider, which is exactly what happened and had caused the Airprox. Finally, he never saw the glider. However, it was felt that the ground launch party should have seen the approaching R3000 during their last look checks immediately prior to the launch. Members believed that by not detecting the potential conflict, the ground party had contributed to the incident.

The risk of a cable strike in these situations cannot be over-emphasised and is a salutary lesson to be learnt. Although the ASK pilot did well to spot the conflicting traffic and had terminated the launch as the R3000 passed 50ft above and 150ft ahead, the R3000 pilot had been oblivious to the danger as he flew through the site below the promulgated maximum cable release height. His turn, in response to seeing the other gliders ahead, was purely fortuitous and had marginally increased the separation distance. Members felt that the glider pilot's prompt actions of releasing the cable and lowering his nose had removed an actual risk of collision but the situation had been one where the safety of both ac had been compromised.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The R3000 pilot flew through a notified gliding site into conflict with a winch-launching glider, which he did not see.

Degree of Risk: B

Contributory Factors: The Ground Launch Party did not detect the approaching R3000.

AIRPROX REPORT No 183/02.

AIRPROX REPORT NO 183/02

Date/Time: 24 Sep 1433

Position: 5151N 0359W (15nm N of Swansea)

Airspace: UKDLFS - LFA7 (Class: G)

Reporting Aircraft Reporting Aircraft

Type: Tornado GR4 Hawk

Operator: HQ STC HQ PTC

Alt/FL: 450ft agl 250 ft
(Rad Alt) (msd)

Weather VMC CLOC VMC CLOC

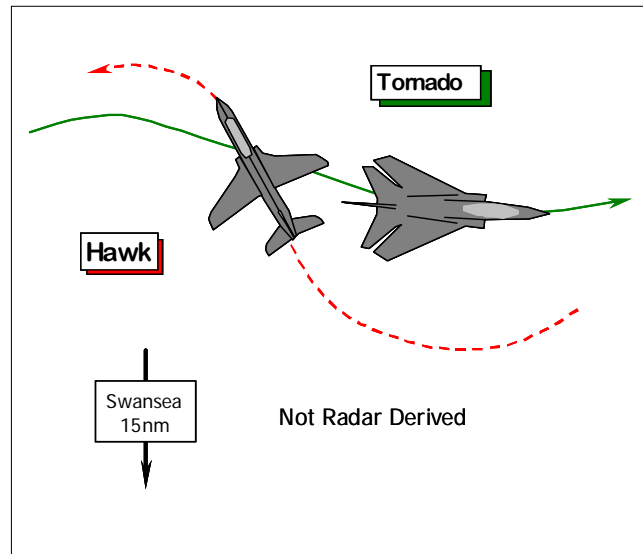
Visibility: 30km+ 40km+

Reported Separation:

100ft H, 100ft V 100m H, nil V

Recorded Separation:

Not recorded



BOTH PILOTS FILED

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE TORNADO GR4 PILOT reports that he was leading a pair of camouflage grey GR4s on a low level training sortie in LFA7 at 408kt, with his No2 flying to port. HISLs and navigation lights were on; A7001 with Mode C was selected, but neither TCAS nor any other form of CWS is fitted. Whilst descending at 3°, in a R turn passing through 103° at 450ft msd, a black Hawk ac was sighted late in the 2 o'clock position about 500ft away at the same height. The Hawk appeared to be in an "aggressive" climbing turn to port, and although an instinctive full control input aft and left was made to avoid it, the Tornado's flight path was not materially altered before the Hawk passed 100ft above and 100ft astern. A warning call was made to his No2 who then saw, what he erroneously thought at the time was a second Hawk ac, pass 1-200ft close above the lead Tornado in a straight and level attitude. He assessed the risk of a collision as "high".

THE HAWK PILOT, a QFI, reports that he was conducting a low level navigation training exercise at 420kt, flying at 250ft msd with a student pilot in the front seat as the PF. The Hawk was coloured black and the HISLs and nose landing light were on; A7001 with Mode C was selected but neither

TCAS nor any other form of CWS is fitted. The crew was listening out on the LFS frequency. The ac had just rolled out of a planned turn on to a heading of 329° about 1nm SW of Llandeilo, when the front seat student PF called 'Tally' on a Tornado spotted 500m away and initiated a hard left turn. He looked ahead to see a Tornado crossing left to right "on the nose" about 100m away. The Hawk passed behind the Tornado at the same height, flying through its wake with a "high" risk of collision.

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

THE TORNADO PILOT'S UNIT comments that this was an unfortunate incident in Glass G airspace showing the importance of the "see & avoid" principle. A late "spot" by the lead Tornado pilot did at least give sufficient time to warn his wingman. The fundamental message to all is LOOKOUT.

THE HAWK PILOT'S UNIT comments that this Airprox highlights the need for effective lookout, clearing turns and possibly an awareness of areas obscured by canopy arches or other obstructions.

This incident happened when the Hawk crew did not see the approaching Tornado on an almost reciprocal heading and carried out a pre-planned navigation turn to produce a confliction that was only resolved when the Hawk student PF took violent avoiding action. It would appear that none of the crews spotted the other ac until it was almost too late. The prominent canopy arch in both front and rear cockpits may have been a factor in visually acquiring the other ac.

Station aircrew have been reminded of the need for adequate lookout and of the requirement to clear turns adequately especially in the demanding and high-workload, low-level environment. We are currently also advising crews to make every effort to ensure that the airspace hidden by cockpit obstructions receives as much attention as possible.

HQ STC endorsed the comments of the Unit Flight Safety Officers; that lookout is the primary task when low flying. Unfortunately, we are still waiting for industry to invent an operationally viable CWS for fast jet ac, since funding for the pursuit of a CWS for the Hawk and GR4 has been approved.

HQ PTC comments that this seems to be a not uncommon encounter in the UKDLFS, resolved by both pilots - but with no great margin for error. Apparently, there was not a second Hawk in the area. We can only suggest that the lead Tornado pilot called the Hawk rather earlier than he had thought and what his No2 saw was the incident itself. Another Airprox which supports the case for a CWS.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board commended both pilots for their very frank and honest accounts of what was, in the Board's view, a difficult close quarters situation. It seemed that the camouflage grey of the Tornado and the black colour scheme of the Hawk against the terrain had effectively masked the presence of these ac from each other's crew. The Hawk's supposedly high conspicuity paintwork was, contrary to popular belief, not as conspicuous as

many would think. A fast jet pilot member emphasised that contrast was the key and here it had not been enough to make the small black jet against the dark background terrain obvious to the descending Tornado crew. That said, black is generally taken to be the best compromise overall. Similarly, the Hawk's nose-light – so often mentioned by other pilots as the first thing to attract attention to the small jet's presence - had provided no additional warning. Instead, the close to head-on aspect, the small cross-sectional area of the Hawk and absence of significant relative motion all made it invisible to the Tornado crew until, it would appear, the movement associated with the "aggressive" climbing turn to port had caused them to spot it – but effectively too late to move out of the way. The GR4 pilot's "instinctive full control input aft and left" had not had any effect on the situation as the Hawk passed above and behind. This had been effectively a non-sighting - and part of the cause. However, from the front cockpit of the Hawk the student pilot had managed to detect the larger jet in time – perhaps skylined as it descended from above – which enabled him to initiate a hard left turn to pass astern at the same level through the GR4's wake. The Board commended the student for his prompt reaction as the QFI was unsighted until the jet was 'on the nose', but it was evidently a very late sighting by the former and the other part of the cause.

Discussion turned to the inherent risk in this encounter. Some pilot members suggested that the Tornado crew had little impact - if any - on the outcome and the Hawk student's robust avoiding action was at best an instinctive reaction, leading to an actual risk of collision. Others contended that the student pilot had sufficient time to call out the sighting to the QFI as he pulled and turned. Either way reactions certainly needed to be swift; if the 500m sighting range was accurate, then closing speeds in the order of 800kt meant the distance would have been eroded in less than 1sec, so the avoiding action was probably barely enough to avert an actual collision. Though not a unanimous decision, it was agreed by most that although the student's action had been just enough to manoeuvre his ac clear and remove the risk of an actual collision, the safety of the ac involved had been seriously compromised.

The absence of any other aid to the crew's lookout engendered debate about the acquisition of a

AIRPROX REPORT No 184/02.

CWS for fast-jets - a hot topic in previous UKAB considerations of encounters in the LFS. The DASC advisor explained that funding had been allocated for fitment of a CWS to the Tornado GR4 fleet, but this project was still at the inception stage. Though there is ample evidence that the technology can be made to work very successfully in the commercial sphere, considerable development was needed before a fully integrated system could be made to work in the low-level fast-jet environment. It was not thought feasible to produce a viable system in the near future and the Board was briefed that it was not intended to fit the

F3 AD fleet or Typhoon at this stage, nor the GR7. The Board was not encouraged by this information.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Effectively, a non-sighting by the Tornado crew and a very late sighting by the Hawk crew.

Degree of Risk: B.

AIRPROX REPORT NO 184/02

Date/Time: 24 Sep 1634

Position: 5221N 0007W (O/H Wyton
- elev 135 ft)

Airspace: London FIR (Class: G)

Reporting Aircraft Reported Aircraft

Type: C172 PA32

Operator: Civ Club Civ Pte

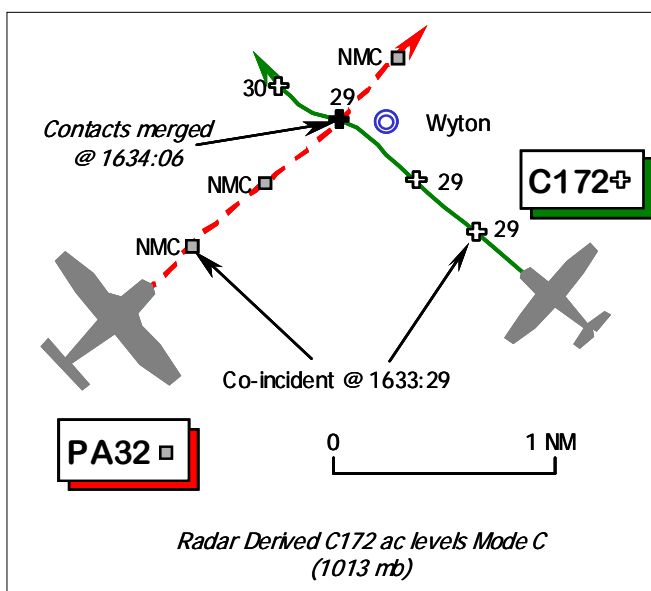
Alt/FL: 3100ft 3000ft
(N/K) (QNH 1025mb)

Weather VMC CLBC VMC CLBC

Visibility: 15km [into sun] >10km

Reported Separation:
100ft V, nil H 50ft V, 300ft H

Recorded Separation:
Nil H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE C172 PILOT, a flying instructor, reports he was in transit from Newmarket Heath to Derby with a passenger in the LHS, so he was flying the ac from the RHS. His ac has a blue & white colour scheme and all the ac's lighting, including the landing lamp, was on.

Although outside their operating hours, he had called Wyton but received no reply, so he elected to contact Cottesmore ZONE on 130.2MHz, and was squawking their assigned code with Mode C. As the visibility was good down sun but poor into the bright sun, he had requested a RIS from

ZONE; it was evident to him that the controller was busy. Overhead Wyton, heading 310° at 105kt, in level cruise at 3100ft, his LHS passenger first spotted the other ac at 9 o'clock about 400m away just before it passed below. However, by the time he saw it, the PA32 passed from being 100ft directly below (from L – R into his 4 o'clock) to about 300m away, flying at right angle to his heading. A report was made to Cottesmore straight away, but he did not receive a reply. After he had repeated his message he received an acknowledgement from ZONE, but almost 10 min elapsed before he passed the full details to the

controller because of the latter's workload. Although no avoiding action was taken because there was no further necessity after the PA32 had passed below, he assessed the risk of a collision as "high". Although he believed his lookout was good, he emphasised that flying the ac from the RHS had been a relevant factor to his passenger sighting the PA32 before he did.

THE PA32 PILOT reports he was flying alone from Wiltshire to East Winch, Norfolk, in good visibility about 1000ft below cloud. The ac colour scheme is white with red & blue trim and the red anti-collision beacon was on. He was in receipt of a FIS from Lakenheath on 128.9MHz, and was squawking the assigned code with Mode C selected on, he thought.

Heading 060°, just to the NE of Wyton at 130 kt, in level cruise at 3000ft QNH, he spotted the C172 at R 1 o'clock - about 500ft away and 50ft above his ac. He made a gentle L turn to avoid the Cessna which passed 300ft to starboard and 50ft above his ac with a "medium" risk of collision. Although the distances involved were relatively small, he did not regard this occurrence as "a collision situation" so a gentle L turn was all that was required to increase the separation between both ac. However, he expressed surprise at the late visual acquisition of the other ac in such good weather conditions. As he had been in contact with Lakenheath RADAR he was very surprised that he had not received a warning from ATC. After the encounter he asked if they had had a contact in his 1 o'clock and the controller indicated that she had seen something on her screen. No explanation was given as to why no comment was made before the occurrence.

MIL ATC OPS reports that the C172 pilot free-called Cottesmore ZONE for a "...Radar Information Service" at 1629:55. A squawk of A4631 was assigned and the C172's altitude confirmed at 3000ft. The C172 was identified at 1631:29, 5nm SE of Wyton and the pilot instructed to set the BARNSELY RPS (1022mb) followed thereafter at 1631:45, with a limitation of service and traffic information "[C/S] limited traffic information from all around due to base & edge of radar cover, **traffic left 10 o'clock 5 miles crossing left right no height**" - the subject PA32. This was acknowledged by the C172 pilot "Limited RIS looking...". Thereafter, ZONE gave virtually continuous calls to other ac. At 1634:24, the C172

pilot called ZONE to advise that he would "...like to file an Airmiss" (sic) but he was initially instructed to standby. Details of the Airprox were passed at 1641:59, the delay caused by a series of transmissions to other ac and a significant amount of traffic information about other flights to the C172 pilot. Although ZONE attempted to hand over the C172, the flight was eventually free-called to East Midlands at 1655:35.

The PA32 pilot free-called Lakenheath RADAR APPROACH CONTROL (RAPCON) at 1624:30, was assigned a squawk of A0456, but as a result of controller workload further flight details were not obtained until 1628:29, when RAPCON confirmed "...radar contact 35 miles southwest of Lakenheath...". The Lakenheath QNH of 1025mb was given to the PA32 pilot by RAPCON, the flight placed under a FIS and further details requested, whereupon at 1628:39, the PA32 pilot reported he was flying VFR to East Winch at 3000ft QNH (1025mb) and acknowledged the FIS. Thereafter a continuous stream of RT calls to different ac followed until 1633:54, when the PA32 pilot asked RAPCON "...do you have a contact in our...1 o'clock", whereupon the controller confirmed at 1634:03, "...indicating 3200 [feet] I have no primary target on him".

The PA32, squawking A0456, is shown on the Debden radar recording at 1629:32, 9nm southwest of Wyton heading northeast, but no Mode C is evident at all throughout the period of the Airprox. One min later the C172's squawk is observed to change from A7000 to A4631, 5.5nm southeast of Wyton. At 1631:45 - when the C172 was identified by ZONE - traffic information was also passed, but the PA32 was L 10 o'clock at 6-7nm, not the reported 5nm. The 2 ac remain on a constant relative bearing as they converge and constitute a definite hazard.

JSP318A Regulation 235.125.1 states that under a FIS, although it is desirable for a controller to issue a warning to a pilot if it is considered that the flight is in "...dangerous proximity to another aircraft" it is accepted that the controller "...cannot assume responsibility for its issuance at all times...". RAPCON was busy with RT and landline co-ordination for ac inbound to Lakenheath, so it is understandable that the PA32, under FIS, was low on the controller's list of priorities. Although Lakenheath RAPCON did not advise the PA32 pilot about the C172 in his vicinity

AIRPROX REPORT No 184/02.

under the FIS that pertained, this has little bearing on the incident.

Following a trial to investigate the feasibility of providing a LARS by Cottesmore out to a range of 40nm, it was discovered that there was inadequate radar coverage in the area. Consequently, ZONE could have refused to provide a radar service to the C172 pilot here, but helpfully elected instead to provide a correctly 'limited' RIS; although the range information given was slightly inaccurate (understandable at 36nm from the radar head) the PA32 was called to the C172 pilot in good time. During this period the Cottesmore SUPERVISOR had advised ZONE to start to 'off-load' tracks prior to combining the two positions and handing the ZONE frequency to APPROACH. It is evident that ZONE's attention was drawn to this task. Nevertheless, JSP318A 235.115.1, states that controllers will *"...only update details of conflicting traffic...at the pilot's request or if the controller considers that the conflicting traffic continues to constitute a definite hazard"*. It is evident from the radar recording that the latter was the case and that ZONE should have provided further traffic information to the C172 pilot about the conflicting PA32. Although ZONE was operating at the limits of his radar cover the controller could have re-called the PA32 to the C172 in the 2½ minutes between his initial call and the Airprox, if he had prioritised his tasks correctly. Just one more call may have alerted the C172 to the potential danger, however only the pilot was aware of his in-flight conditions; as he reports the visibility flying into sun was poor he could equally have requested an update on traffic information about the previously reported PA32.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board noted from the C172 pilot's laudably frank and honest account that he had sensibly obtained the benefit of a RIS from Cottesmore to supplement his visual lookout in the weather conditions that pertained here. For their part, Cottesmore ZONE had promptly provided traffic information to the C172 pilot about the PA32 when

it was about 6-7nm away – as affirmed by the Mil ATC Ops report. This was a crucial call that should have helped the C172 pilot acquire the other ac visually. However, a GA pilot member explained that the view cross-cockpit in the C172 is poor, which probably frustrated the pilot's visual search for the PA32 and evidently the other ac was not visible to him, from the RHS, until it emerged underneath opening away to starboard. Thus it was no surprise that his passenger saw the other ac first – an unfortunate consequence of flying in the RHS. Thus, effectively blind to the other ac, the C172 pilot was prevented from taking effective avoiding action and the Board concluded that this non-sighting was part of the cause. The Board noted that there may have been an opportunity for ZONE to pass an update on the traffic information, which might have emphasised this parlous situation. However, the PA32 was not displaying Mode C information although the pilot had reported it had been selected on; the equipment might have been unserviceable, or, he may have been mistaken in thinking he had switched it on. Whichever, it was not evident on the radar recording and had prevented the controller from including the ac's level within the traffic information transmitted to the C172 pilot – an essential element crucial to alerting pilots about other ac at close quarters. This was an important lesson that was worth reiterating; the Board strongly endorsed the selection of Mode C SSR altitude reporting all the time the transponder was on and controller members stressed the value of Mode C for the provision of complete traffic information.

Clearly, both ATSU's had been operating with traffic in airspace that was particularly busy. However, it was not entirely clear whether the PA32 pilot had asked RAPCON whether they could see the C172 on their radar, actually during the encounter, or afterwards. From the RT transcript it appeared as though he had queried this before the encounter at 1633:54, when the PA32 pilot asked RAPCON *"...do you have a contact in our...1 o'clock"* - phrasing his question in the present just before the contacts merged at 1634:06. Whereas he reported subsequently that he asked the question after the event. Inaccurate time references from the recordings may have confused matters, but it was important to understand that under the FIS that pertained, there was no compunction on the part of Lakenheath RAPCON to provide traffic

information about the converging C172. However, controller members stressed that it was good professional practice to provide such warnings if the traffic scenario and the controller's workload/priorities permitted – here, it would appear, they did not. Consequently, in the see and avoid environment of the 'Open FIR' it was very much up to the pilots involved to maintain a lookout and avoid each other's ac in accord with the 'Rules of the Air'. The PA32 pilot, who was required to give way in this situation, had sighted the C172 late - 500ft away and 50ft above his ac; late detection was probably the result of the white colour scheme of the C172, closing on a constant relative bearing from starboard with little movement to attract attention to it – and across the cockpit from his perspective. This was, on any account, a late sighting and the Board agreed unanimously that this was the other part of the cause.

Turning to risk, the unsighted C172 pilot had done nothing to effect the outcome of this encounter. At

these speeds, the PA32 pilot's horizontal sighting distance of 500ft was covered in about 2-3 secs, leaving little time for him to change his flight path and manoeuvre his ac out of the way of the other. Nevertheless, he was not apparently concerned at this occurrence and said he had time to make a gentle L turn to pass 300ft ahead of the C172. The radar recording showed that the contacts had merged. Moreover, the reported 50-100ft of vertical separation was, in the Board's view, too close and left no margin for error, such that the members concluded unanimously that the safety of the subject ac had been compromised in the circumstances reported here.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A late sighting by the PA32 pilot, and a non-sighting by the C172 pilot.

Degree of Risk: B.

AIRPROX REPORT NO 185/02

Date/Time: 22 Sep 1819 (Sunday)
TWILIGHT

Position: 5116N 0026W (3nm SSE OCK)

Airspace: CTA (Class: A)

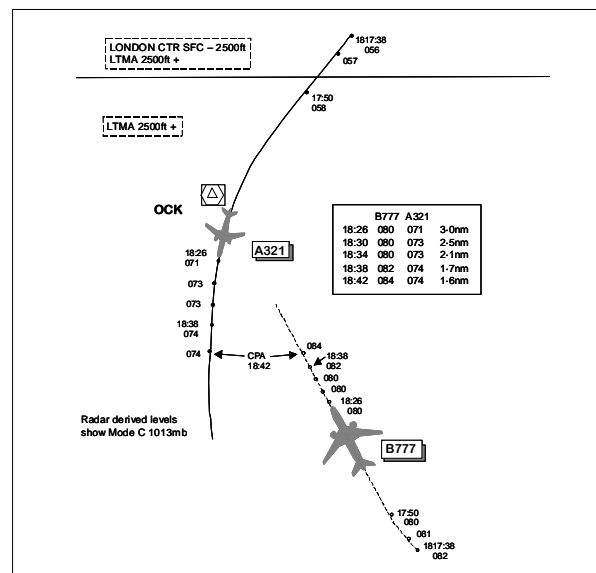
<u>Reporting Aircraft</u>	<u>Reported Aircraft</u>
<u>Type:</u> B777	A321
<u>Operator:</u> CAT	CAT
<u>Alt/FL:</u> FL80	↑FL130

Weather VMC CLOC VMC CLOC

Visibility: 30km >10km

Reported Separation:
400ft V 0.5nm H 1000ft V 2nm H

Recorded Separation:
800ft V 1.7nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE B777 PILOT reports heading 330° at 220kt returning to OCK at FL80 as instructed by Heathrow on 134.97MHz. With about 5nm to run, a TCAS TA was received which aided him in

visually acquiring traffic ahead; shortly thereafter TCAS gave an RA "climb" instruction which he followed whilst informing ATC. The other ac

AIRPROX REPORT No 185/02.

passed 400ft below and 0.5nm horizontally to his L and he assessed the risk of collision as medium.

THE A321 PILOT reports heading 210° at 300kt outbound from Heathrow and in receipt of an ATS from London on 134.12MHz. He acknowledged instructions to turn L heading 180° and to climb to FL130, which he later found had been addressed to a company ac with a similar flight number also on frequency. As the readback went unchallenged, he commenced the climb and turn but shortly thereafter heard TCAS enunciate "traffic"; he quickly acquired the other ac visually at about 3nm range. An RA alert ensued and by stopping the banked turn and following the RA guidance, the alert ceased after a few seconds. The other ac was seen to pass clear to his L by 2nm and 1000ft vertically above. There had been no perceived risk as the situation had been fully under control at all times.

ATCI LTCC reports that the TC OCK/WILLO sector was bandboxed with the SC dealing with outbounds from both Heathrow and Gatwick using cross-coupled RT frequencies of 134.12MHz and 133.17MHz. Traffic loading was high.

The A321 (c/s XYZ4139) had departed Heathrow on a SAM SID and, following its initial call, the SC had told it to squawk ident and had removed the ATC speed restriction. He did not climb the A321 above 6000ft because of the subject B777, which was in the OCK hold descending to FL80, under the control of the Heathrow INT S controller.

A few minutes earlier, at 1814, another ac (AC3 c/s XYZ4147) had departed Gatwick RW08R on a SFD SID and had called on 133.17MHz at 1817:15. When it was clear of other traffic, the SC had instructed AC3 to climb to FL130 on heading 180°. This instruction was acknowledged by the subject A321 (XYZ4139) at 1817:40 as follows "*one three zero and er one eight zero degrees c/s prefix four one th- er ???? three nine*". [UKAB Note (1): A part word "th-" is shown on the RT transcript and one unintelligible word ????]. Although hesitant the reply was quite clear but unfortunately the SC did not detect the incorrect readback. No reply from AC3 (XYZ4147) can be heard on any of the RT recordings, but the radar replay shows that it did obey the instruction. At this time the B777 was returning to OCK to commence an approach to RW09L.

The A321 turned onto 180° which took it closer to the track of the B777 and, at 1818:26, separation fell below 1000ft. A few seconds later (1818:30) the B777 reported to the Heathrow INT S Director that it was climbing in response to a TCAS RA. The DIR gave TI and asked if the traffic was in sight, receiving an affirmative reply. Meanwhile STCA had activated at 1818:41 which attracted the OCK/WILLO SC's attention to the conflict. Before he could take any corrective action the subject ac had passed and separation was increasing, so all that he could do was to take such action as necessary to ensure that no further conflicts occurred.

[UKAB Note (2): The radar recording shows that after standard separation was lost, both vertical and horizontal distances decrease. The next radar sweep (1818:30) shows the B777 maintaining FL80 2.5nm SE of the A321 indicating FL73. The A321 levels at FL73 on the next sweep whilst the horizontal separation has decreased to 2.1nm. 4 sec later (1818:38), the B777 commences its climb in response to TCAS, indicating FL82, with the A321 in its 10 o'clock range 1.7nm now showing FL74. Separation is restored on the next sweep (1818:42) as the ac pass abeam range 1.6nm 1000ft apart.]

Recommendation

The GM LTCC should ask SRG to approach the A321 operator to urge them to adopt a trip number format which reduces the probability of ac operating at the same time having callsign suffixes which commence with the same 2 or 3 numbers.

[UKAB Note (2): Another ac from the same company was also on frequency c/s XYZ4143 although it played no part in this incident.]

This recommendation has been accepted by GM LTCC.

ATSI endorsed 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 wondered whether the frequency 'cross coupling' system had played a part in the incident. The A321 and AC3 were on separate frequencies on the bandboxed sector when the SC issued a climb and turn instruction to the crew of AC3. Whilst both ac complied with the instruction, the OCK/WILLO SC only heard a read-back from the A321 crew whose c/s did not register. The NATS advisor informed members that further investigation (listening to the frequencies independently) confirmed that no transmission had been recorded from AC3. It was thought unlikely that the transmission had been lost in the RT system and also inconceivable that the crew of AC3 would follow the ATC instruction without an acknowledgement. One theory put forward was that the AC3 crew may have replied inadvertently on the PA system, not the RT, by mistake as the RT and PA normally utilises the same PTT switch but with different selection modes. If so, the crew would have heard the sidetone feedback in their headsets as normal but the transmission would not have been broadcast outside the confines of the airliner cabin. Although feasible, this explanation was a matter of supposition and the 'lost transmission' issue remained unresolved. What was clear, however, was that the subject A321 crew had responded erroneously to the SC's instruction addressed to AC3; this had been a part cause of the Airprox. CRM/flight deck procedures within the A321 cockpit should have picked up the fact that the SC's transmission was not addressed to their ac. Following on from this, the SC did not detect the incorrect c/s within the read-back by the A321 crew, which had been a second part cause. As the Airbus crew response had then gone unchallenged, they had commenced the turn and climb which had put

them into potential conflict with the B777. There was no doubt that the use of near identical callsigns by the same company had been a contributory factor to the incident.

After the pilot/controller RT exchange (safety net) had been breached, TCAS had alerted both crews to the collision warning. The B777 crew had reported, to the Heathrow INT DIR, carrying out a TCAS RA climb, visually acquiring the A321 after receiving TI, which was seen to pass 400ft below and 0.5nm to the L. The A321 crew had complied with the RA alert they had received and first saw the B777 about 3nm away, watching it pass 2nm clear to their L and 1000ft above. By the time STCA activated, the sting had already been taken out of the scenario and too late for the SC to take any corrective action. However, the prompt actions by both crews to the TCAS guidance combined with their visual sightings was enough to persuade the Board that any risk of collision had been effectively removed.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause:

- a. The A321 crew responded to an instruction addressed to another ac with a similar callsign.
- b. Undetected read-back error by the TC OCK/WILLO SC.

Degree of Risk: C

Contributory Factor: The use of near identical callsigns by the same company.

AIRPROX REPORT No 186/02.

AIRPROX REPORT NO 186/02

Date/Time: 25 Sep 1421

Position: 5255N 0022W (7½nm SE of Cranwell - elev: 218ft)

Airspace: Lincolnshire AIAA (Class: G)

Reporting Aircraft Reported Aircraft

Type: Harrier GR7x4 Grob Tutorx2

Operator: HQ STC HQ PTC

Alt/FL: 2250ft 2000-2500ft
(RPS 1016mb) (RPS)

Weather VMC CLBC VMC CLOC

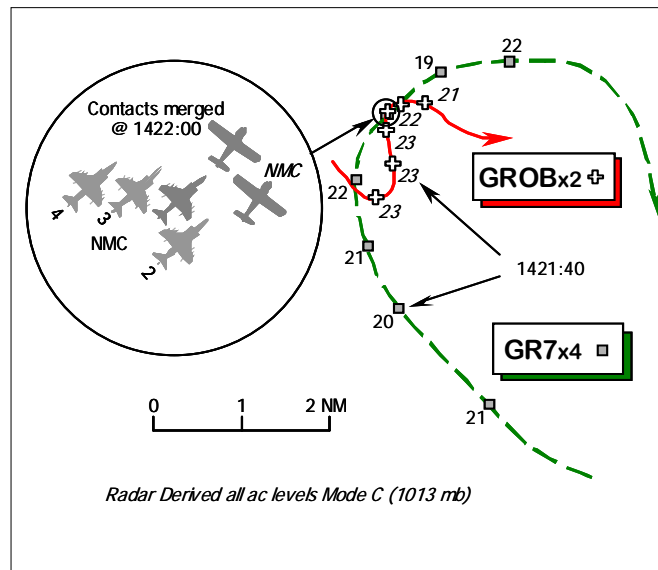
Visibility: >10km >10km

Reported Separation:

Nil H, 100ft V 200yd H, 800-1000ft V

Recorded Separation:

Contacts merged



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE HARRIER GR7 PILOT reports that he was leading a formation of 4 ac, flying at 380kt in standard 'Arrow' formation. He had been manoeuvring his formation in the general area for the preceding 15min [prior to an event at Cottesmore] whilst receiving a RIS from Cottesmore ATC; the assigned squawk was selected with Mode C, but neither TCAS nor any other form of CWS is fitted.

Whilst flying level at 2250ft Barnsley RPS (1016mb) in a gentle turn to starboard passing through 040°, he was talking to the formation on a squadron private frequency when he "sensed" two white coloured ac approaching rapidly from 12 o'clock about 500m away. Within two seconds his jet had passed 100ft directly below the two other ac – two Grobs that appeared to be in echelon starboard - whilst overtaking them from astern. Very soon afterwards, his formation No2 (on the starboard quarter) saw 3 ac in close formation, about 1nm to the N at about the same altitude. He turned his Harrier formation onto S to clear the area, and an Airprox was reported to Cottesmore. As he was speaking to the other formation pilots on a discrete frequency at the time of the Airprox, he could not rule out the possibility that a traffic information call from Cottesmore ATC might have gone unheard. Because of the late visual

acquisition, no avoidance manoeuvre had been initiated and he assessed the risk of a collision as "high".

THE GROB TUTOR PILOT, a QFI, reports that he was leading a pair of Grob Tutors engaged in a formation exercise. Both ac were coloured white and he was squawking the unit conspicuity code of A2641 [it was actually A7000] with Mode C; TCAS is not fitted and although HISLs were fitted, they were switched off (due to the proximity of the other ac). He was not in receipt of an ATS from any unit but he had already seen 3 other Firefly ac in the area, also in close formation.

His formation was flying at 90kt in close formation - with his No2 ½ a wing-span to starboard - operating in an area S of Cranwell, at an altitude between 2000-2500ft. Whilst in a gentle turn to starboard, 2 Harriers in close formation appeared low and to port before overtaking his formation and passing clear ahead. Almost immediately, a second Harrier pair appeared – he thought 'in trail' of the first pair. The GR7 formation passed about 200yd away about 800-1000ft below his ac and appeared to be wings level, if they were manoeuvring it was a very gentle manoeuvre and did not appear to him to be taking avoiding action, before they subsequently cleared the area to the

S. Although he was surprised to see 4 Harriers in close proximity, they caused no alarm to either Tutor pilot. There was no possibility of avoiding action, but it was not thought to have been necessary as the Harriers were already overtaking and passing clear when first seen, so, in his opinion, he did not consider that an Airprox had occurred. As neither formation had appeared to take any avoiding action, he adjudged that there had been no risk of a collision.

MIL ATC OPS reports that the Cottesmore RT tape transcripts are exactly one minute ahead of the radar recording timings and have therefore been correlated within this report to the radar time reference. Cottesmore DEPARTURES (DEPS) had been providing a RIS to the Harrier formation for some 20 min prior to the occurrence. During that period, traffic information was passed several times, including a transmission at 1421:40, *“...traffic northeast, 2 miles, manoeuvring, indicating 200ft above”*, [UKAB Note 1: This traffic information was not acknowledged by the Harrier formation leader]. At 1424:01, the formation leader advised *“...a couple of minutes ago we got ...rather close to 2 Fireflies [actually Grobs]...I'll be filing an Airprox once we get on the ground...”*.

Analysis of the Claxby Radar recording shows the Harrier formation manoeuvring 17nm NE of Cottesmore squawking A4604, indicating between 2000-2600ft Mode C (1013mb). Two contacts, squawking A2641 are shown NW of the Harrier formation indicating similar levels tracking SE. The easterly of these contacts - the subject Grob pair, changed to an A7000 squawk; the other 2641 squawk climbed as the 2641 and 7000 squawk contacts merge 5nm NW of the Harriers at 1421:10. These 2 contacts remain garbled on the recording until after the Airprox has been reported.

Cottesmore DEPS who was controlling several ac under a RIS in class G airspace, used correct phraseology when passing traffic information. The controller's workload was medium to high, but his division of attention was good passing timely, relevant and concise traffic information to the formation. Conflicting traffic garbling with a A2641 squawk, may have made it difficult for DEPS to provide accurate traffic information until it was legible at 2nm; however, prior to his call at 2nm, there was a period of 1½min for DEPS to call the traffic to the formation leader. In hindsight, this

garbled information may have been better than none. Prior to the Airprox, the tape transcript and the radar replay reveal that the traffic called to the formation of Harriers at a range of *“2 miles, indicating 200 ft above”* (although actually indicating 300ft above on the radar recording) was the Grob formation. No acknowledgement was received from the Harrier leader before the tracks merged. DEPS was providing a RIS to the Harrier leader in a published AIAA and a service limitation should have been given in accordance with JSP 318A, Section 235.140.2, which states *“Radar services are to be limited... when the aircraft is ... in areas of high traffic density”*. In his report the controller stated that he did not limit the radar service because he thought that the formation's track would lead away from the other traffic. The SATCO has since undertaken to ensure that all controllers will provide a limited service in an area of high traffic density, whether the aircraft are operating in a notified AIAA or not.

THE TUTOR PILOT'S UNIT comments that the airspace around Cranwell can be crowded at times with the resident Tutor, Firefly, Jetstream and Dominie ac surrounded by the Waddington traffic (often with ACMI exercises), Coningsby Tornados, east coast range traffic, parachutists, and Cottesmore/Wittering Harriers. In recognition of this, the Lincolnshire Airspace Users Group (LAUG) was established and still meets to spread awareness of potential conflicts. In this context, it is not surprising that these two formations came close to each other. Being overtaken, the Tutor pilots could not be expected to see the Harriers beforehand.

UKAB Note (2): The LTCC NODE L radar recording shows the Harrier formation leader squawking A4604 in a wide R turn through W, broadly level at 2100ft Mode C. Whilst the Grob leader is shown squawking A7000, initially on a northerly heading level at 2300ft unverified Mode C (1013mb). None of the other formation elements is distinguishable. At 1421:40, the Grob leader is shown still indicating 2300ft – 300ft above the Harrier leader - some 1.68nm N of the latter and moments before DEPS passed traffic information to the GR7 leader. The Grob pair commence a R turn and while passing NE are underflown by the GR7 formation at 1422:00, broadly as described by the Harrier leader. However, NMC is indicated at the closest point by both of the lead ac. Immediately before the merge

AIRPROX REPORT No 186/02.

the lead GR7 and the lead Grob ac indicated 2200ft Mode C and 2300ft respectively. Whereas, after the merge the corresponding Mode C indications were 1900ft and 2200ft respectively. Thus the vertical separation moments before the merge was 100ft, increasing to 300ft directly after the four GR7s underflew the Grob pair. Some 16 sec after the Airprox, the lead GR7 ac is shown passing $\frac{1}{2}$ nm S abeam and 400 ft beneath a westbound contact squawking A2641 indicating 2200ft unverified Mode C, which is believed to be the Firefly formation spotted by the No2 GR7 pilot; this contact and another shown above the formation at FL45 have been omitted from the diagram for clarity. However, their SSR labels would have been present on DEPS' radar display and might have hindered determination of the respective Mode C indications which showed both the Grob and Firefly formations to be operating within 400ft of the GR7's indicated level in the turn.

HQ PTC comments that the LAUG has just about exhausted every airspace management measure that it can apply in this crowded airspace, without actually stopping ac from flying. We urge the Units to give wide publicity to this incident to remind all aircrew and controllers that the problem has not gone away.

HQ STC comments that this incident occurred in a well-known area of congested airspace. While the Harriers were being assisted by an ATS, this Airprox illustrates yet again that ATC cannot always see and alert aircrew to all conflicts; aircrew must continue to lookout assiduously. Given the crowded airspace in which they were operating, it is surprising that the Grobs did not avail themselves of a LARS service for traffic alerting. Finally, it is disappointing that RAF training ac are not painted in conspicuous colours, but are still camouflaged white.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members wondered whether the 'limitation' to the radar service which DEPS should have applied according to military ATC regulations, would have had any material effect here. Whilst recognising from Mil ATC Ops' comments that the controller probably had an opportunity to pass traffic information earlier to the GR7 leader about the Grob pair, even though affected by SSR label clutter, when he subsequently did so, the leader did not hear it, thereby negating any advance warning that might have accrued under the RIS. The GR7 leader's honest and frank account was commended by the Board and this Airprox illustrated the pitfalls which can be encountered when operating on multiple frequencies at the same time, especially in the congested airspace of the Lincolnshire AIAA. Members were keenly aware of the overall benefits that a RIS can provide and notwithstanding the late/missed calls from DEPS here, the Board strongly endorsed the use of a radar service in this crowded airspace whenever possible. The STC member (a LAUG member) did not believe that the GR7 leader had chosen a good location to set up his holding pattern so close to the Cranwell MATZ. Difficulties operating in these crowded skies were understood, but there was concern at the number of Airprox which had occurred in this vicinity. Furthermore, the recent major re-organisation of the CAS in the vicinity had done nothing to allay these concerns. A re-examination of procedures was warranted by units which operate in this area and further discussions would follow at HQ STC outwith the meeting.

Evidently, neither the Grob leader nor his wingman were concerned by this close encounter and the Board recognised that they would have been unable to spot the GR7 formation, approaching rapidly from below and astern. A pilot member was surprised at the Grob leader's practice of not ensuring that the No2's HISL was on - it was fitted and should be used; every aid to conspicuity was essential in the crowded environment of the AIAA and SOPs existed to cover HISL ON/OFF procedures during close formation flying. Members were cognisant of the Grob's small cross sectional area, white colour scheme and tail-on aspect with little crossing motion to draw attention to the pair; this Airprox demonstrated how difficult they were to see - a lesson which needed to be widely shared. In the Board's view each pilot in the GR7 formation had responsibility for lookout here and all four pairs of

eyes in the formation had been defeated by this combination of factors until a very late stage. The Board also agreed that the GR7 leader's transmission to his formation was a contributory factor that had masked the vital 'heads-up' that had been provided – albeit late – by DEPS under the RIS. Although the Grob pair were “sensed” by the GR7 leader as he under flew them, the leader had revealed that he had been oblivious to their presence beforehand. The Grob pair had been spotted too late to be able to do anything about it and thus the Board agreed unanimously that the cause of this Airprox was, effectively, a non-sighting by the GR7 formation.

Turning to risk, the Grob leader and his No2 had been unaware of the 4 GR7s approaching rapidly from astern and so were unable to do anything to effect the outcome of this encounter. Similarly, the GR7 leader had been unable to take positive action until after he had passed beneath the Grobs. Fortunately, the lead GR7 had been 100ft below the pair as he under flew them which

increased to about 300ft immediately after the light ac had been overtaken, probably as a result of an instinctive reaction. Although the vertical separation that existed at the time was evidently enough to forestall an actual collision, it had been a close call nonetheless, such that the Board concluded, but only by a very close margin, that the safety of the ac involved had been seriously compromised.

PART C: ASSESSMENT OF CAUSE AND RISK

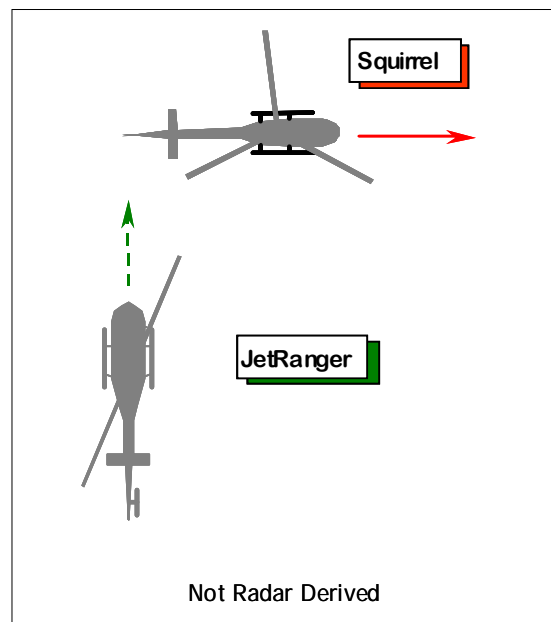
Cause: Effectively, a non-sighting by the GR7 formation.

Degree of Risk: B.

Contributory Factor: The GR7 formation leader missed the traffic information transmitted by DEPARTURES, whilst talking to the formation pilots on another frequency.

AIRPROX REPORT NO 187/02

Date/Time: 16 Sep 1425
Position: 5110N 0120W (1nm E of Bullington Cross)
Airspace: UKLFS/FIR (Class: G)
Reporting Aircraft Reported Aircraft
Type: Bell 206 Single Squirrel
Operator: Civ Comm HQ DAAvn
Alt/FL: 400 ft NR
 (agl)
Weather VMC CLNC VMC
Visibility: 10km+ NR
Reported Separation:
 200m H, 50-100ftVNot seen
Recorded Separation:
 Not Recorded



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BELL 206 JETRANGER PILOT reports that his helicopter has a silver/black livery and was

displaying red anti-collision beacon and HISLs. He was conducting a pipeline inspection flight and

AIRPROX REPORT No 187/02.

squawking A0036 with Mode C, but he was unsure whether he was in contact with an ATSU at the time – if he was it would have been Boscombe Down. TCAS was not fitted at the time (but is now). He was flying his helicopter from the RHD seat with an observer in the LHD seat - but was unable to see aft of the port door pillar because the observer's helmet blocked his view.

Flying at 400ft agl on a northerly heading at 110kt, he spotted the other ac (a single Squirrel with black/yellow military markings) late at L 10 o'clock – but did not specify a range - about 100-150ft below, flying straight and level in an easterly direction. It was immediately apparent that no avoiding action was necessary in the short time available, as his Bell 206 *“just about passed behind”* the Squirrel with about 200m horizontal separation, 50ft-100ft above the other helicopter. He was concerned that the Squirrel pilot had not seen his B206 and that he would not have been able to manoeuvre his JetRanger clear if the Squirrel pilot had turned or climbed; he assessed the risk as *“B - medium.”*

THE SINGLE SQUIRREL PILOT, a QHI, reports that he was flying an instructional sortie with a student. His helicopter has yellow/black colour scheme and HISLs, transponder and Mode C were all on; TCAS is not fitted. He was receiving a FIS from Odiham on UHF at the time, but did not see the Bell 206 and was unaware of the Airprox. Therefore, he was unable to provide any further constructive input to the investigation of this occurrence .

UKAB Note (1): It would appear that the B206 pilot did not contact Boscombe Down ATC as there is no FPS or log entry for the Bell 206 on that day. The Squirrel pilot's report was not received until 211016Z Oct and thus the Odiham RT recordings were not available, neither could Odiham ATC provide any constructive information on the Airprox.

UKAB Note (2): The Airprox occurred below the coverage of recorded radar.

UKAB Note (3): This Airprox occurred within PINS Gas Area K3; The pm PINS NOTAM for this day - UKLB2334 - was transmitted 151121Z Sep and notified this area – amongst others - as being active 11-1600UTC.

HQ DAAvn comments that the Squirrel pilot was on a properly authorised serial of the Army Pilot's Course and, as is the norm, all military training ac operating east of the A34 road check in with, and monitor Odiham ATC frequencies under a FIS. There is little we can add but, given the frequent heavy traffic in this area, it might have been more prudent for the PINS aircraft to have called Odiham which may at least have alerted both crews to each other's presence.

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.

Members contended that this was another example where the Pipeline Inspection Notification System (PINS) had been found ineffective. Basically notification provided here to military pilots through the PINS NOTAM highlighted at Note 3, was that this pipeline inspection helicopter might be encountered somewhere in the notified areas across southern England within a 5 hour period – which the Board agreed was not specific enough to be of any practical use. Possible improvements to the system were discussed, but this was more properly a matter for the PINS working group and outwith the remit of the Board to propose revisions to what was generally acknowledged to be a less than perfect system.

Thus the responsibility here for safe separation was on both pilots to see and avoid each other's helicopter. The army member wondered why the JetRanger pilot had not communicated with either Middle Wallop or Odiham ATC, which might have revealed the presence of the pipeline helicopter to the Squirrel crew – or vice-versa – just by listening to transmissions on the frequency. A pilot member noted that the JetRanger pilot was flying at 400ft agl and explained to the Board that although pipeline inspection flights are recommended to operate in the height band of 500-700ft agl, where they will be above and sky lined to the majority of military low-flying ac, they can be encountered below this height as illustrated here. The army pilot member added

that visibility from the cockpit of the Squirrel was poor. Seated in the LHS, it was the Squirrel QHI who was ultimately responsible for ensuring that his helicopter was operated in accord with the 'Rules of the Air', which required him in this converging situation to give way to the JetRanger – if he saw it. The student occupying the RHS was in the best position to sight the JetRanger that should have been sky lined 50-100ft above the Squirrel – even at this close range. However, it appeared to pilot members that his concentration was elsewhere to the detriment of lookout, for neither he nor his instructor had seen the JetRanger at all, which in the Board's view was plainly part of the cause. From the JetRanger pilot's laudably frank account it was evident that he had sighted the Squirrel at a very late stage – across the cockpit around his non-aircrew observer in the LHS – and here members noted that the yellow roof of the Squirrel had done little to aid conspicuity from above. The Board concluded that this late sighting was also intrinsic to the cause.

Turning to risk, the JetRanger pilot had opined that no avoiding action had been needed, as it was immediately apparent that his B206 was going to pass just behind the Squirrel, which led some members to conclude that no risk of a collision existed. Others contended that this was purely fortuitous. The Squirrel crew could not have effected the outcome, as they were entirely

oblivious to the presence of the other helicopter. There was no radar recording to provide independent confirmation of the minimum separation, but there was no reason to doubt the veracity of the JetRanger pilot's report that it was a mere 200m away and 50-100ft below as the Squirrel flew in front of him. At these speeds the JetRanger would have covered that distance in just over 3sec, leaving little time for its pilot to react to any unexpected manoeuvre that the Squirrel student may have made. The close proximity of the two helicopters with only one pilot aware of what was happening led the Board to conclude – by the narrowest of margins – that the safety of the ac involved had been compromised in the circumstances reported here.

A member observed that operators that are contracted to conduct pipeline inspection flights are now required to have a form of TCAS fitted to their helicopters. The Board are encouraged to learn that this operator had fitted their entire fleet with TCAS (Skywatch) and double HISLs.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A non-sighting by the Squirrel pilot and a late sighting by the B206 pilot

Degree of Risk: B.

AIRPROX REPORT No 188/02.

AIRPROX REPORT NO 188/02

Date/Time: 24 Sep 1416

Position: 5053N 000357W (1nm N of Winkleigh)

Airspace: London FIR/ (Class: G)
UKDLFS LFA 2

Reporting Aircraft Reported Aircraft

Type: B206 Harrier GR7

Operator: Civ Comm HQ STC

Alt/FL: 400ft 300ft
(QNH mb) (Rad Alt)

Weather VMC CAVOK VMC

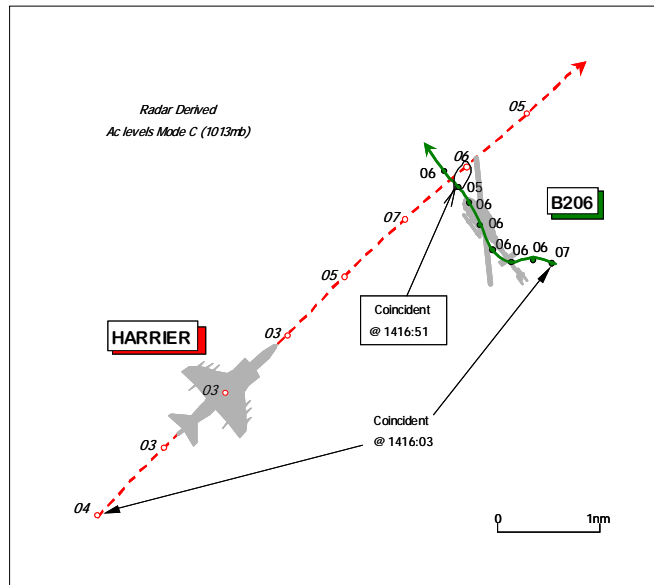
Visibility: >10km NK

Reported Separation:

2-300m H, 100ft V 500ft H, 200ft V

Recorded Separation:

0.25nm H, 100ft V



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE B206 (JETRANGER) PILOT reports that he was flying with an observer on a pipeline patrol notified by his operating company iaw published Pipeline and Powerline Procedures (PINS). The weather was CAVOK with >10km vis and no cloud cover. His ac was coloured silver and black and a HISL and red anti-collision beacon were selected on. He was squawking SSR Mode A code 0036 with Mode C. Neither TCAS nor other form of CWS was fitted. Whilst operating in PINS Area J2 at 110 kt on a hdg of 330° and at 400ft (unspecified QNH) he noticed the shadow of ac on the ground ahead, causing him to look for the ac. He spotted it left of the nose crossing very quickly ahead. The other ac, which he recognised as a Harrier, appeared to be level, or possibly in a slight climb, before turning to port when it was in his 11-12 o'clock. There was no time to react before it passed ahead about 100ft above, so no avoiding action was taken. He estimated that minimum separation distance had been 2-300m. He did not think that the other pilot had seen his helicopter since he passed so close in front. Either that or the other pilot had been irresponsibly close. He assessed that the risk had been high.

UKAB Note (1): NOTAM UKLB 2510 PINS PM was published on 23 Sep at 1755 and

promulgated gas area J2 [amongst others] as active on 24 Sep 1100 to 1700.

UKAB Note (2): UK AIC 54/2001 para 3.1 states: "Aircraft engaged on pipeline inspections are recommended to operate in the height band 500 ft to 700 ft agl where they will be above, and skylined to, the majority of military low flying aircraft which operate below 500 ft. However, since both pipeline inspection and military aircraft can be expected to operate outside of these height bands pilots are not absolved from maintaining a good lookout and applying visual avoidance criteria. In particular, it should be noted that helicopters involved in inspections will continue, when required by the inspection, to descend to 300 ft in accordance with the provisions of the Rules of the Air Regulations 1996, Rule 5(i)(e). ..."

THE HARRIER PILOT reports that his ac was camouflaged grey and that HISLs were selected on. He was the No2 of a pair flying in battle formation, with his leader about 1.5nm to the S, returning to St Mawgan at low level during a military exercise. He was squawking SSR Mode 3/A code 1200 with Mode C but neither TCAS nor any other form of CWS was fitted. Hdg 036°(T) at 420 kt and at 300ft (Rad Alt) he saw a helicopter

hdg NW at co-altitude about 2-1.5nm ahead. He climbed to pass above by 200ft and about 500ft H displacement. He rocked his wings and then returned to low level. He assessed that the risk of collision had been very low.

UKAB Note (3): UK MIL AIP SECT 7 para 2 states: *“Civilian helicopters engaged in pipeline inspection activity can legally fly below 500ft AGL, and may at times descend to GL as required for closer inspection of potential hazards to the pipeline. Civilian helicopters are aware that operations at these heights may place them in potential conflict with military FW ac, and thus have agreed to carry out their tasks primarily in the 500 to 700ft AGL height band. Therefore military FW ac are to, whenever possible, avoid LF in the 500 to 700ft AGL height band.”*

THE HARRIER PILOT’S UNIT comments that the Harrier pilot saw and avoided the helicopter by sensible margins; he also gave an unofficial, but universally acknowledged, wing rock to let the other pilot know that he had been seen. In the circumstances he could do no more than ‘see and avoid’, which was his responsibility.

HQ STC comments that the Harrier pilot reports seeing the helicopter at between 12 and 15 sec ahead, which has to be regarded as a late sighting. He then makes a slight climb and course correction but insufficient to avoid causing the B206 pilot considerable concern. A margin of separation of 200ft V and 500ft H is not sufficient for comfort, given that in combat and evasion training a minimum separation of 1000ft is stipulated.

UKAB Note (4): Met Office archive data reveals that the Wessex RPS for 1400–1500 was 1021mb.

UKAB Note (5): Analysis of the Burrington recorded SSR-only data reveals the B206, squawking Mode A code 0036 tracking WNW. At 1416:03 it displays 007 on Mode C. The Harrier, squawking Mode 3/A code 1200 is 8.9nm to the SW tracking NE. At 1416:29 the B206, displaying 006 on Mode C, turns onto a NW track putting the Harrier in its 9 o’clock at range 3.8nm. At 1416:44, when the subject ac are 0.76nm apart, the Harrier displays 007 on Mode C, whilst the B206 displays 005. CPA occurs just before the next sweep, timed at 1416:51. It would appear

from the radar recording that the Harrier passed about 0.25nm ahead of the B206 and, from consecutive Mode C indications, about 100ft above.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It was evident to members that this was another event where resolution relied solely upon the see-and-avoid principle. Members noted that the B206 pilot, who would have been disadvantaged by having to look across cockpit, had seen the Harrier late and then only as a result of seeing the ac’s shadow on the ground. A civil helicopter pilot advised members that in order to comply with the exemption from the 500ft rule (Rule 5(i)(e)), with effect from the end of May 03 pipeline inspection helicopters will be required to fly with TCAS fitted. The Harrier pilot, members agreed, should have been better placed to see the helicopter; that he had only seen it 12 to 15 sec before the ac tracks crossed was, they thought, quite late and may have been the result of the B206’s lack of relative motion in the canopy. Nonetheless, the Harrier pilot had seen the B206 and elected to pass above and ahead, although it was evident that the margins he selected had discomfited the B206 pilot. A civil helicopter pilot suggested that the Harrier pilot had adequate time to give a greater margin and that he had not done so reflected disregard of other airspace users. A military pilot reminded members that military customarily use 1000ft V separation when conducting mutual sorties and therefore the Harrier pilot should have provided a greater margin. An additional point was that the Harrier pilot could also have shown more consideration had he elected to fly behind rather than ahead of the B206. However, members were agreed that action taken by the Harrier pilot had removed any risk of collision.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Harrier pilot flew sufficiently close to cause concern to the B206 pilot.

Degree of Risk: C

AIRPROX REPORT No 189/02.

AIRPROX REPORT NO 189/02

Date/Time: 25 Sep 1340

Position: 5200N 0308W (3nm NE of Talgarth GS - Nr Twmpa/Lord Hereford's Knob)

Airspace: UKDLFS/FIR (Class: G)

Reporting Aircraft Reported Aircraft

Type: KA 13 Glider Jaguar pair

Operator: Civ Club HQ STC

Alt/FL: 2600ft 1000ft

(altitude) (Rad Alt)

Weather VMC SKC VMC

Visibility: 15km+ 10km+

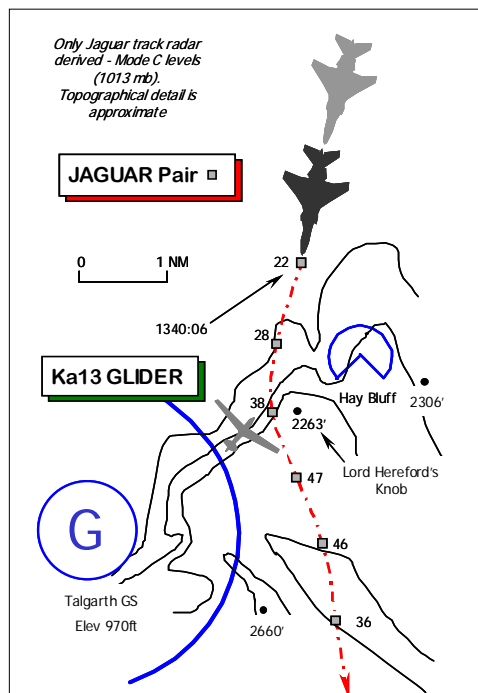
Reported Separation:

v No2: 200ft H, 100ft V

v No1: 500ft H, 500ft V 800m H, 200ft V

Recorded Separation:

Not recorded



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE KA 13 PILOT, a gliding instructor, reports his 2 seat training glider has a red fuselage with white wings. He was conducting a training flight from Talgarth over the Black Mountains as the PF from the rear seat, with a student occupying the front seat, gliding in clear air with no cloud and an in-flight visibility of 15km+.

Flying at 50 kt, in 'ridge lift' at an altitude of 2600ft, heading NE'ly along the escarpment towards Hay Bluff, directly over Twmpa (Lord Hereford's Knob) two Jaguar fast-jets in line astern, flew in very close proximity to his glider. Both Jaguars approached from the vicinity of Hay-on-Wye, a town to the N – flying southerly over Twmpa towards Abergavenny. The first Jaguar was spotted about ½nm away and passed 200ft horizontally ahead from L to R and 100ft above his glider as the jet turned L; the second Jaguar ac was spotted 1nm away and climbed in a R turn as it passed 500ft astern and 500ft below his glider in between one other glider and two hang gliders.

UKAB Note (1): The UK AIP at ENR 5-5-1-5, promulgates Talgarth Glider Launching Site for aerotow launches by Tug, during daylight hours.

As a tug launch glider site no maximum cable height is specified.

UKAB Note (2): The Meteorological Office reports that the COTSWOLD RPS for the period was 1018mb. From archive data, the actual QNH 3NM NE of Talgarth at 1340UTC was about 1022mb. Given an elevation of 970ft on that day with a QNH of 1022mb, Meteorological Office data gives a QFE for Talgarth of approximately 987mb.

THE JAGUAR PILOT reports he was flying as the No2 of a pair on a low-level sortie in LFA 7, but at the time of the Airprox was leading the formation with the No1 in trail astern. The ac has a grey camouflage scheme but HISLs were on. Heading 160° at 450 kt the formation was flying at about 1000ft agl on a track that took both ac close to Talgarth glider site but outside the mandatory UKDLFS Avoidance Area. As the formation passed Talgarth the No2 spotted several gliders at a range of 1km, reported the sighting to the No1 following behind, and pulled up out of the area. The No1 saw two gliders about 800m to starboard flying slightly above his ac in the opposite direction. At the time when the No1 saw the

gliders the best course of action was to continue on his present heading. The No2 did not specify the minimum separation between his ac and the glider flown by the reporting pilot nor did he assess the risk.

UKAB Note (3): The UK MIL Aeronautical Planning Document at Vol. 3 Part 1 Pg. 1-2-7-6 (LFA 7) promulgates a mandatory avoidance area of 2nm radius around Talgarth GS (GS02) below 2000ft msd. A warning is also promulgated that *"...a considerable amount of soaring takes place on most weekdays in the wider surrounding Black Mountain area"*. Furthermore, the regulation extant at the time required military crews to avoid Hay Bluff Hang-glider site by 1nm radius below 2000ft msd.

UKAB Note (4): The UK MIL Aeronautical Planning Document at Vol. 3 Part 1 Pg. 1-2-7-3 (LFA 7) promulgates a deconfliction measure in the flowed gap formed between the Talgarth GS and Hay Bluff Hang-glider Site avoidance areas, which is to be flown in a northwesterly direction.

UKAB Note (5): A review of the LATCC Clee Hill radar recording is inconclusive and does not illustrate this Airprox. Occasional primary returns are shown in the vicinity of Talgarth GS and along the area of the ridge-line towards Lord Hereford's Knob about 2min before the Airprox, but when the Jaguars are shown flying through the vicinity no primary returns which could be associated with the glider flown by the reporting pilot are evident. The Jaguars are shown only as a single A7001 SSR response therefore it is not possible to determine whether this is the No2 or trailing No1. The Jaguar approaches the flowed gap from the N – southbound - indicating 2200ft Mode C (1013mb) [about 2470ft QNH (1022mb)] at 1340:06. The contact is shown passing just over 1nm W of Hay Bluff where a rapid climb is evident through 2800ft Mode C [3070ft QNH] and on the next sweep, 8sec later, the jet is shown passing 3800ft [4070ft QNH and in the order of 1800ft agl]. The Jaguar ascends to a maximum of 4700ft Mode C [4970ft QNH] passing 2½ nm E of Talgarth GS before descending.

THE JAGUAR PILOT'S UNIT COMMENTS that the Jaguar pair were operating in Class G airspace within the bounds of the UKDLFS. The Glider site in question is a particularly busy one but is afforded an avoidance restriction of 2nm

below 2000ft msd. The pilots concerned complied with the published avoidance criteria.

HQ STC comments that the flow arrow stated at UKAB Note (4) necessitated the climb that put the Jaguars in direct conflict with the glider. That said the wisdom of the Jaguar crews' transit close to this area of high-density soaring aircraft is in doubt. Couple this with the small cross-section glider approaching head-on from out of sun and it is not surprising that the Jaguars did not spot the glider until very late. A suggestion would be for the gliders to warn by NOTAM their intended use of Hay Bluff ridge with Mil LF Ops team at West Drayton and this would warn other Class G users of their presence. This is a classic late 'see and avoid' within Class G airspace flown within the bounds of the UKDLFS compounded by poor route selection, poor glider conspicuity and difficult environmental conditions.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board was briefed that two other Airprox had occurred in recent years at this choke point (122/01 & 156/01) and both involved encounters between military jets and gliders. Since this Airprox occurred, the method for notifying hang glider activity at Hay Bluff has changed; it is no longer a permanent avoid, but now subject to NOTAM activation.

Members agreed with the STC perspective that the Jaguar pair's chosen track through the area was poor. It was unclear whether it was the No2 - leading at the time - or the No1 who had decided to fly between these two LFS avoidance areas, but whoever, there was general agreement that it was an unwise airmanship decision to climb through such a narrow choke point between these two mandatory avoids (at the time) where gliders were known to operate extensively. Some military pilot members thought the Jaguar's 'climbout' to avoid the 'flow' was the catalyst which had triggered this Airprox, whereas others thought that the military deconfliction measures - designed to prevent conflicts between opposite direction military ac - had little bearing on the Airprox as

AIRPROX REPORT No 189/02.

they applied purely to military pilots. Either way the Jaguars had left it too late and had climbed into conflict with the glider soaring above the ridge. It was not entirely clear from reports if the leading No2 Jaguar pilot had spotted the reporting glider (or another one) as he pulled up out of the area – followed by the trailing No1. If he had seen the glider flown by the reporting pilot, it was thought inconceivable by some that he would have intentionally flown as close as 200ft horizontally across its nose. Unfortunately, there was no radar data to support the minimum separation or the possibility that the No2 had not seen the subject glider to starboard as he climbed above it. The reporting glider pilot had said that the second Jaguar – the No1 – had passed astern and 500 ft below, whereas, the trailing No1 Jaguar pilot had apparently seen all the gliders to starboard. Some members thought the No1 might have seen the subject glider to starboard and then turned to pass astern of it, but the reported pilot's diagram clearly showed the glider remaining to starboard which led members to suspect that the No1 had not seen it at all as it passed to port. This was entirely feasible; the small cross-sectional area displayed by gliders is notoriously difficult to spot – especially with little crossing motion to draw attention to them and he may have been distracted by the other gliders to starboard. Neither of the sighting issues could be resolved totally from the information available and in the end the Board determined that this Airprox had

resulted from a combination of two factors; the Jaguar pair had flown into conflict with the glider in a known area of congested airspace.

Without recorded radar data, it was impossible to reconcile the differences in the geometry of this encounter from the differing perspectives reported. If the No2 pilot had not seen the Ka13, or flown as close as that reported, on either count members agreed that safety had been compromised. The No1 pilot's perspective of this incident was so wide of the mark compared to the glider pilot's account, that members strongly suspected that the Ka13 had not been spotted by him either. The only firm estimate of separation had come from the glider pilot which placed the No2 very close indeed and the No1 passing close between another glider and two hang gliders, the latter apparently unseen also. Though a collision had been averted, this had not been a safe situation with sufficient uncertainty attaching to persuade the Board that the safety of the ac involved had been compromised.

PART C: ASSESSMENT OF CAUSE AND RISK

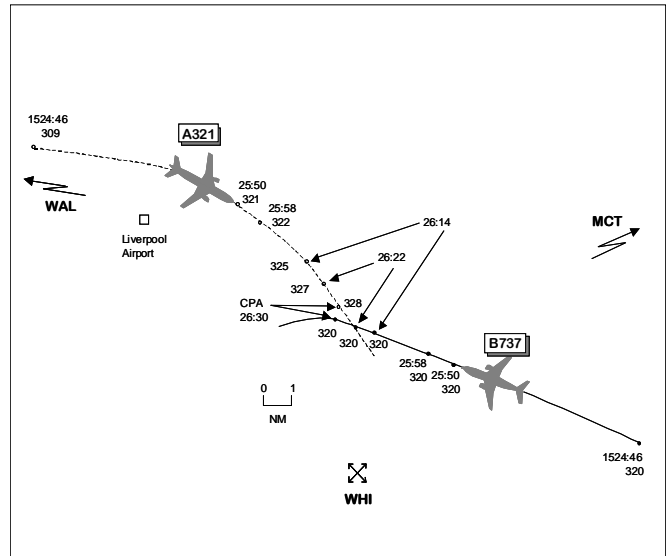
Cause: The Jaguar pair flew into conflict with the glider in a known area of congested airspace.

Degree of Risk: B.

AIRPROX REPORT NO 190/02

Date/Time: 27 Sep 1526
Position: 5317N 0238W (6nm N WHI NDB)
Airspace: UAR (Class: B)
Reporter: LACC LAKES/WIRRAL TACTICAL

	<u>First Aircraft</u>	<u>Second Aircraft</u>
<u>Type:</u>	A321	B737-800
<u>Operator:</u>	CAT	CAT
<u>Alt/FL:</u>	↑FL330	FL320
<u>Weather</u>	VMC CLAC	VMC
<u>Visibility:</u>	>30km	
<u>Reported Separation:</u>	600ft V 1000m H 1000ft V NK H	
<u>Recorded Separation:</u>	800ft V 0.4nm H	

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

THE LACC LAKES/WIRRAL TACTICAL CONTROLLER reports that he had cleared the A321 to climb to FL330 on a radar heading of 100° (previously assigned by Dublin) whilst the B737 was cruising at FL320 on a routeing of TNT - WAL. He then became involved with a situation elsewhere on the sector and forgot the A321 was still on a heading until reminded by the crew at which time the ac had reached 8nm E of WAL; the ac was then cleared 'own navigation' to HON. However, he did not appreciate that the A321's new flight path would conflict with the B737. The A321 crew, he thought, reported traffic ahead at range 7nm, which he identified as the B737. [UKAB Note (1): The RT transcript shows the B737 crew reporting traffic 7nm ahead]. He gave the A321 an avoiding action L turn onto 070°, as he saw that it was 200ft above the B737 and climbing, followed by an avoiding action L turn to the B737 onto 240° with TI. After asking the A321 crew to expedite the climb the subject ac passed about 2nm horizontally and 600ft vertically apart.

THE A321 PILOT reports climbing to FL330 at 395kt en route to Heathrow and in receipt of an ATS from London. He observed traffic on TCAS and then visually in his 10 o'clock range 10nm at a similar level. Whilst monitoring its progress,

ATC issued a turn instruction onto heading 070° as TCAS gave a TA alert. The other ac, a B737, was seen to pass 600ft below and 1000m away. As good visual contact had been maintained throughout and without an RA alert being received, he assessed the risk of collision as low.

THE B737 PILOT reports flying on track TNT to WAL cruising at FL330, he thought. About 20nm to run to WAL, TCAS indicated 'proximate traffic' 7nm ahead 200ft above and climbing. When he called ATC stating "c/s we have traffic ahead at 7 miles", the controller appeared to speak to the other ac to identify it before issuing him with an avoiding action L turn onto 240°. The controller then told the other ac to expedite his climb, TCAS gave a TA alert at range 5nm and the ac was seen by the FO as an Airbus which passed down his RHS 1000ft above. No RA alert was received by TCAS and he believed that there was never any loss of separation.

ATSI reports that the controller described the traffic loading at the time of the incident as moderate and, owing to staffing considerations, he was operating as the combined Lakes/Wirral Sector (S3, S4, S7) Tactical Controller. He added that, although the traffic situation was complex, he

AIRPROX REPORT No 190/02.

did not consider that operating in band-boxed configuration contributed to the occurrence.

The A321 established communication with the Lakes/Wirral Sector at 1515, reporting heading 090° and climbing to FL230. The radar shows the ac, passing FL205, positioned on the S side of Airway L975, in accordance with the Permanent Traffic Orientation System for eastbound flights. The A321 was instructed to continue the heading and climb to FL330, the exit level for the sector. The controller explained that, although the B737's fps was probably showing on his display at FL320, the ac was a considerable distance away at the time. As he expected that the A321 would reach its cleared level by Wallasey (WAL), he did not consider that the two flights would conflict. He did add, however, that in his experience the climb rate of an A321 varied considerably, depending on conditions. To ensure that the A321 remained within the airway, at 1519, it was given a R turn onto a heading of 100°.

The B737 made its initial call on the frequency, at 1519:53, climbing to FL320. The radar shows it passing FL301, approaching TRENT (TNT). The ac was instructed to maintain FL320 on reaching and route TNT-WAL. The controller explained that the standard routing would have been via Manchester (MCT) but to shorten the distance he routed it to WAL. However, this routing resulted in the B737 being positioned on a potentially conflicting track with the A321. The A321 was passing FL257 at the time, and indicated an average ROC of just over 1000fpm during the preceding five minutes. The controller still did not consider that the two flights would conflict.

He said that at about this time his attention was focused on a request from MACC for an ac, not originally planned to enter the sector, to be accepted. This involved him in extra discussion with the Planner, with the ac concerned showing only as a background track until its details were electronically entered into the system. In the process, he overlooked the fact that the A321 was still on a radar heading, which only became apparent following comment from its pilot. By this stage the A321 had passed WAL and was instructed to turn for Honiley (HON). The radar reveals that, at the time (1524:46), the subject ac were 25nm apart, the B737 was maintaining FL320 and the A321 was passing FL309. The turn for HON resulted in the two ac being placed

on virtually head-on reciprocal tracks. The controller stated that he had not realised the conflict because he had, inexplicably, overlooked the presence of the B737.

The Tactical Controller said that, at 1525:53, he heard a call on the frequency commenting about traffic seven miles ahead. He stated that he was unaware, initially, of the source. However, he soon recognised that the call was from the B737 [UKAB Note (2): not the A321 as reported in his CA1261] and, realising the situation between the subject ac, instructed the B737 to *“turn left immediately radar heading two four zero”*. He then transmitted to the A321: *“...can you expedite your climb please traffic twelve o'clock range seven miles and also turn left onto heading of zero seven zero”*. The controller admitted that he should have used the term 'avoiding action'. He commented that, as he was not practised in the use of the term, in the heat of the moment, he just transmitted the requisite instructions.

[UKAB Note (3): The radar, timed at 1526:14, when the A321 was being issued with a L turn, shows the two ac 3-5nm apart, the A321 was now 500ft above the B737. Eight seconds later (1526:22) the distance had closed to 2nm, when the A321 was 700ft higher than the B737. As the subject ac passed 0.4nm apart, the vertical separation had increased to 800ft.]

The controller believed that STCA may have activated during the incident, but only after he had become aware of the situation.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

ATCO members were clear that the Tactical Controller had set in motion a plan where separation was based on ac performance but he had not monitored the situation, even though he was aware of the variable climb performance of the A321. The use of other technique options were open to the controller. One method would have been to climb the A321 to a level below, and

vertically separated from, the opposite direction traffic, until flight paths had crossed. Alternatively, he could have cleared the Airbus to climb to its cruising level but with a proviso that it should achieve this by a known position, in this case WAL, well before the ac were in conflict. However, none of these was followed and in the end he had not ensured that standard separation was maintained between the subject ac and it was this that had caused the Airprox. The NATS advisor was surprised by the controller's comments, as 'avoiding action' scenarios were covered routinely during 'TRUCE' training including practising the use of the appropriate phraseology therein.

The controller, even after a prompt from the A321 crew that they were still flying on an assigned heading, still did not take the B737 into account when he then allowed the Airbus to resume its own navigation, by turning R, towards HON. After the B737 crew had alerted the controller to the approaching Airbus 7nm ahead, he had quickly issued turn instructions to both crews as well as an 'expedite climb' instruction to the A321, as it was seen to be already 200ft above the B737 and climbing. Meanwhile both airliner crews had seen

the potential confliction earlier on TCAS. Both had received TA alerts and had visually acquired and watched each other whilst their vertical flight profiles quickly diverged. Members noted that, for whatever reason, neither ac apparently turned, as instructed, which would have ultimately increased the lateral separation at the CPA. It may have been that both crews were concentrating on the TCAS indications whilst trying to spot one another visually, and had believed that the lack of RA guidance had meant that the situation had been resolved adequately in the vertical plane. Although there had been some untidy elements to this incident, the actions of both crews combined with those of the Tactical Controller were enough to convince the Board that any risk of collision had been safely removed.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The LACC LAKES/WIRRAL Tactical Controller did not ensure standard separation between the A321 and the B737.

Degree of Risk: C

AIRPROX REPORT No 191/02.

AIRPROX REPORT NO 191/02

Date/Time: 2 Oct 1422

Position: 5113N 0009W (0.5nm WSW Redhill
- elev 221 ft)

Airspace: ATZ (Class: D/G)

Reporting Aircraft Reported Aircraft

Type: Robinson R22 Hughes H369

Operator: Civ Trg Civ Pte

Alt/FL: 420ft↑ 950ft

(QFE) (QFE 1011mb)

Weather VMC CLBC VMC HZ

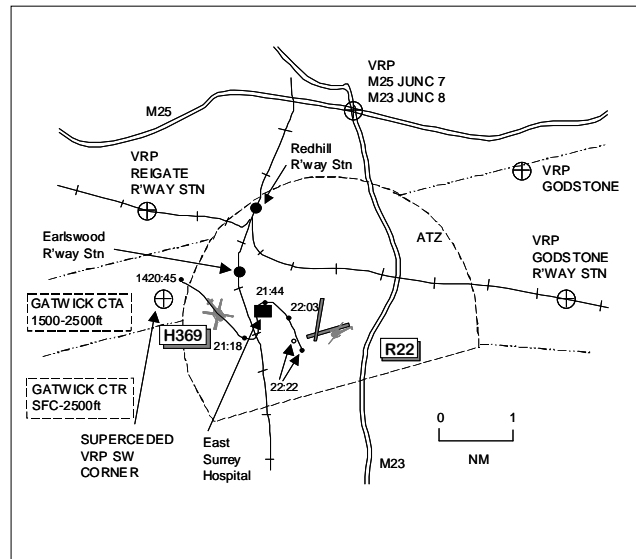
Visibility: 30km 8km

Reported Separation:

0ft V 50m H 150-200ft V

Recorded Separation:

not recorded



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE ROBINSON R22 PILOT reports flying a local dual training flight with a PPL (H) student from Redhill and in receipt of a FIS from Redhill Information, he thought, on 119.6MHz. The visibility was 30km 3000ft below cloud in VMC and the ac was coloured white with a blue stripe. During his climbout from the RW26 Heli-Strip heading 260° at 60kt and climbing through 420ft QFE, he spotted a Hughes helicopter approaching very fast from his 2 o'clock range 500m at the same level. It was in a 'sweeping turn' from a southerly onto an easterly heading and passed 50m ahead R to L. He had heard on RT ATC instruct the Hughes pilot to "join DW behind the Robinson" but it appeared that the Hughes had carried out a non-standard cct join by flying low level through the RW26 climb out. He assessed the risk of collision as high.

THE HUGHES H369 PILOT reports inbound to Redhill from a private site in Somerset and in receipt of an ATS from Redhill on 120.27MHz, he thought. The visibility was 8km in VMC and the ac was coloured dark green; his high intensity white strobe light was switched on. He had called on frequency about 15nm to the W of Redhill and told the controller that he was inbound, eventually for Hangar 1, and said that he was not familiar with the airfield; ATC told him to report at the railway

station on the VRP South West Corner. Tracking N of the Gatwick CTR/CTA he passed Dorking and reported the railway station in sight and turned southbound at 950ft QFE and 80kt. The controller said "I have you, carry on and turn left to downwind two six left and land behind the helicopter taking off" which he complied with. Being seated on the LHS, he only saw the departing helicopter as it passed just to his L, almost immediately below him by 150-200ft, as it had been obscured by the LH front door lower quarter panel. He thought the other helicopter's pilot may not have seen him as its flight path had been into sun and haze to the W.

UKAB Note (1): The VRP South West Corner (road junction A217/A2044 SW outskirts Reigate) as shown on the Pooleys Flight Guide extract submitted by the H369 pilot is no longer current. The UK AIP AD 2-EGKR-4-1 (7 Sep 00) Redhill Local Flying Area Chart shows the revised VRPs whilst AD 2-1-4 Flight Procedures Para f lists the 4 VRPs established for use by aerodrome and en route traffic:-

Junction 7 M25/Junction 8 M23, Reigate Railway Station [1nm N of old VRP SW Corner], Godstone (Junction of A25 and B2236 roads) and Godstone Railway Station.

UKAB Note (2): During a subsequent telephone conversation with the H369 pilot, he confirmed that he had been using the out of date Pooleys Flight Guide chart which had been attached to his completed CA1094 report form.

THE REDHILL ADC reports the Hughes pilot reported inbound from the W at approx 1415 saying he was unfamiliar with Redhill (pilot had not obtained PPR prior to calling). He asked the pilot to report at Reigate Railway Station and told him to expect a downwind LH join for RW26 Heli-strip; this was readback correctly at the second attempt. On calling at Reigate Railway Station, the helicopter was seen and judged to be inside the ATZ to the NW of the aerodrome in the vicinity of East Surrey Hospital. He told the Hughes pilot to cross the RW26 climbout and follow the departing R22 into the LH cct. However, the Hughes was seen to be flying at about 500ft and crossed N to S over the RW08 thresholds, passing ahead of the R22. The Robinson pilot advised his intention to file an Airprox whilst the Hughes flew a tight LH cct to the heli-strip.

UKAB Note (3): The Redhill RT recording did not provide a full picture owing to an equipment fault which caused the loss of some RT data. The Hughes pilot's initial call at 1416 reveals *"...inbound to you we would like to go to the North Hangar please, I'm not familiar with the airfield can we come straight in from the west?"*. After the ADC clears the ac to *"...route towards the Reigate Railway Station to the north west of the airfield, expect to position onto the downwind left....."* the recorded data is lost returning again about 7 sec later with the H369 pilot stating *"one one er OK ac c/s"*. The ADC immediately replies *"er roger and it's the Reigate Railway Station runway's two six QFE 1011"*. The Hughes pilot responds *"er station 1011"*. At 1419:15 the R22 pilot calls ready for departure into the cct and is cleared for take-off LH cct and is given the surface wind. Just before 1420, the H369 pilot calls *"Redhill H369 c/s we're just holding at ????? station"* to which the ADC replies *"helicopter H369 c/s Tower roger I have you just to the north west of the airfield actually from there if you cross the...."* after which the data is lost until an abbreviated H369 c/s acknowledgement call is heard 10 sec later. A further 25 sec later the R22 pilot calls *"... ??? be reporting on that Hughes that's just cut right across in front of me"* to which the ADC responds *"He was instructed to route in directly behind you*

to follow you around the circuit". The R22 pilot then reiterates *"he cut right across with me he was on, right across in front of me and I was climbing in the circuit"* after which, in agreement with the ADC, he reports the incident as an Airprox.

ATSI comments that there appears to be no apparent ATC causal factors.

UKAB Note (4): The UK AIP AD 2-EGKR-1-1 Operational Hours Para 12 Remarks states: *This aerodrome is PPR*. AD 2-EGKR-1-3 Flight Procedures states:-

(a) Variable circuits, no dead-side, helicopters will fly a circuit pattern opposite to that used by fixed-wing aircraft.

Circuit height: Fixed-wing and Helicopters 1000ft QFE (1221ft QNH).

(b) All inbound aircraft must establish contact with Redhill ATC at least 5 minutes prior to their ETA.

(c) VFR Arrival and Departure procedures:

ATC will require **all** VFR aircraft to enter and leave the ATZ by routing via one of the VRP's (listed in para f)[see UKAB Note (1)] as follows:-

(i) Fixed wing aircraft:

(ii) Helicopters:

(1) Join at 1000ft QFE and enter the circuit pattern via the appropriate VRP;

(2) Departures are to maintain 1200ft QNH until passed the appropriate VRP.

(d) Two grass heli-strips (H01/H19 and H08/H26) are marked on the aerodrome with standard ICAO markings, these markings are not load bearing, helicopters must **not** alight on the heli-strips. The heli-strips are available for use by helicopters up to and including AS55, larger helicopters will operate from points designated by ATC.

The heli-strips are separated from the fixed-wing runways and procedures are in place that permits independent helicopter/fixed-wing operations.

UKAB Note (5): Radar pictures taken from NATS recorded radar do not show the Airprox. The

AIRPROX REPORT No 191/02.

H369 is clearly shown at 1420:45 squawking 7000 with NMC 2.1nm WNW of Redhill tracking SE about to enter the ATZ. At 1421:18 the Hughes is seen 1nm W of the airfield turning L, rolling out onto a northerly track for about 30 sec before commencing a R turn eventually steadying on a SSE track at 1422:03 0.5nm NW of Redhill. The R22 is seen for the first time at 1422:22 0.35nm W of Redhill 0.2nm NW of the H369 and just to the W of the Hughes' radar trail history.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

This incident highlighted a couple of salutary lessons that could be learnt when flying into an airfield. First was the need to use current aeronautical information pertaining to the intended flight. The procedures promulgated for Redhill require all VFR traffic to enter the ATZ via a notified VRP which the Hughes pilot seemingly was unable to comply with. When he called at the railway station, which he thought was at the old SW Corner VRP, the ADC was taken by surprise to see the Hughes just to the NW of the airfield, a lot closer to the cct than expected. Secondly, ATC had then issued him a conditional joining clearance, to follow the departing R22, which he also did not follow, as he was seen by the ADC to

cross the climb-out below cct height ahead of the R22. It was clear to members that the H369 pilot, by not following both the promulgated Redhill procedures and ATC instructions, had not integrated safely into the visual cct and it was this that had caused the Airprox.

The ADC had tried to pass the Hughes pilot instructions to enable him to fit into the cct pattern/sequence but he had then seen the H369 cross the climb-out ahead of the Robinson. The Hughes pilot had only seen the R22 as it passed to his L and 150-200ft below. The R22 pilot was also surprised by the H369's presence as he expected it to be joining the cct behind him. He had seen the H369 in his 2 o'clock range 500m on a crossing track R to L, with little time to take any effective action (and with limited options available to him). However, he had quickly realised that the ac were not going to collide and watched the Hughes cross ahead by 50m at the same level. This led the Board to conclude that, during a critical phase of flight, the subject ac had flown in such close proximity that safety had not been assured during the encounter.

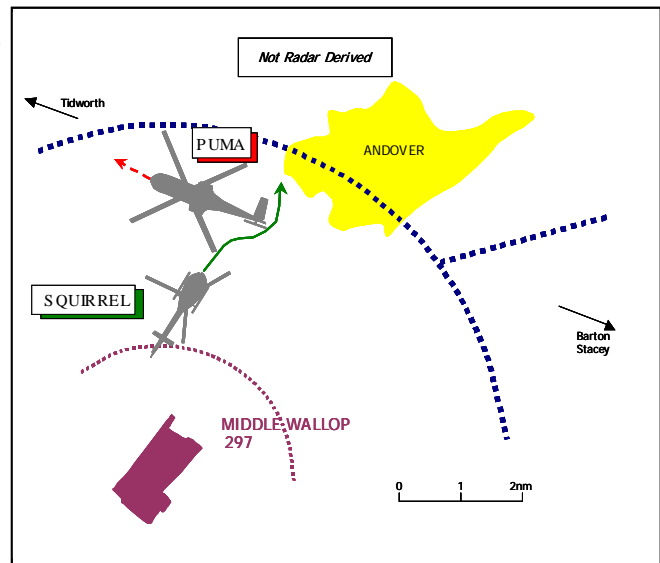
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: As a result of not following procedures and ATC instructions, the Hughes pilot did not integrate safely into the visual cct.

Degree of Risk: B

AIRPROX REPORT NO 192/02

Date/Time: 3 Oct 1913 Night
Position: 5111N 0132W (1.5nm SW Andover)
Airspace: UKNLFS LFA 1A/
 Middle Wallop (Class: G)
 MATZ
Reporting Aircraft Reported Aircraft
Type: Squirrel HT2 Puma HC1
Operator: HQ DAAvn JHC
Alt/FL: 500ft 500ft agl
 (QNH 1022mb) (Rad Alt)
Weather VMC CAVOK VMC
Visibility: Not Reported >10km
Reported Separation:
 75m H, Nil V Not Seen
Recorded Separation:
 NR

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

THE SQUIRREL PILOT, a QHI, reports that he was on an instructional NVG sortie from Middle Wallop. HISLs and navigation lights were selected on and he was in contact with Salisbury Ops on 252.9MHz, squawking SSR Mode 3/A code 2676 with Mode C. As he was leaving the Middle Wallop MATZ, hdg 030° at 500ft (QNH 1022mb) and flying at 100 kt, he spotted a Puma with an USL in his 10 o'clock, co-altitude, at 100m. He turned hard R to pass behind the Puma. He estimated that minimum separation distance was 75m and assessed that risk of collision had been high. The Puma was seen late as it was against the background luminescence of Andover.

THE PUMA PILOT reports that he was captain of one of a pair of Pumas operating out of Netheravon engaged upon an USL task between an HLS at Barton Stacey and another at Tidworth. He had HISLs and infrared formation lights selected on and was squawking SSR Mode 3/A code 7000 with Mode C. He called Salisbury Ops to notify that agency of his task and route and was advised to call Middle Wallop Approach. He established good 2-way R/T with Wallop Approach. He passed S of Andover level at 500ft (Rad Alt), flying at 70kt with an USL and, he thought, hdg 270°. He did not see the Squirrel.

THE MIDDLE WALLOP APPROACH CONTROLLER (APP) reports that at 1912 he received a call on 312.00MHz from the Puma pilot who advised that he was inside the Middle Wallop MATZ in the vicinity of Andover with an USL. He applied a FIS and passed the regional QNH. Conscious of the fact that his Aerodrome controller (ADC) had departures to the NE, he gave the Puma pilot traffic information on the subject Squirrel and an Apache. He then informed ADC of the Puma and the information was relayed to the Squirrel pilot. Shortly afterwards another Puma called on a similar sortie. Again he applied FIS, gave the regional QNH and passed traffic information. The Pumas were not booked into NFS LFA 1A nor had they been mentioned at the night flying brief so, at 1915, he rang Salisbury Ops to request further information. Whilst on the line to Salisbury Ops he heard the Squirrel pilot ask that unit if they were working the Pumas.

THE MIDDLE WALLOP AERODROME CONTROLLER reports that at 1913 he passed traffic information to the outbound Squirrel pilot on traffic in the vicinity of Andover believed to be a Puma. The Squirrel pilot acknowledged the call, reported that he was visual and changed to the Salisbury Ops frequency.

AIRPROX REPORT No 192/02.

MIDDLE WALLOP ATS CONTRACTOR conducted a formal investigation of Middle Wallop ATC involvement in the incident. The report summarises events as reported by APP and ADC and notes that the incident occurred shortly after commencement of night flying, therefore ATC had only been open a matter of minutes. Traffic density/complexity was not a factor.

It also reports that APP was working from a position in the Visual Control Room (VCR), adjacent to the ADC, and not the Radar Room; this is normal practice when a FIS only [non-radar] service is being provided. Also in the VCR was the Watch Supervisor who, having heard the exchange of information between the Puma pilot and APP and being alert to the potential conflict, advised ADC to inform the Squirrel pilot of the presence of the Puma. The Squirrel pilot made no mention of the occurrence on RT.

Additionally the report draws attention to the fact that Salisbury Operations is the controlling authority for all movements within LFA 1A at night and that the Puma did not appear on the night flying programme produced by Salisbury Ops, which was included in the Middle Wallop night flying briefing for that evening.

UKAB Note (1): Analysis of the RTF transcript for Wallop Approach frequency, 312:00MHz, reveals that the Puma pilot called Wallop APP just after 1912 stating: "... a Puma with 3 POB currently with load for (unreadable) 1½, er, load task between Barton Stacey and Tidworth (1912:30 time signal) Barracks, we're planning to route S of Andover, backwards and forwards for the next 1 hr 30min up to 1000ft.". APP responded by placing the Puma under FIS and passing the Portland RPS, 1022mb. The Puma pilot acknowledged both. APP then transmitted "And c/s traffic information for you is 1 Squirrel helicopter and 1 Apache helicopter just departed Middle Wallop tracking to the NE initially out towards your direction Andover before changing to Salisbury (1913 time signal)". The Puma pilot responded that he was looking for the traffic. Three min later the Puma pilot called APP again to report that he had a change of intentions and that he would "... start routeing to the N of Andover out of the way of your traffic and, er, we'll stick with Salisbury Ops."

UKAB Note (2): Analysis of the RTF transcript for Wallop Tower frequency, 118.275MHz, reveals

that the Squirrel took off from Middle Wallop at about 1910:30 and departed via the Hurst Gate after a R turn out. At 1913:30 ADC transmitted "... there is traffic, believed a Puma, in the vicinity where you're actually hdg at the moment actually talking to the Approach controller. Yeah we didn't know about him until the last minute." The Squirrel pilot responded "Roger c/s I've got traffic in my, er, L 10 o'clock. Er, I've got him in sight." Immediately afterwards the Squirrel pilot reported approaching the MATZ boundary and changing to Salisbury Ops. ADC acknowledged and passed the Portland RPS, 1022mb.

UKAB Note (3): In a telephone conversation with Salisbury Ops it was established that:

Salisbury Ops publishes its night flying programme at 1400 (local). The Squirrel was on the published programme, but not the Pumas. It was suggested that this might have been the result of late tasking for the Pumas, possibly associated with a large-scale air mobility exercise then in progress for which a block approval, in principle, had been issued.

The subject Puma contacted Salisbury Ops as reported.

At the time of the incident, Salisbury Ops was not equipped with radar.

UKAB Note (4): UK MIL AIP Vol 3 Sect 3 states:

"15. In order to allow helicopters to operate using night vision goggles (NVG) within LFA 1A special rules are in force and 5 NVG corridors cross the Area which is divided into 7 NVG sub-areas. ...".

"16b. During planned night flying Salisbury Ops is manned and responsible for co-ordination of all military traffic on Salisbury Plain Training Area and in LFA 1A. All ac are to call Salisbury Ops on Freq 282.25 MHz when entering and leaving the LFA, ...".

"18. **NVG Corridors and Areas.** All crews are warned that ac may be operating with no or reduced lighting. To deconflict ac flying using NVGs the following regulations apply:

b. (2) **Lighting.** LFA 1A is a permanent restricted/ no lights area for military helicopters operating

below 500ft AGL. This type of activity is booked in advance with Salisbury Ops."

"21. Night Bookings. *All crews who intend to night fly are to obtain night flying clearance in advance from Salisbury Ops. Once booked, any amendments to the night programme are to be made through Salisbury Ops."*

"22. SPTA Air Danger Areas. *Separate rules apply for night flying within the air danger areas and these are published in SPTA Standing Orders Pt 4. However, ac in transit through the LFA to and from the danger areas are to obtain clearance in advance for LFA 1A."*

"23. Night Flying Briefing. *After initial clearance, all stations or aircrew intending to night fly in LFA 1A or the SPTA are to confirm their intentions with Salisbury Ops by 1300 local on the day concerned or the last working day prior to a weekend or public holiday. Once this has been done a consolidated LFA 1A night briefing will be faxed or telephoned to all units flying in the area."*

"24. Night Helicopter Landing Sites (HLS). *Where a pre-arranged field HLS is in use, all military ac are to avoid the site by 3 km. HLSs will be notified to night users of LFA 1A at the night briefing."*

HQ DAAvn comments that the Squirrel crew was conducting a properly authorised serial of the Army Pilot's course and departing in accordance with well-established local procedures. Despite the obvious difficulties in acquiring the Puma, the fact that they did acquire it late and avoid collision is commendable. The speedy reaction by ATC in issuing a warning call is equally commendable in its contribution to preventing a collision. The poor route planning, airmanship and notification procedures displayed by the Puma crew undoubtedly contributed to the creation of this dangerous encounter.

JHC comments that the Pumas were not on the night flying programme issued by Salisbury Ops, although that agency was aware of the large-scale air mobility exercise in LFA 1A for which block-booking approval had been issued. Therefore, it would seem prudent to have included this information on the consolidated night flying programme. This would have alerted Middle

Wallop ATC and the Squirrel crew to the likelihood of increased traffic in the area.

A factor in this Airprox was the ac operating on different frequencies in the same airspace. Whilst Salisbury Ops is the controlling authority for all traffic in LFA 1A at night, Middle Wallop MATZ is notified as H24 with frequent night flying. Therefore, the Puma pilot should not have entered the MATZ without prior approval from Middle Wallop ATC. Indeed, he only elected to speak to Middle Wallop once inside the MATZ and when prompted to do so by Salisbury Ops.

This Airprox highlights the difficulty in visually acquiring other ac at night, especially when viewed against the backdrop of a well-lit town. It is fortunate that the Squirrel pilot saw the Puma and took avoiding action, a move that might not have been necessary were it not for what seems to have been a basic, procedural error by the Puma crew.

UKAB Note (5): The reported incident occurred below the coverage of LTCC radars and consequently corroborating recorded radar data is not available.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The HQ DAAvn member advised the Board that, following further discussion with the Squirrel pilot, it now seemed possible that the reported encounter had been with the second rather than the lead Puma. Nevertheless, the incident location was, as stated, within the MATZ boundary. Members noted this possibility. Attention focused upon what the respective pilots could have seen. It was acknowledged that flare from the background lights of Andover produced by his NVG would have disadvantaged the Squirrel pilot in his visual acquisition of the Puma. The Puma pilot would have been in a better position to see the Squirrel, especially as the Squirrel's HISLs should have been visible against a darker background. Members also noted that,

AIRPROX REPORT No 193/02.

despite regulations to mitigate such problems, requisite night airspace co-ordination in respect of the Pumas appeared to have been defective. However, members discounted this as a contributory cause. Rather, they were unanimous in the opinion that the encounter resulted from the Puma(s) entering the Middle Wallop MATZ before establishing contact with Middle Wallop Approach.

Members questioned the prudence of Middle Wallop conducting night flying with Approach operating from the VCR in a procedural rather than radar mode. Civil ATC members suggested that this was not unusual in civil applications, although military ATC members said they did things differently. All were agreed, however, that non-availability of radar denied both pilots an important safety net, especially as the Squirrel crew were operating under NVG.

Members had some difficulty in understanding the geometry of the encounter. Given that the Puma had apparently already crossed ahead when first sighted by the Squirrel pilot, they wondered why the latter had taken such a robust turn away from it. However, the MSD stated by the Squirrel pilot together with the knowledge that the Puma pilot had not seen the Squirrel convinced the Board that a risk of collision had existed.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause:

- Puma pilots(s) entered MATZ before calling Middle Wallop ATC.
- Non-sighting by the Puma pilot and effective non-sighting by the Squirrel pilot.

Degree of Risk: A

AIRPROX REPORT NO 193/02

Date/Time: 30 Sep 1115

Position: 5111N 00101W (0.6nm E of Lasham - elev 618ft ft)

Airspace: Odiham MATZ/ (Class: G)
London FIR

<u>Type:</u>	<u>Reporting Aircraft</u>	<u>Reported Aircraft</u>
Schleicher	AS-K21 Glider	BE58

Operator: Civ Club Civ Pte

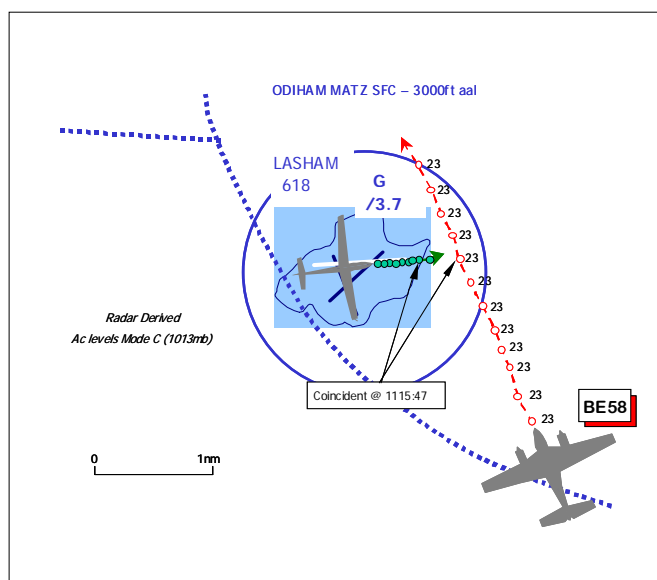
Alt/FL: 2000ft 2500ft
(QFE 993mb) (QNH 1022mb)

Weather: VMC VMC

Visibility: 20nm 20km

Reported Separation:
700ft H, Nil V 1nm H, Nil V

Recorded Separation:
0.33nm H, NR V



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE K21 GLIDER PILOT reports that he was hdg 090° at the end of a winch launch having reached

2000ft (Lasham QFE 993mb) and was at point of release flying at 50kt when a low-winged twin

crossed 700ft ahead from R to L at the same height. No avoiding action was taken as the other ac, which he thought was French-registered, had already crossed the nose when first sighted. He assessed that the risk of collision had been high. He adds that his glider was coloured silver and that he was not in receipt of an ATS.

THE BE58 (BARON) PILOT reports that his ac was coloured white with red, blue and silver stripes. Red anti-collision beacon and HISLs were selected on. He was inbound to Oxford from Le Castellet, routeing GWC – CPT, at 2000ft (Farnborough QNH 1022mb), he thought, hdg 338° at 175 kt and was in receipt of a FIS from Farnborough on 125.25MHz and squawking SSR Mode A code 0434 with Mode C. About 1.5nm SE of Lasham, Farnborough advised him of 2 contacts. Both were seen; one was a glider low in his 11 o'clock hdg W and the other, also a glider, was near the end of the climb on winch take-off. No avoiding action was necessary in respect of the latter as he assessed that because of the glider's slow speed he would pass in front at a safe distance.

THE FARNBOROUGH LARS CONTROLLER reports that the BE58 pilot called at 1110 on 125.25MHz for a FIS when passing the GWC VOR and descending to 2500ft (Farnborough QNH 1022mb). The ac was identified, and the pilot placed under FIS and given penetration of the Odiham MATZ at 2500ft. The pilot was then advised to keep a good lookout as he passed Lasham Airfield and traffic information was passed on 2 contacts believed to be gliders; one was in the Lasham overhead and the other 1nm N of Lasham, both manoeuvring. The BE58 pilot reported good contact. At 1119 the BE58 pilot was instructed to squawk A7000 and to freecall Brize Radar on 134.3.

FARNBOROUGH ATS UNIT INVESTIGATION concludes that the BE58 was the reported ac and that the pilot, when warned of his vicinity to Lasham and the 2 contacts, replied good contact.

ATSI reports that a glider operating from Lasham reported an Airprox to Farnborough. Analysis of the radar and RTF recordings show only one possible ac, a BE58 en route from Le Castellet to Oxford/Kidlington, which may have been the other ac involved. This was in receipt of a FIS from Farnborough, whilst en route between GWC and

CPT, and was advised of Lasham's activity as well as being passed traffic information on suspected gliders. The pilot reported the gliders in sight and maintained a safe separation. In the glider pilot's report he identified the ac as a French registered twin, however, the Farnborough traffic was UK registered. No ATC causal factors detected.

UKAB Note (1): UK AIP ENR 5-5-1-3 promulgates Lasham as a Glider Launching Site "By winch/ground Tow and tug aircraft/motor glider with vertical limits 3000ft agl, site elevation 618ft amsl and active sunrise to sunset."

UKAB Note (2): UK AIP ENR 2.2 states at para 2.2: "The ATS Unit providing a MATZ Penetration Service will give traffic information and any instructions necessary to achieve safe separation from known or observed traffic in the zone. The service will, whenever possible, be based on radar observations and either a Radar Advisory or Radar Information Service will be given. When radar separation cannot be applied, vertical separation of at least 500 ft between known traffic will be applied. When safe lateral or vertical separation cannot be achieved, pilots will be advised to avoid the MATZ." law para 4.1, Farnborough provides a MATZ Penetration Service for the Odiham MATZ on 125.25MHz. Furthermore, law para 2.4, exceptionally within the Odiham MATZ the transit pressure setting is the Farnborough QNH.

UKAB Note (3): Analysis of the Heathrow (23cm) radar data recording reveals that at 1115:19 the BE58, squawking SSR Mode A code 0434 with Mode C displaying 023, is 2nm SE of Lasham tracking NW. Track and level of the BE58 are maintained. Given that the Lasham QFE was 993mb, 023 on Mode C (1013mb) equates to a height of 1700ft above Lasham. At 1115:23 a primary return paints overhead Lasham tracking E, consistent with the glider pilot's report. CPA occurs at 1115:47 when the BE58 is E abeam Lasham at which point minimum recorded H separation is 0.33nm. Thereafter, the tracks diverge as the BE58 continues on its NW track.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac, transcript of the relevant RT

AIRPROX REPORT No 193/02.

frequency, radar video recording, reports from the air traffic controllers involved and reports from the appropriate ATC authorities.

A GA pilot member noted that the BE58 pilot, in electing to fly a direct track between GWC and CPT VORs at 2500ft (Farnborough QNH), flew through the notified Lasham gliding site; this despite being warned by the Farnborough LARS controller of Lasham activity. Some pilot members asked whether the Farnborough controller could, or should, have done any more to prevent incursion by the BE58 pilot or, alternatively, provide a warning to Lasham. ATC members were of a counter-opinion, stating that the Lasham glider-launching site is well promulgated and active throughout the year. Therefore, in their opinion, onus was upon the BE58 pilot to have been aware of the proximity of Lasham in relation to his planned route.

Members acknowledged that whilst the BE58 pilot was entitled to be in the vicinity of Lasham and, having been warned by ATC, saw the glider, they were unanimous in the view that it was not good airmanship to have flown so close to the latter;

especially because the glider was in the process of being winch-launched and was still attached to the cable. One GA pilot member wondered, given the good visibility, whether the launch party had been in a position to stop the launch had they seen the approaching BE58; unfortunately UKAB had no information to confirm or deny this. Members were agreed, however, that the encounter was the result of the BE58 pilot flying through the notified glider-launching site. As regards risk, members noted that neither pilot had to take avoiding action and the recorded separation had been some way removed from their separate estimations. Accordingly, members were persuaded that no risk of collision had existed.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The BE58 pilot flew through a notified gliding site into conflict with the K21 glider that was on the point of release from the launch cable.

Degree of Risk: C

AIRPROX REPORT NO 194/02

Date/Time: 7 Oct 1008

Position: 5145N 0402W (6nm NNE Swansea
- elev 290ft)

Airspace: FIR/UKLFS (Class: G)

Reporting Aircraft Reported Aircraft

Type: BH06 JetRanger Dominie T MK 1

Operator: Civ Comm HQ PTC

Alt/FL: 500ft 500ft

(RPS 1014mb) (msd)

Weather VMC CLBC VMC CLBC

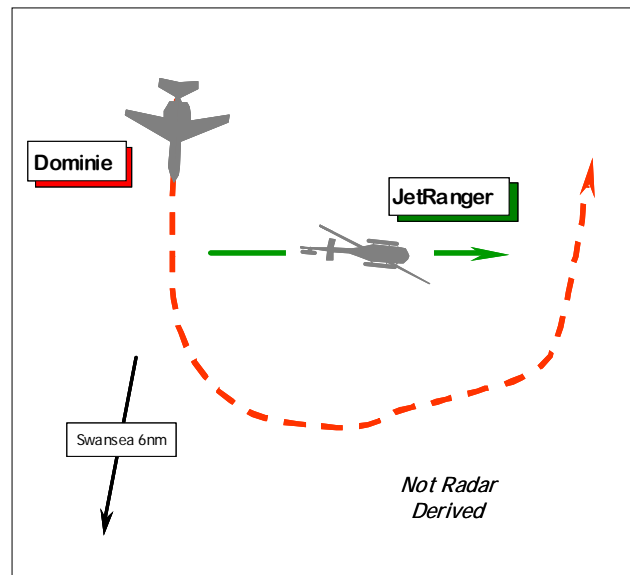
Visibility: 30km >10km

Reported Separation:

100m H, nil V 800m H, nil V

Recorded Separation:

Not Recorded

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

THE BH06 JETRANGER PILOT reports that he was engaged in a pipeline inspection and was flying at 500ft RPS 1014mb and 90kt, on a heading of about 100°. His helicopter was coloured silver, with anti-collision beacons, position lights and HISLs all on. He was squawking with Mode C, but TCAS was not fitted. Swansea Approach, where the helicopter was due to land, was providing a FIS on 119.7MHz. The other ac, identified as a black and white low wing, twin engined executive jet, was first seen as it passed across the helicopter's 12 o'clock R to L at a range of about 100m. The ac appeared to be flying with the starboard wing low. The only avoiding action possible was a slight turn to the right, but the other ac had passed almost immediately, with a risk of collision assessed as "medium/high". The pilot reports that a PINS had been filed and both occupants would be concentrating on the pipeline as well as looking out. Being in close proximity to an airfield, he would have hoped to have received a position report on the other ac.

UKAB Note (1): Low Flying Booking Cell reports that the PINS area in which the Airprox took place was not active at the time of the Airprox. The nearest active area was about 15nm to the E.

THE DOMINIE T MK 1 PILOT reports that he was flying as a singleton on a low level navigation exercise at heights between 250ft and 500ft msd, and at 210kt. His ac was coloured black and white, with HISLs selected on. He was squawking 7001 with Mode C and was not receiving an ATS; TCAS was not fitted. The Dominie had just overflown a target on a southerly heading and had commenced a L turn onto NE when a helicopter, described as blue/white or green/white, was seen in the 9 o'clock position slightly high. It was about 800m away and appeared to be heading generally easterly. He climbed to ensure continued vertical separation, reduced the angle of bank and rolled out of the turn early onto E to remain clear laterally. Once well ahead and with clearance assured he continued the turn onto his required heading. During the turn the pilot "waggled wings" to indicate that he had seen the helicopter and would remain clear. The minimum separation was assessed as 800m laterally, same height, and risk of collision assessed as "absolutely none".

THE DOMINIE PILOT'S UNIT comments that the pilot saw the helicopter in time to take prompt and appropriate avoiding action that maintained adequate separation. The incident reinforces the importance of maintaining a good lookout at low-level, particularly during high workload phases of the sortie.

AIRPROX REPORT No 194/02.

HQ PTC comments that without any radar corroboration, this seems to have been a routine "see and avoid" encounter within the limits of the UKLFS. The Dominie pilot is in no doubt that he saw the helicopter at a good enough range to be able to avoid and acknowledge it, with the minimum of drama and no risk of collision. We suspect that the helicopter pilot saw the Dominie somewhat later in the encounter.

UKAB Note (2): This Airprox occurred below the coverage of recorded radar.

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.

Although there was a discrepancy between Dominie pilot's description of the BH06 and its actual colours, there was no doubt that the correct two ac involved had reported. However, members were unable to resolve the two pilots' respective separation estimates. Without any other hard information available to support either estimates, only the aircrew involved knew how close the ac actually passed. In previous cases, with the benefit of corroborating information, the distance involved had usually been found to be somewhere near the average of both sighting distances, but this was not always the case. One lesson to be learnt from the helicopter pilot's report was the mistaken expectancy of receiving TI when under a FIS. This level of ATC service only provides basic information of a general nature (weather etc) combined with an alerting service. Any information passed would usually be generic (notified gliding or Danger Area activity), and TI on ac in the local area should not be expected as a norm. It is not always practical for ac to make blind/courtesy calls to ATSUs adjacent to their route but there was no doubt it would have been useful in situations like this one. Also noteworthy was the belief of the JetRanger pilot that his flight was notified under PINS which had subsequently been found to be in error. Taking a broad overview of this encounter, there had been equal onus on both pilots to 'see and avoid' flying in the open FIR. The helicopter should have been visible to the Dominie pilot prior to the turn as he

was responsible to clear the area of intended flight path into which he would turn; the BH06 would have been a small target, tail on, but the opportunity to have seen it earlier was there nevertheless. The helicopter had been approached from behind and abeam and this would have made earlier visual acquisition of the Dominie difficult. Experience from many similar incidents shows that when other ac are seen very late the "shock" factor often makes range estimation difficult with ranges being frequently underestimated which may or may not have been a factor here. In the end, faced with contradictory information, members agreed the cause of this Airprox had been the Dominie's flight path which had caused concern to the JetRanger pilot.

From the BH06 pilot's perspective, he had acquired the Dominie late, as it was about to pass 100m, he thought, in front R to L, and had initiated a slight R turn. He had made no mention of needing to take aggressive avoiding action or whether he had flown through the Dominie's jet wake. The Dominie pilot had spotted the JetRanger well beforehand and said he had altered his flight path to ensure that the two ac were not going to collide. However, he had chosen the separation distance (800m he thought) by which to avoid the helicopter which he had considered more than adequate. Some members thought the Dominie pilot should have 'built in' some vertical separation as well, instead of relying on separation just in the horizontal plane. It was impossible for both pilot's estimates to be correct and the discrepancy remained unresolved. The Dominie pilot had acquired the BH06 to his L and had adjusted his flight path to avoid by a 'safe' margin and was always in a position to manoeuvre further if necessary whilst maintaining visual contact. On this limited information and reiterating that only the pilots concerned knew the actual separation, the Board concluded that there had not been a risk of collision in this avoidable situation.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Dominie's flight path caused concern to the JetRanger pilot.

Degree of Risk: C

AIRPROX REPORT NO 195/02

Date/Time: 5 Oct 0941 (Saturday)

Position: 4501N 0900W (15nm N BEGAS
(145nm N of Santiago, Spain))

Airspace: OCA (Class: A)

Reporting Aircraft Reported Aircraft

Type: A321 B737-800

Operator: CAT CAT

Alt/FL: FL360 FL360

Weather IMC NR IMC IICL

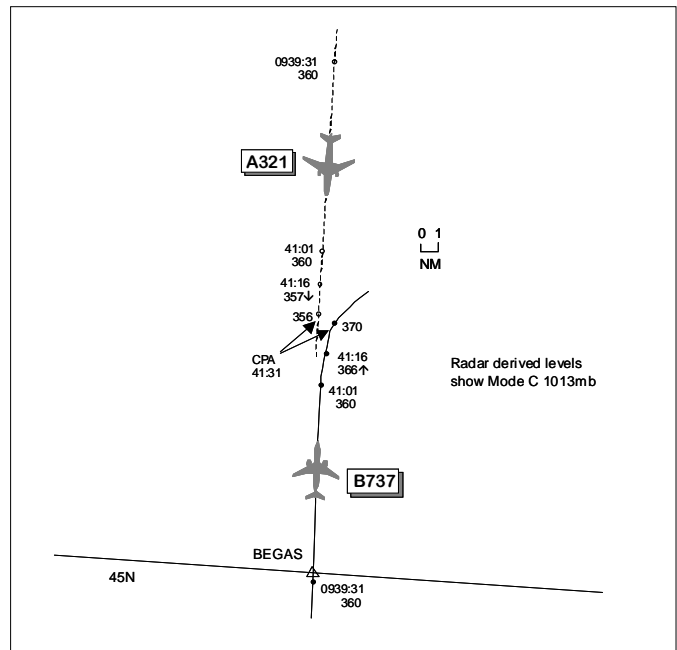
Visibility: 5km 5km

Reported Separation:

0.5nm H, 300ft V NR

Recorded Separation:

0.9nm H 1400ft V

**BOTH PILOTS FILED****PART A: SUMMARY OF INFORMATION REPORTED TO UKAB**

THE A321 PILOT reports that he was southbound on T9 at FL360, en route to Faro. He was flying in accordance with his Oceanic clearance, as issued by Shanwick, which was "LASNO-BEGAS-STG; from LASNO, FL360, M0-78". Approaching BEGAS the crew received a TCAS Traffic Alert (TA) on opposite direction traffic. This was followed rapidly by a Resolution Advisory (RA) with "Descend, Descend" aural warning. Autopilot was disconnected and the RA followed, max ROD 1100fpm, deviating about 800ft from assigned level. The conflicting ac was seen to alter course to starboard, passing 0.5nm horizontally and 300ft vertically above, but it was not known whether it had changed level; "clear of conflict" was received and he returned to his cleared level of FL360. He reported the incident to Shanwick on HF RT and again to Madrid on VHF RT and assessed the risk of collision as high.

THE B737 PILOT reports that he was northbound at FL360 en route to Dublin and he was receiving a Radar Control Service from Madrid ACC on VHF. He had earlier received an Oceanic clearance from Shanwick (via HF) to cross BEGAS at time 0941, maintaining FL370 and

M0-79; this had been received 50min before MNPSA entry at BEGAS, and was later confirmed by Madrid via VHF. Madrid instructed him to maintain FL360 and await clearance to FL370 before BEGAS, but this clearance was never given. At 0939 the crew were instructed by Madrid to turn R onto 090° and contact Shanwick on HF, but no climb instruction was given. At the same time, he received a TCAS TA, followed quickly by a "CLIMB" RA with associated aural warning. The incident was reported to Madrid who advised that there had been a co-ordination problem between Madrid and Shanwick. The ac was flying in the "cloud tops" and the opposing traffic was not seen. The pilot estimated that the separation had been very little, as the other ac's wake was encountered during the "escape manoeuvre". Risk of collision was assessed as "high".

UKAB Note (1): The B737 pilot reported that the Airprox took place 15nm S of BEGAS, and submitted the required reports to the Spanish Authorities. The bulk of the information provided to the UKAB was in the form of a translation of this report, originally completed in a foreign language,

AIRPROX REPORT No 195/02.

provided by the B737 pilot's airline Flight Safety Manager.

ScOACC ATS INVESTIGATIONS reports that the B737, northbound from Gran Canaria to Dublin via oceanic route T9, was reported by Madrid to be entering oceanic airspace at BEGAS (45N9W) from Madrid UIR at FL360 although the cleared oceanic level passed to Madrid by Shanwick had been FL370. This brought the ac into conflict with an opposite direction A321 which was also cruising at FL360 en route from Manchester to Faro on T9. Recognising an imminent loss of separation, Madrid phoned Shanwick asking that the A321 be descended to FL350 but by the time the message had been transmitted, the A321 had passed the opposing B737 and was already in Madrid's airspace. The pilot reported that the B737 had passed 0.5 mile away alongside. The B737 pilot stated after the event that he had commenced climb to FL370 with 4nm to run to BEGAS.

At 0852 Shanwick sent Madrid ACC an Oceanic Clearance Message (OCM) for the B737, authorising the ac to enter oceanic airspace at BEGAS at 0941, FL370 routeing LASNO-CRK. This signal was acknowledged by Madrid at 0853, the same time Shanwick cleared the B737 on HF (via Ballygirreen) to route BEGAS-LASNO-CRK, from BEGAS to maintain FL370, M0.79. This was read back correctly by the pilot.

At 0911 an Activation Message (ACT) was transmitted to Madrid by FDPS, indicating that the A321 was estimating BEGAS at 0941 at FL360. At 0919 an ACT was received from Madrid stating that the B737 would enter Shanwick airspace at BEGAS at 0941 and FL370 (i.e. the correct, cleared level).

At 0938 the Shanwick En Route controller received a phone call from Madrid, who said *"...It's reference the (B737 C/S) and you've got another traffic opposite direction maintaining 360 please descend it **right now** even (B737 C/S) or the other one level 35. There is one squawking 4463 **right now** descend it."*

There was then an interchange between Shanwick and Madrid:

Shanwick: "Affirm, that's the (A321 C/S)".

Madrid: "Yes but descend it now it's the same level 360 opposite direction".

Shanwick: "Yes the (B737 C/S) has his ocean clearance at FL370."

Madrid: "I'm sorry it was my fault I'm so sorry but descend it **now**."

Shanwick: "What level's the (B737 Co C/S) going to?"

Madrid: "35 **right now** 350 (A321 Co C/S)."

Shanwick: "The (A321 Co C/S)'s going to 350?"

Madrid: "**Right now, Right now**".

The conversation between Madrid and Shanwick continued. Owing to the Madrid controller's English, the Shanwick controller was under the impression that Madrid was in direct RT communication with the A321 which at this point was at, or very close, to the Madrid UIR entry point at BEGAS, and that Madrid were asking for permission to descend it themselves to FL350. The Shanwick controller authorised Madrid to descend the A321 to FL350 (whilst believing that the B737 was at FL370 as cleared) and then authorised the B737 to be descended to FL360 subject to the A321. It was only after further exchanges that Shanwick realised that Madrid was asking Shanwick to descend the A321.

At 0940 Shanwick dictated a message for Ballygirreen to descend the A321 to FL350. In a subsequent telephone conversation direct with Ballygirreen at 0943, the Communicator said that the A321 was still maintaining FL360 and asked Shanwick to confirm the instruction to descend it to FL350. The Shanwick controller replied that if the A321 was speaking to Madrid it should not be given the descent instruction. At 0944 Ballygirreen told Shanwick that the A321 was now contacting Madrid and Shanwick said that the ac could now disregard the clearance from Oceanic as the pilot would get instructions from Madrid.

Meanwhile, in respect of telex signals between the two ATC units and between Shanwick and Ballygirreen, at 0940 Madrid queried the A321's level as it had opposite direction traffic at FL360. At 0943 Shanwick (as a result of Madrid's request

for an urgent level change for the A321) passed an instruction for the A321 to descend to FL350 - "avoiding action". The ac immediately replied: "Too late, traffic has passed us at same level, maintaining now FL360". However, in its position report via Ballygirreen timed at 0946, the B737 pilot stated that he crossed BEGAS at FL370 at 0940. In response to a further query by Shanwick at 0956, the B737 pilot said that he had climbed to FL370 four miles before BEGAS. The A321 pilot advised that he would be filing an Airprox.

The Activation Message received from Madrid stated that B737 was at FL370. This implied that the Madrid controller had manually updated the ACT parameters to reflect the level required at BEGAS but subsequently did not implement the level change. In his telephone call to Shanwick at 0938 the Madrid controller admitted to making a mistake.

The B737 pilot had reported climbing to FL370 four miles before BEGAS and the A321 pilot stated that the opposing traffic had passed at the same level (FL360), suggesting that the two ac passed while within Madrid's airspace. However, in his telephone message timed at 0940 the Madrid controller stated that both ac were at FL360.

It remained unknown why the Madrid controller had not issued avoidance turn instructions directly to the B737 when it was recognised that vertical separation had not been achieved; he had instead concentrated on asking Shanwick to change the level of the A321.

Time was lost in responding to Madrid's urgent calls because of language difficulties; the Shanwick controller was uncertain about what he was being asked to do. In the event it is questionable whether Shanwick could have conducted an FDPS probe at FL350, passed an instruction via Ballygirreen, and actually achieved the level change within the time available in order to avoid this Airprox.

There are no implications in respect of ScOACC procedures. Head of Operations, Madrid ACC has been requested to provide comment on the Airprox from the Madrid perspective and a response is still awaited.

ATSI endorsed the ScOACC report.

UKAB Note (2): Analysis of recorded radar images provided by Madrid shows the B737 crossing BEGAS at time 0939:31. At 0941:01 the B737 is northbound on T9 at FL360, 11.7nm N of BEGAS, with the A321 opposite direction, also at FL360, at range 7.7nm. The next image, at 0941:16, shows the ac 4.07nm apart, with the B737 apparently just commencing its R turn. Both ac are reacting to TCAS at this stage, with the B737 indicating FL366 climbing and the A321 indicating FL357 descending. The two ac pass with an estimated 0.9nm lateral separation, with the B737 at FL370 and the A321 at FL356. Precise measurement of lateral separation is difficult owing to limitations of the imagery, but is probably ± 0.2 nm. The ac passed each other 15nm N of BEGAS.

UKAB Note (3): The UK AIP ENR 2-2-4-5 Shanwick Oceanic Control Area (North Atlantic Region-NAT) Section 7 Clearance Para 7.2 states:- *"A clearance issued by Shanwick is effective at the Shanwick OCA Boundary. Pilots must ensure that they comply with this clearance, especially that the flight crosses the Shanwick OCA Boundary at the flight level contained in the clearance issued by Shanwick. For flights entering Shanwick OCA from domestic airspace, it is the responsibility of the pilot to obtain from the appropriate ATC authority any necessary clearance or re-clearance to enable him to comply with the Oceanic Clearance or, when necessary, remain clear of Oceanic Airspace whilst awaiting Oceanic Clearance."*

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac, an uncertified transcript of the ScOACC telephone communications, radar photographs, reports from the air traffic controllers involved and reports from the appropriate ATC and operating authorities.

Members initially focused on the pilot aspects of the incident. Although it was reported by the B737 crew as occurring 15nm S of BEGAS, the radar had shown the conflict 15nm N of BEGAS, within the Shanwick OCA. Moreover, the B737 crew had erroneously reported, via Ballygirreen, that he had crossed BEGAS at FL370, having climbed with 4nm to run, which was not borne out by the radar

AIRPROX REPORT No 195/02.

data provided from Madrid. Although the B737 crew had requested a climb to FL370 from Madrid ACC, they had been told to maintain FL360 and await further clearance. Procedures for the Shanwick OCA clearly places the onus on aircrew to ensure compliance with their Oceanic clearance at the boundary. It was felt there had been sufficient time for the B737 crew to ask again for climb clearance, when it was not forthcoming from ATC, as they had approached BEGAS. Instead, the B737 had continued to BEGAS and entered the OCA at the incorrect level, contrary to the acknowledged ScOACC clearance. This action had been a part cause to the Airprox. However, the Madrid ACC controller had sent an ACT message over 20 min prior to the incident stating that the B737 would enter ScOACC airspace at FL370; the controller was aware of the opposite direction A321 at FL360 from a previously received ACT message from ScOACC. Therefore, members concluded that the controller had allowed the B737 to cross into the Shanwick OCA, contrary to previously agreed co-ordination with Shanwick, which was also a part cause of the Airprox.

The Madrid ACC controller had been the only person aware of the impending confliction, since the Shanwick ERC believed that the B737 was at its assigned level of FL370. For 2-3 min prior to the Airprox, the Madrid controller had tried to resolve the confliction by telephone with the ERC which unfortunately was unsuccessful. For whatever reason, the Madrid controller had then turned the B737 R 90° and transferred it to

Shanwick on HF. At about the same time, TCAS had begun to alert both crews to the situation. After the initial TA alert, the A321 crew had reacted quickly to the RA “*descend*” command and whilst following the guidance, visually acquired the B737, watching it pass 0.5nm to the L and 300ft above. The B737 crew also received a TA warning followed by an RA “*climb*”, which was followed. The radar shows the B737 climbing in response to TCAS but only a slight deviation to the R is noted at the CPA, presumably as the ac was initiating its R turn as instructed by Madrid - radar does not show the B737 crossing through the A321’s track/wake as was reported. Members were clear that this had been a potentially serious incident involving a significant loss of separation - both ac were head-on, less than 8nm apart, with a closing speed of just under 900kt, at the same level. Fortunately, the last ‘safety net’ of TCAS had worked and the pilots had ensured that the ac were not going to collide. However, the Board were clear that both ac had been exposed to unnecessary risk during the encounter to the extent that safety had been seriously compromised.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Madrid ACC and the B737 crew did not ensure that the Oceanic Clearance was complied with.

Degree of Risk: B

AIRPROX REPORT NO 196/02

Date/Time: 8 Oct 0840

Position: 5240N 0120W (10nm S of East Midlands Airport - elev 306ft)

Airspace: Daventry CTA (Class: A)

Reporter: East Midlands APR

	<u>First Aircraft</u>	<u>Second Aircraft</u>
<u>Type:</u>	Airbus A321	Falcon 900
<u>Operator:</u>	CAT	Civ Comm
<u>Alt/FL:</u>	↑FL80	↓FL60

Weather: NR VMC CLAC

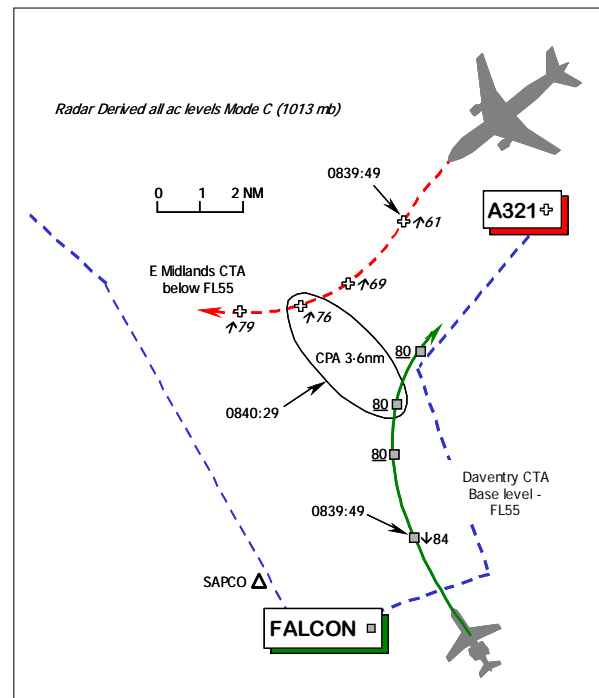
Visibility: NR 10nm+

Reported Separation:

NR 4nm H, 900ft V

Recorded Separation:

3-6nm H, 400ft V

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

THE EAST MIDLANDS APPROACH RADAR CONTROLLER (E MIDLANDS APR) reports that the departing Airbus A321 was transferred by the ADC direct from TOWER to the MACC TRENT Sector passing 2000ft ALT. TRENT Sector requested an inbound level for the Falcon 900 when it was about 30nm S of E Midlands Airport, on a northwesterly heading descending through FL90 at high speed; FL60 was assigned routeing towards the EMW. At this point the Airbus was passing FL48 on a DTY2P SID and on track. Subsequently, the Falcon crew was given an avoiding action R turn onto 020° and descent stopped at FL80. Minimum horizontal separation was 4nm and standard minima was not eroded, he thought, only as a result of his avoiding action turn and the subsequent avoiding action turn issued to the Airbus crew by the TRENT SC.

UKAB Note (1): ATSI advises that the E MIDLANDS APR was required to apply 5nm horizontal separation in these circumstances.

THE A321 AIRBUS PILOT believes that the situation was controlled sufficiently by the avoiding action instruction issued by the TRENT

SC, which in his opinion prevented an Airprox. Therefore, he did not submit a report.

THE FALCON 900 PILOT provided a very comprehensive report, stating that his ac has a white colour scheme and the HISL was on whilst inbound to E Midlands from Bari. TCAS is fitted. Whilst under their control, London CONTROL instructed him to descend to FL100 and "maintain speed greater than 300kt". After handover to Manchester, he thought they instructed him to maintain speed at 300kt and descend to FL80, thereafter to FL60 and turn towards the EMW NDB – the heading to the EMW was about 350°, before switching to E Midlands APPROACH. Shortly after APPROACH acknowledged his initial call, the controller instructed him to maintain FL80 and turn R onto a heading of 020° for avoiding action. At that point his ac was descending quite rapidly through about FL85 and the descent was arrested with a "shoot-through" of only 50ft. Immediately after the ATC instruction was transmitted, TCAS issued a TA; he assessed the CPA to the other ac was about 4nm and minimum vertical separation was about 900ft. Because of the proximity of cloud tops, the other ac was not

AIRPROX REPORT No 196/02.

sighted until it was abaft the port beam when both ac were diverging. At that point it was not possible to identify the other ac, but it was a twin-jet airliner with engines slung under the wings. He assessed the risk of collision would have been high if he had not complied with the avoiding action instructions issued by ATC.

THE MACC TRENT SECTOR RADAR CONTROLLER (TRENT SC) provided a frank and concise report that the Falcon inbound to E Midlands, IFR, under a RCS was descended to FL80 and then to FL60, before being transferred to E Midlands APPROACH. The outbound Airbus also under a RCS, IFR, was climbed to FL80 against overflying traffic at FL90 routeing LIC-DTY, but he had not taken the Falcon into account when he climbed the Airbus. The STCA triggered; he issued avoiding action to the Airbus crew and E Midlands APPROACH gave avoiding action to the Falcon crew.

THE MACC TRENT SECTOR CO-ORDINATOR (TRENT CO-ORD) reports that the Falcon was the first of 3 inbounds into E Midlands and allocated FL60. At the last minute overflying traffic had been re-routed to LICHFIELD/DAVENTRY at FL90. A Birmingham departure had been pre warned to the Sector and there were 'capped' jets at FL180 chasing turboprops also at FL180 – he thought that there were about a dozen ac in 4-5mins through LIC/SAPCO with all the associated extra co-ordination that entailed. He heard the TRENT SC giving avoiding action and rang E Midlands to tell them it had been taken against the Falcon.

UKAB Note (2): The traffic levels were assessed as being moderate during this period and the 'target sector flow' was not exceeded. However, it is reported that the complexity was high.

ATSI reports that the MACC TRENT RADAR SC described his workload as moderate at the time of the Airprox. It had increased because of three inbounds to E Midlands Airport, with a potentially conflicting overflight at FL90. Also level capping was in force, therefore, a number of jet ac that would normally fly at levels outside MACC's area of responsibility under the control of LACC, were restricted to FL180.

The A321 Airbus departed at 0836 from RW09 at East Midlands and turned R outbound on a

DAVENTRY (DTY) 2P SID. In accordance with agreed procedures for 'freeflow' flights, East Midlands telephoned the MACC TRENT Sector to pass the ATD. At 0837:40, the Airbus crew established communication with the TRENT SC and reported passing 3800ft ALT climbing to FL70, whereupon the SC cleared the flight to climb to FL80. The controller said that he chose this level to ensure separation from an overflight, which was routeing from the WNW to LICHFIELD (LIC), then DTY, at FL90. The SC explained that, in his experience, this was an unusual routeing for a southbound ac at FL90. Normally, he would expect such flights to be routed by the STAFA Sector further to the W, overhead Birmingham Airport with its associated airspace (upper level FL85) and thence to HONILEY. The LIC-DTY route would usually be used for traffic at FL70, avoiding Birmingham's airspace. He did not know why the LIC-DTY routeing had been selected, adding that he had overheard the STAFA Sector controllers discussing it. The TRENT CO-ORD had co-ordinated the overflight's transit, but he had not been consulted about the choice of routeing through his sector.

The Falcon 900 crew made their initial call on the TRENT SC's frequency at 0838:00, approaching FL100, on a heading of 325°. The flight was instructed to continue on the heading, whereupon the crew reported "*...and we're maintaining more than 300 knots*", which was acknowledged by the SC who issued further descent to FL80. The radar photograph, timed at 0838:00, shows the Falcon 900 passing FL123, with a ground speed of 434kt, 24.3nm S of the Airbus, which was passing FL40 in the climb. Meanwhile, the overflight was maintaining FL90, 10.5nm WNW of LIC. The controller explained that the Falcon 900 was given descent to FL80, to keep it within CAS (base FL75) and to descend it below the level of the overflight at FL90, but in the process, he had overlooked the presence of the Airbus on a conflicting track, climbing to FL80. He could only surmise that he had not noticed the A321 on his radar display because the SSR label may have been overlapping with another ac at the time. Nevertheless, reference to the fps display would have revealed the confliction to him.

The TRENT CO-ORD and E Midlands APPROACH had agreed a level of FL60 at the EMW for the Falcon, with FL70 and FL80 for the next two inbounds respectively. Accordingly, at

0838:50, the TRENT SC instructed the Falcon crew to descend to FL60. The flight was cleared direct to the EMW whilst the conflict was still unrecognised between the subject ac, the SC then transferred the Falcon to E Midlands APPROACH at 0839:00. The radar photograph, at that time shows the two ac on conflicting tracks, 15.4nm apart - the Falcon 7nm SE of SAPCO, passing FL101 at 364kt and the Airbus passing FL50. [ATSI Note: Standard Arrival Routes, via SAPCO, are shortly to be introduced at E Midlands. A speed limit point at SAPCO is to be promulgated, which flights must cross at 250kt IAS or less.]

The TRENT SC first became aware of the situation when he scanned his radar display at about the time STCA activated. At 0839:50, he immediately transmitted “[Airbus C/S] *avoiding action turn right heading two niner zero*”, which was acknowledged by the crew. He agreed that he should have used the revised ‘avoiding action’ phraseology; although he had practised using it during training sessions, here he reverted to the phraseology with which he was more familiar. The Airbus crew asked if it was to avoid traffic at L - 10 o’clock. When this was confirmed, at a range of 6nm going N, the pilot reported that he had the Falcon on TCAS. Meanwhile, soon after contacting E Midlands APPROACH, the Falcon crew was given an avoiding action turn onto 020° and instructed to stop descent at FL80. Both controllers issued their avoiding action instructions independently, without reference to each other. The radar recording reveals that when the Airbus crew was given avoiding action the ac was climbing through FL61. The Falcon was tracking N, descending through FL84, with the Airbus at 12 o’clock – 8.2nm away. Minimum separation reduced to 3.6nm/400ft at 0840:29, as the avoiding action turns took effect and the ac tracks diverged. Standard horizontal separation of 5nm as required to be applied by the TRENT SC was restored 17sec later.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board was disappointed that the Airbus pilot had not contributed a report, as this element of the investigation was incomplete. Nevertheless, members commended the MACC TRENT SC for his candid input; it was apparent that having cleared the outbound Airbus to climb to FL80, the SC subsequently issued descent clearance to the inbound Falcon (initially to the same level) whilst they were on conflicting tracks. Although the situation was complicated by the presence of the overflight, unusually routeing LIC-DTY, members agreed that this might have pre-occupied the TRENT SC, apparently distracting his attention elsewhere in the Sector, away from the impending Airprox. Whilst the TRENT SC had evidently resolved the potential conflicts between the overflight and the two jets here, he had not taken account of the A321 Airbus climbing to FL80, when he instructed the Falcon 900 crew to descend through this level to FL60 at 0838:50. This situation should have been readily apparent to the SC from a scan of his fps display and controller members agreed that this Airprox illustrated clearly the importance of utilising the fps display as well as radar to check for potentially conflicting traffic. Some members queried if the relatively high speed of the Falcon had caught out the SC and was a factor here. It was unclear why London CONTROL had requested the pilot to fly at >300kt, which might have been because of the two other ac following the Falcon, inbound to E Midlands. However, members noted that the Falcon pilot had clearly stated his speed when he checked in with TRENT, whereupon the SC could have adjusted it then if necessary; controller members concluded that the pilot was complying with ATC instructions in this respect. The Board agreed unanimously that this Airprox had resulted because the TRENT SC did not ensure separation between the A321 Airbus, outbound from East Midlands Airport and the inbound Falcon 900, as he was required to do.

Not realising the situation, the TRENT SC transferred the Falcon – that was still above the Airbus - to the E Midlands APR, who, presented with the conflict, promptly issued appropriate avoiding action to the crew. It was evident that the combination of the APR’s swift assessment of the situation and Falcon pilot’s prompt reaction to this instruction had stopped the situation from deteriorating further. Similarly, when the TRENT SC realised the situation he issued appropriate avoiding action, which was promptly complied

AIRPROX REPORT No 196/02.

with by the Airbus pilot such that neither crew received TCAS RAs. This also ensured that the minima achieved were not less than 3-6nm horizontal separation and 400ft vertically. In the Board's view, these factors ensured that no risk of a collision had existed in the circumstances reported here.

The Board noted the comments expressed regarding the routing of medium level overflying traffic (level capped flights) whereby MACC was now responsible for providing a service to GAT, which might in other circumstances have been operating above their area of responsibility under the control of either LACC or LTCC. With regard to transit flights at lower levels, the NATS Ltd advisor explained that arrangements had been put in place to ensure that the respective ATSU watch managers were able to report any difficulties encountered with the overflight of traffic in the lower levels at the point where the three ATSUs (MACC, Birmingham & East Midlands) interface. This would provide a useful conduit to highlight these issues to management, enabling

this aspect to be reviewed where appropriate. Furthermore, the ATSI advisor briefed the Board that new East Midlands airspace changes and accompanying procedures were currently in draft and the airspace design awaited approval from DAP. It is hoped that the procedures, whereby LTCC would provide an ATC Service to GAT S of E Midlands could be introduced in May 2004. Meanwhile, current procedures have been reviewed in consultation with East Midlands and a TOI is due to be issued before the end of Aug 2003, to trial a new fps marking routine for traffic routing via SAPCO, the MACC/East Midlands interface junction.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The TRENT SC did not ensure separation between the outbound A321 Airbus and the inbound Falcon 900.

Degree of Risk: C.

AIRPROX REPORT NO 197/02

Date/Time: 9 Oct 1302

Position: 5247N 0054E (5nm SE of Sculthorpe - elev 214ft)

Airspace: UKLFS/FIR (Class: G)

Reporting Aircraft Reported Aircraft

Type: B206 JetRanger Tornado GR4

Operator: Civ Comm HQ STC

Alt/FL: 500ft 500ft

(agl) (Rad Alt)

Weather VMC CAVOK VMC CLBC

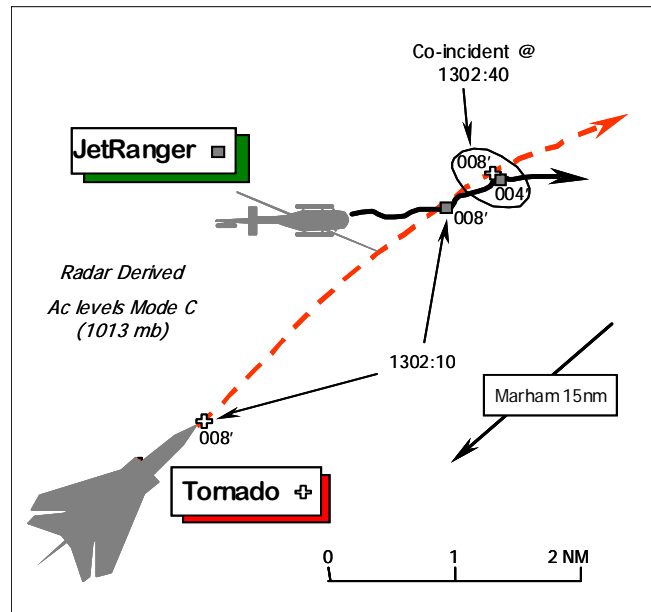
Visibility: 10km+ 10km+

Reported Separation:

nil H, 100-150ft V ½nm H, 450ft V

Recorded Separation:

300yd H, 400ft V

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

THE B206 JETRANGER PILOT reports that he was conducting a pipeline inspection flight at 500ft agl. His helicopter has a silver and black livery; anti collision beacons and the upper HISL were on. The PINS squawk of A0036 was selected with Mode C and he was in VHF contact with Coltishall ZONE on 125.9MHz, under a RIS. Neither TCAS nor any other form of CWS was fitted at the time – but is now. Heading 060°, approaching a position 2½nm S of Fakenham, at 105kt, ZONE alerted him to conflicting traffic. Initially, it was called at 5 o'clock - 8nm he thought [UKAB Note (1): it was actually reported by ZONE at a range of 4nm] - at 1000ft, then soon afterwards at 5 o'clock - 2½nm and at the same height as his helicopter - 500ft agl. Based on ZONE's second traffic information call, he immediately decided to commence a rapid descent into a field ahead, reducing speed to 60kt and arresting the descent at 50ft agl. A fast-jet was then seen after it had passed overhead from 5 o'clock and was flying away at 11 o'clock, 100-150ft above his JetRanger. He was unsure if his helicopter had been seen by the jet's crew, if they had not seen him, he believed the risk of a collision would have been "high".

THE TORNADO GR4 PILOT reports that he had departed from Marham on a low-level sortie in LFA5 at 440kt. His ac has a camouflage colour

scheme but the HISLs were on. The LFS squawk of A7001 was selected with Mode C, but neither TCAS nor any other form of CWS is fitted. He had initially been in contact with Marham APPROACH, and had been aware of a helicopter calling on the APP frequency passing N of Marham. About one minute later, just after changing to a tactical frequency, whilst about 20nm NE of Marham heading 059° at 500ft Rad Alt, the JetRanger was spotted at R 3 o'clock, about ½nm away and about 450ft "well below" his jet. Maintaining good visual contact on the helicopter they continued with their mission; no avoiding action had been necessary and he assessed there was "no" risk of a collision.

MIL ATC OPS reports that the Coltishall RT recording timebase was about 2min 10sec behind the radar recording timebase, thus the timings herein have been correlated to that of the radar recording. The JetRanger pilot free-called Coltishall ZONE at 1259:15, and confirmed his routing and height "...tracking along a pipeline from Wisbech to Bacton at 500 agl..." and requested a RIS. ZONE confirmed that the JetRanger would not be above 500ft, identified the ac using the ident feature and placed the flight under a Limited RIS at the "...base of radar cover and also due to radar suppression operating SSR only". To which the

AIRPROX REPORT No 197/02.

pilot responded "[C/S] roger, understood". At 1302:10, traffic information was passed by ZONE to the JetRanger pilot "...right at 5 o'clock range of 4 miles converging, fast moving indicating 1000ft", whereupon the pilot responded "...looking". At 1302:24, the pilot of another ac called ZONE, but the controller elected to delay answering this flight immediately and instead update the JetRanger pilot on the conflicting traffic, "...previously reported traffic indicating similar level due south". Again at about 1302:30, further traffic information was issued "now right 5 o'clock range of two and a half miles converging from behind". The helicopter pilot acknowledged both calls and ZONE then attended to another flight. At 1303:08, ZONE advised the JetRanger pilot "...previously reported traffic now...clear of your current position to the northeast" to which the pilot replied "...affirm, we're visual". At 1308:12, the JetRanger pilot advised ZONE "Now it's a bit quieter in the cockpit we, we'll be putting in an Airprox...". Thereafter details of the Airprox were transmitted including a comment from the JetRanger pilot, "you reported the ac to us at 8 miles out [it was actually called as 4nm] – 5 o'clock we didn't see it you reported it same level at 5 o'clock in our blind spot, so there was no option but to descend so we descended to 50 feet, the ac came straight over the top of us about 100 to 150 feet above us".

Marham reports that the Tornado departed Marham VFR under a FIS and switched en route at 1300:18, when the JetRanger was not visible on Marham's radar.

Apart from the second call, when the traffic information passed was inaccurate, ZONE had endeavoured to keep the helicopter pilot informed about the conflicting jet. As Coltishall were working SSR only, ZONE more than adequately fulfilled his obligations under the Limited RIS. Marham were unable to see the JetRanger and therefore were unable to provide a warning to the Tornado pilot. Although the Airprox occurred at 15nm NE of Marham in their climbout lane, the JetRanger pilot was probably better off with Coltishall ZONE, where he could at least be seen on SSR and offered appropriate traffic information. Even had he been working Marham (under a FIS in that area) he would not have heard the Tornado depart as it was operating on a UHF frequency, as is the norm.

THE TORNADO PILOT'S UNIT comments that the principles of "see and avoid" worked yet again. The Tornado crew was visual with the helicopter up to and beyond the point of minimum separation, and at no time considered that there was any risk of collision.

UKAB Note (3): Analysis of the Cromer Radar recording shows that the Airprox occurred at about 5nm SE of Sculthorpe. The JetRanger is shown tracking steadily eastwards maintaining 800ft unverified Mode C (1013mb) as the GR4 approaches from the SW also indicating 800ft unverified Mode C (1013mb). The avoiding action descent reported by the JetRanger pilot is shown at about 1302:30, as the helicopter descends through 600ft and then levels at 400ft Mode C (1013mb). The respective contacts merged at 1302:40, with 400ft vertical separation indicated as the GR4 passed obliquely astern of and about 300yd to port of the helicopter. Meteorological Office archive data gives an actual QNH for the Airprox location of 1008mb, therefore, 400ft Mode C (1013mb) would equate to about 250ft amsl; a contour line gives a ground elevation of about 200ft amsl in the vicinity.

HQ STC comments that the Jetranger pilot took sensible action on the traffic information he was receiving from ATC, and descended to a height that avoided any possibility of confliction. Although the descent to 50ft made it difficult for the Tornado to see the Jetranger, the GR4 crew did acquire it visually, and confirmed that they would pass well clear.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board noted that the JetRanger pilot had wisely obtained a RIS to supplement his lookout whilst executing his pipeline inspection task. This had a significant influence on the outcome of this occurrence and members commended the Coltishall ZONE controller for his assiduous application of the service. The good flow of traffic information provided by ZONE, warned the

helicopter pilot about the jet, which he would have been unable to see approaching rapidly from astern; this information enabled the JetRanger pilot to build a good air-picture of the developing conflict. This Airprox was a good example to controllers and pilots alike of the benefits that can accrue under a radar service - even when the service is limited because of the extremities of radar cover at low-level – but pilots should be aware that the service provided here had been above the norm. The helicopter member explained why the Jetranger pilot had not turned his ac to see the jet. There had been little time to do much and the Board commended the JetRanger pilot's sensible decision to resolve matters by descending down to 50ft agl, which was a wise move.

Under the 'Rules of the Air' the helicopter pilot had 'right of way' in this overtaking situation, which only works if the overtaking pilot can see the other ac beforehand. The members considered the Tornado crew probably had the opportunity to see the helicopter in this overtaking situation, but the small ac at a tail-on aspect with little relative movement to draw attention to it would have been difficult to spot. The radar recording showed that the JetRanger was at the same height as the jet

until about 30 sec before the GR4 passed at the CPA. Although the Tornado GR4's radar does have a very limited Air-to-Air capability it would not have been of any practical use here – further evidence of the urgent need for a CWS/TCAS in this environment. Thus the Tornado crew was entirely reliant on their own lookout to spot the small helicopter and avoid it but neither the pilot nor his navigator, detected it until they were already passing it. They saw it on the starboard beam – about 300 yards away according to the radar recording (neither directly overhead nor ½nm away as reported) - and some 400ft below the jet - after the JetRanger pilot had descended down to 50ft agl. Thus in the Board's view this conflict had been resolved by the sensible actions of the helicopter pilot who had entirely 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 B206 pilot.

Degree of Risk: C.

AIRPROX REPORT No 198/02.

AIRPROX REPORT NO 198/02

Date/Time: 9 Oct 1313

Position: 5238N 00350W (2.75nm N of Machynlleth)

Airspace: London FIR/ (Class: G)
UKDLFS LFA 7

Reporting Aircraft Reported Aircraft

Type: AS355 Harrier GR7

Operator: Civ Comm HQ STC

Alt/FL: 300ft↑ 300ft

(agl) (Rad Alt)

Weather VMC CLBC VMC

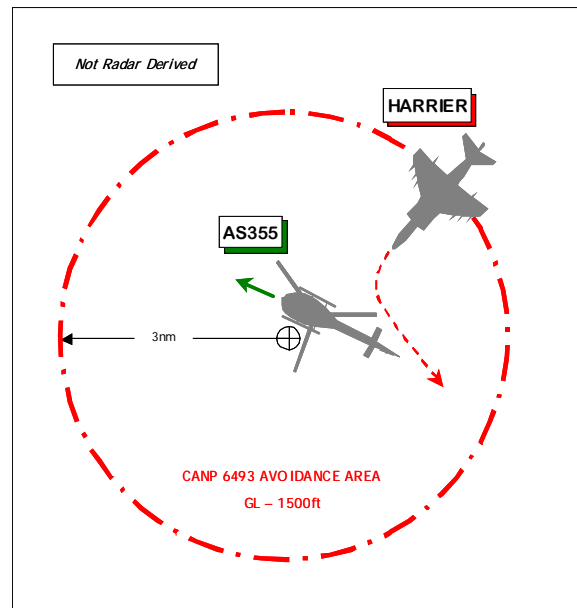
Visibility: >10km Not Reported

Reported Separation:

200m H, Nil V Not Seen

Recorded Separation:

NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE AS355 (TWIN SQUIRREL) PILOT reports that his ac was red and equipped with HISLs. He was conducting an USL task in an area of 2nm radius for which he had submitted a CANP. He was operating in good VMC, about 2000ft below cloud, but was not in receipt of an ATS. Having just lifted with an USL, he was climbing through 300ft agl and hdg 290° at 50kt when a Harrier was seen approaching from his 4 o'clock at about 500m range. The Harrier, which was in a hard L turn, passed about 200m behind and at the same altitude. He assessed that risk of collision had been high since the heavy load he was carrying severely restricted his ac's manoeuvrability and, as a result of which, took no avoiding action. He had submitted the CANP in order to prevent such incidents from occurring.

THE HARRIER GR7 PILOT reports that he was leading a pair of Harriers conducting a low level sortie in LFA 7 with another Harrier pair acting as bounce; at the time of the reported incident the other pair were >4nm away and 5000ft agl. He did not see the reporting ac. At the time he thought that he would have been hdg approximately S, at 300ft (Rad Alt) and at 420 kt. His No 2 was in Battle Formation, approximately 1.5nm to his R. He was not in receipt of an ATS. His ac was

camouflaged light grey, HISLs were selected on but neither TCAS nor any other form of CWS was fitted.

UKAB Note (1): CANP 6493 was published on 8 Oct and promulgated an avoidance placed at N52 37.4 W003 50.6 (SH 752045) GL-1500ft, 3nm radius circle, active 090930 to 091500.

UKAB Note (2): The Harrier Formation had departed from Benson and, prior to flight, the pilots had briefed using facilities provided by a host sqn at that base. Although the relevant NOTAM had been received and filed by sqn ops staff, the relevant numbered pin placed in the display chart had fallen out and consequently the subject Harrier pilot was unaware of the relevant NOTAM.

HQ STC comments that it is disappointing that the support system let the Harrier pilot down. Although the pilot checked for NOTAMs and CANPs, a simple failure prevented him receiving the required information. This Airprox will be highlighted to DASC for publication, so as to emphasise the role that everyone plays in flight safety, and to highlight how one small error could ultimately lead to a near disaster.

UKAB Note (3): The incident occurred below radar coverage. However, the subject Harrier can be seen on Clee Hill recorded radar data prior to and after the encounter, together with the other 3 ac participating in the same sortie; this enabled its identification. Returns from the lower Harrier pair are lost at 1312:51 approximately 4nm N of the incident location and reappear approximately 8nm ESE of the location at 1314:47. This would suggest that the incident occurred at about 1313.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac, details of the relevant CANP, radar video recording and comment from the Harrier operating authority.

It was clear that the pre-flight briefing facilities used by the Harrier pilot had been inadequate and had left him unaware of the relevant NOTAM; as a consequence, he had unwittingly penetrated the active avoidance area. The Board was advised that since this incident the NOTAM display system at the host sqn has been improved to prevent recurrence. Members were concerned that the FJ pilot had not seen the helicopter and were agreed that it was a good sighting by the AS355 pilot of

the Harrier, already in a hard L turn, not only because it was in his 4 o'clock but also because he had just lifted with a heavy USL. That the Harrier pilot had not seen the AS355 may have been due to the latter climbing from below and, once in the turn, he was belly-up to it. But they noted that whilst the turn took the Harrier clear of the AS355, this turn was fortuitous rather than planned avoiding action. Therefore, coupled with the MSD estimated by the AS355 pilot, whom the Board had no reason to doubt, and the non-maneuvrability of the AS355, the majority of members were persuaded that a risk of collision had existed.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause:

- a. Inadequate flight planning (CANP display system) at the host sqn, which led to:
- b. The Harrier pilot inadvertently penetrating the notified CANP avoidance area and flying into conflict with the AS355 (with an USL), which he did not see.

Degree of Risk: A

AIRPROX REPORT No 199/02.

AIRPROX REPORT NO 199/02

Date/Time: 9 Oct 1516

Position: 5107N 00024E (4nm NW of TIGER)

Airspace: London TMA (Class: A)

Reporting Aircraft Reported Aircraft

Type: A319 B737

Operator: CAT CAT

Alt/FL: FL136 FL130

Weather VMC VMC CAVOK

Visibility: NK NK

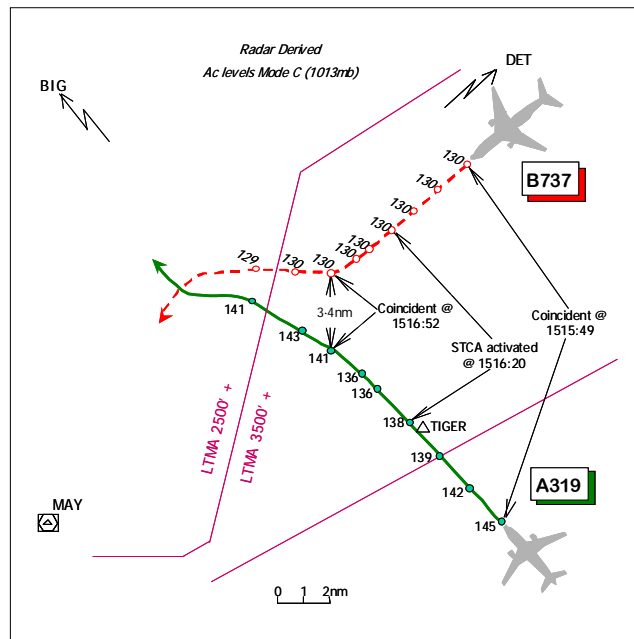
Reported Separation:

3nm H, 500ft V 0.5nm H, 600ft V

Recorded Separation:

Min V 600ft @ 4.9nm H,

Min H 3.4nm @ 1100ft V



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE A319 PILOT reports that he was inbound to Heathrow from Geneva and in contact with LTCC. Whilst in descent from FL140 to FL130 at 220kt and passing FL136, ATC issued avoiding action to turn L onto a heading of 270° and climb to FL140. The co-pilot disengaged the autopilot, applied Take-off/Go Around power (TOGA) and, with the traffic visual on the R, flew the avoiding action. A TCAS TA enunciated and minimum separation was estimated to have been 500ft V and 3nm H. He assessed that the risk of collision had been "medium".

THE B737 PILOT was inbound to Gatwick from Amsterdam and in contact with LTCC on 120.17MHz and reports that he was on course to the MAYFIELD VOR (MAY) at 250kt, tracking 260°(M), at FL130. TCAS enunciated with a TA just as ATC instructed an avoiding action turn R heading 315°. The traffic on TCAS was to the L, above but descending. As they turned R an Airbus, possibly an A320, was seen visually and on TCAS; it was climbing. ATC advised that the traffic was now climbing and that they could continue to MAY. The other ac was not on the same frequency. Minimum separation was estimated to have been 600ft vertically and 0.5nm

horizontally and he assessed the risk of a collision as "medium".

THE LTCC BIGGIN SECTOR CONTROLLER (BIGGIN SC) reports that she was working the A319 inbound to BIG on frequency 120.525MHz, whilst the TIMBA SC was working the B737 inbound to Gatwick and routing to MAY at FL130. She descended the A319 to FL110 forgetting about the B737. As the A319 was passing FL139, conflict alert triggered. She gave an avoiding action turn and climb to the A319, which stopped descent at FL136. Neither the A319 nor the B737 crew received TCAS. Both crews reported visual with the other ac.

THE LTCC TIMBA SECTOR CONTROLLER (TIMBA SC) reports that he was working the B737 on 120.175MHz when STCA started against the A319. He observed the latter descend through FL140 into confliction with his B737 and gave avoiding action together with traffic information. The B737 pilot reported visual and separation was maintained.

ATSI reports that LTCC TMA South East Sectors were split at the time of the incident into BIGGIN and TIMBA. The BIGGIN SC described her

workload as moderate. She had only taken over the position about 3min prior to the Airprox.

The crew of the A319 established communication with the BIGGIN Sector at 1514, reporting heading 315° and descending to FL150, iaw the Standing Agreement between LACC Sector 17 and TC BIGGIN. The ac was instructed to route direct to BIGGIN (BIG) VOR to expect to hold for less than 10min. A short time later, the BIGGIN SC cleared the A319 to descend to FL140. She commented that this descent took into account the presence of the B737 at FL130, which was routeing through DETLING (DET) VOR, inbound to Gatwick, under the control of the TIMBA Sector. She added that the fps for both ac were in position in her display.

Having issued descent clearance to the A319, the SC turned her attention to other sector traffic, including a Gatwick to the Isle of Man flight, which she instructed to climb to FL100. Shortly afterwards, the A319, passing FL145, was cleared to descend to FL110. The SC explained that this descent took into account the Gatwick outbound but not the B737, which radar, at 1515:52, shows was 11.4nm N of the A319, on a crossing track, maintaining FL130. She said that she had previously discounted the B737 as conflicting traffic to the A319. This was based on her expectation that the B737 would follow the TIMBA 2E STAR ie track the DET 196° Radial to LARCK, although there was no guarantee that this would have ensured separation. However, unknown to her, although the radar display would have shown that the flight had not turned onto the DET Radial, at 1511:40 the ac had been routed direct to MAY VOR. This routeing, she accepted, was not an unusual occurrence. She later realised that the TIMBA SC had annotated the B737 fps displayed on her sector to show it routeing to MAY; she could not determine whether this annotation was made whilst she was in position or before she had taken over the sector.

STCA activated at 1516:20, when the subject ac were on conflicting tracks, 7nm apart. The B737 was maintaining FL130, with the A319 descending through FL138. The BIGGIN SC said that this was the first time she had become aware of the potential confliction. She immediately issued the A319 with an 'avoiding action' L turn heading 280°, followed by an instruction to climb to FL140. Although the correct term was used,

the more recent avoiding action phraseology was not employed. The SC commented that she was aware of the new phraseology but had reverted to the one she was more used to in the 'heat of the moment'. Traffic information was passed to the pilot, who reported sighting the traffic. The A319 reached FL135 at 1516:40, when the distance between the 2 ac had reduced to 4.9nm. Thereafter, the ac commenced climbing, and vertical separation was re-established before the standard horizontal separation of 3nm had been compromised. The A319 had reached FL140 when the subject ac were 3.4nm apart.

At the same time as the BIGGIN SC was issuing avoiding action to the A319, the TIMBA SC independently instructed the B737 crew at 1516:30, to turn R for avoiding action (using the old phraseology) onto a heading of 315°, which was 'read-back'. Traffic information was passed and the pilot reported visual with the other ac. Both pilots later reported having received TCAS TAs.

UKAB Note (1): Analysis of the Pease Pottage recorded radar data reveals, at 1515:49, the A319, squawking 5741 with Mode C on a steady track inbound BIG with the B737, squawking 7345 with Mode C, 11.4nm to the N, on a converging track inbound MAY and level at FL130. At 1516:20, when STCA activated, the A319, displaying 138 on Mode C is 7nm S of the B737. Minimum level reached by the A319 is shown on the radar sweeps timed at 1516:33 and 1516:39. Thereafter, vertical separation is shown to increase and the prescribed vertical minimum is shown restored on the sweep timed at 1516:52 when the ac are 3.4nm apart.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board noted that this encounter had occurred barely 3 minutes after the BIGGIN SC had taken over responsibility for the position. From her laudably frank and honest account, it was evident that the BIGGIN SC had inexplicably 'forgotten' about the B737 tracking toward the MAY VOR at

AIRPROX REPORT No 199/02.

FL130, even though the B737's fps had been annotated with that routeing by her colleague the TIMBA SC. Thus, for whatever reason, the SC had overlooked the presence of the B737 when she cleared the A319 crew to descend to FL110, through the B737's level and thereby into conflict with the latter. However, several safety nets remained and had yet to be breached before this situation could have deteriorated further. STCA alerted both controllers who identified the conflict on radar and reacted promptly by issuing appropriate avoiding action instructions to both crews. This made each crew aware of the presence and proximity of each other's ac and also presaged TCAS TAs. The combined effect of these warnings was that both crews also visually acquired each other's ac at an early stage and significantly, the crews' prompt reaction to avoiding action instructions prevented the ac from getting too close. In the end this ensured that the standard separation minima required in the terminal environment – 3nm horizontal or 1000ft vertical separation - was maintained throughout and, significantly, in excess of that reported by both pilots. As standard separation had not been

eroded the Board concluded that this was a sighting report. Moreover, all the safety nets had played their individual part and the Board agreed unanimously that no risk of a collision had existed in the circumstances conscientiously reported here.

Nevertheless, there were undoubtedly some important human factors issues within this incident which warranted further study. The Board was, therefore, encouraged to learn that research is being conducted by the ATS provider into the topic of controller's 'memory lapses' and specifically why controllers, on rare occasions such as reported here, have descended ac through the levels of another without recognising the conflict beforehand.

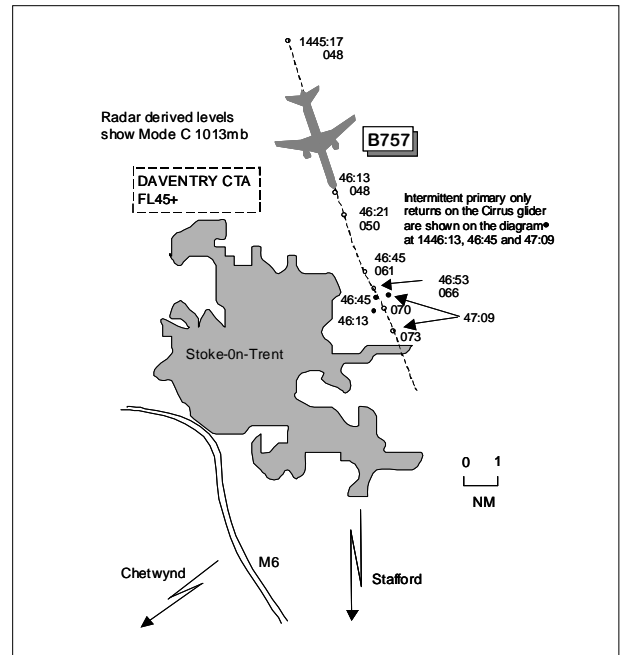
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Sighting report.

Degree of Risk: C.

AIRPROX REPORT NO 200/02

Date/Time: 6 Oct 1447 (Sunday)
Position: 5304N 0206W (3nm ENE of Stoke-On-Trent)
Airspace: DTY CTA (Class: A)
Reporting Aircraft Reported Aircraft
Type: B757 Cirrus Glider
Operator: CAT Civ Club
Alt/FL: FL65↑ NK (QFE)
Weather VMC CLAC VMC CLOC
Visibility: 50km 25nm
Reported Separation:
 nil V 150m H not seen
Recorded Separation:
 <0.2nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE B757 PILOT reports departing Manchester flying a LISTO 1S SID and climbing to maintain 5000ft QNH 1022mb with no ATC speed restriction and receiving an ATS from MACC on 134.42MHz. Having levelled-off, he accelerated to 290kt in IMC flying the ac manually with auto-thrust selected. ATC gave clearance to climb to FL190 at LISTO which he commenced. About 10nm after LISTO, whilst heading 170°, he broke through the cloud tops at FL65 to be confronted with a high performance glider in his 1230 position, 300-500ft ahead at his level; it appeared to be in a steep RH wing-over turning back towards him. He took immediate avoiding action by initiating a steep LH climbing turn, passing the glider by 150m; no warning had been given by ATC and during the manoeuvre some of the crew were thrown about but suffered no injuries. After the Airprox, ATC saw the traffic on primary radar and tracked it. He assessed the risk of collision as high.

THE CIRRUS PILOT reports that he had been flying on an aerotow for about 30-40 min from Long Mynd with the intention of landing away at Camphill. The cloud base was 3000ft and the ac tug had climbed the combination in VMC above

the cloud layer, tops of 5000-5500ft, between Shrewsbury and Telford; the visibility was about 25nm above cloud. Whilst tracking NE, the cloud became thicker with fewer gaps to see the ground and he had placed complete faith in the tug pilot to keep them clear of CAS. He became uneasy, owing to the amount of cloud obscuring the ground, and he had great difficulty identifying ground features until, upon catching a glimpse of a Motorway, he quickly realised that he was further E than he thought he was, probably close to Stoke-on-Trent and flying within CAS where the base was FL45. By now he was at 7000ft QFE (Long Mynd elev 1411ft), so he quickly released from the tug and commenced a descent at 80kt with the airbrakes out to increase the ROD, on a generally E to NE track, avoiding cloud and looking for a suitable area to get below the cloud base as quickly as possible. He did not see any conflicting traffic whilst in the Stoke-on-Trent area and eventually carried out a successful field landing N of Uttoxeter, near Alton Towers.

THE TUG AC PILOT furnished a report when requested by the UKAB through the Gliding Club CFI but it was not completed until a couple of weeks post incident. He was not sure of the exact

AIRPROX REPORT No 200/02.

details as he could not recall any memorable events occurring at the time. The gliding club had been busy on the day with gliders queuing at the aerotow launch point and he thought that this aerotow had been just another launch, only higher and longer than usual. It was an unexpectedly excellent October gliding day, post cold front conditions with good convection to a cloud base of about 4000ft amsl and tops 5000ft. Wind was northeasterly, a few knots at ground level but stronger at altitude, with average visibility below cloud but excellent above. Cloud cover at Long Mynd was 2 oktas but to the NE it increased and became more spread out, banding across the wind presumably owing to wave effect off the Derbyshire hills. The subject Cirrus glider pilot had requested a high tow to the NE for a flight to Camphill. He commenced the aerotow and expected the glider to pull-off at 4000ft QFE as most others had done but on this occasion he continued to the NE until SW of Telford, reaching 7000ft QFE (8500ft amsl). He then expected the glider to pull-off and glide out to the NE but he was requested to continue the tow; he levelled off and reduced power. The glider pilot requested descent owing to CAS ahead which he commenced and then, when he considered that he had approached close enough to CAS ahead, he commenced a slow turn which was taken as a hint for the glider to release. He thought that they had descended a thousand feet from the highest point of the aerotow, which would give a release height of about 7500ft amsl and that the release point was S and W of Stafford, clear of CAS. He returned to Long Mynd to continue with more aerotows and did not see any other ac above cloud.

UKAB Note (1): The MACC RT transcript shortly after 1446:50 reveals the B757 pilot transmitting *"We've just had to take avoiding action on a glider it's about six and a half thousand feet"*. The controller replies *"B757 c/s that's understood there's nothing showing on radar"*. The pilot responds *"Okay it's a glider so I doubt he has a transponder"*. Approx 30 sec later, the SC asked the B757 pilot if he needed to file a CA1261 report on the incident. The B757 pilot replied *"Yes sir we're gonna have to that was er just a few hundred feet away from us"*. When further asked for more precise details, the airliner pilot transmitted *"Er he was in our right one o'clock about three hundred feet above er in a vertical manoeuvre possibly a chantal er left wing down*

we had to make a fairly sharp left hand turn to avoid him". ATC acknowledges the call and adds *"...we've now got an intermittent primary showing on radar"*. A minute and a half later the B757 pilot calls the SC saying *"...he was about er he was actually descending through our level about three hundred feet away in a nose down vertical manoeuvre"*. The controller replies *"B757 c/s that's understood er we've still got him painting on the radar we'll see if we can er follow him to destination but I'm sure he'll dip out underneath eventually"*.

ATSI reports that there are no apparent ATC causal factors. The B757, having been cleared by the MACC-STAFSA Sector to climb to FL190, reported an Airprox with a glider at about six and a half thousand feet. At the time, the B757 was within the Daventry CTA (Class A). It is possible that a primary radar return may have been visible on the radar display but there was nothing to indicate that the ac could have been in CAS. MATS Part 1, Section 1, Chapter 5, Page 13 'Action to be taken by controllers with reference to unknown ac' applies.

UKAB Note (2): Analysis of the Clee Hill recorded radar at 1445:17 shows the B757 9.5nm N of Stoke-on-Trent tracking 165° from the Manchester area level at FL048 (5070ft QNH 1022mb). Less than one min later (1446:13) as the B757 is about to commence its climb, a pop-up primary return appears, believed to be the Cirrus glider, in its 12 o'clock range 3.95nm. The next radar sweep shows the B757 climbing through FL050 ROC 2500fpm still tracking 165°. The glider pops up once more at 1446:45, 0.85nm ahead of the B757 which is climbing through FL061. The next radar sweep shows the B757 indicating FL066 (which is when the Airprox is believed to occur) and then 8 sec later (1447:01) now tracking approx 155° climbing through FL070 having passed close to the glider's radar trail history. Although the glider is not seen again until 1447:09 1.15nm N of the B757 which is indicating FL073, it is estimated, taking into account the glider's speed and max possible deviation from a direct track between its two visible radar sweeps, that the subject ac passed within 0.2nm of each other horizontally (360m).

Prior to the Airprox at 1431 the recorded radar shows a slow moving primary only return, believed to be the tug/glider combination,

adjacent to Chetwynd airfield tracking ENE. This return fades shortly thereafter but reappears at 1434:53 8nm SSW of Stoke-on-Trent tracking NE before fading again 3 min later 5nm SSW of Stoke. About one min later, a primary only return is seen, believed to be the tug ac, SW bound with a another pop-up primary only return, believed to be the Cirrus glider, showing shortly afterwards just to the 4nm SSW of Stoke tracking NE. The glider primary can be seen only intermittently tracking NE before fading, 5min later, just SE of Stoke-on-Trent at 1443:09.

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 wondered why the Glider pilot had asked for an aerotow to such a high level (7000ft QFE approx 8400ft QNH) knowing that there was CAS ahead extending down to FL45 on his intended track; there appeared to be no rationale to his plan. Ultimately, the tug pilot had been responsible for the navigation of the combination during the aerotow but members were critical of his displayed airmanship when he endeavoured to navigate above cloud for such an extended period. That aside, members also believed that

the Cirrus pilot always had the option of 'pulling off' the tow when he became uneasy about his geographical position. Members could not reconcile the differences reported from both pilots on where the two had parted company. All that could be extracted reliably from the information available, was that the Cirrus pilot had then flown into conflict with the B757, which he did not see, having entered CAS without clearance.

Turning to risk, the B757 pilot saw the glider as he 'broke out' of cloud in his 1230 position, 300-500ft away at the same level; it was seen to be in a steep RH turn (wing over) towards him. He had initiated an abrupt LH climbing turn to avoid the glider and watched it pass 150m clear. Surprisingly, the Cirrus pilot had not seen the B757. The actions of the B757 pilot combined with the geometry of the encounter had been enough to ensure that the subject ac were not going to collide. However, the Board were clear that during the conflict, the safety of both ac had not been assured.

PART C: ASSESSMENT OF CAUSE AND RISK

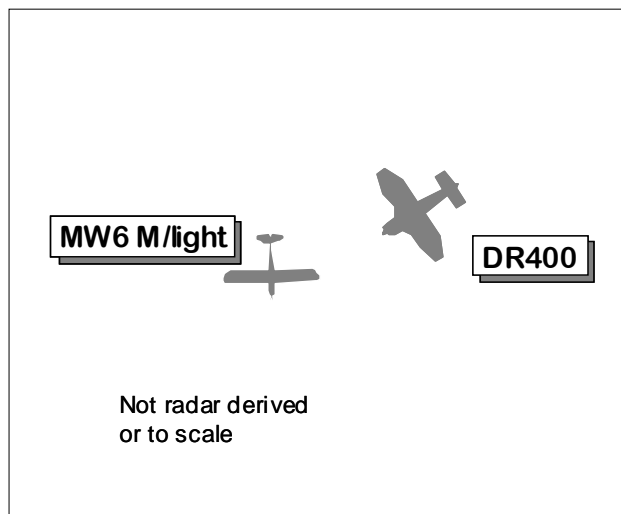
Cause: Unauthorised penetration of Class A airspace by the Cirrus pilot, who flew into conflict with the B757, which he did not see.

Degree of Risk: B

AIRPROX REPORT No 201/02.

AIRPROX REPORT NO 201/02

Date/Time: 5 Oct 1407 (Saturday)
Position: 5134N 0223W (2nm NE of Yate)
Airspace: FIR (Class: G)
Reporting Aircraft Reported Aircraft
Type: MW6 M/Light DR400
Operator: Civ Pte Civ Pte
Alt/FL: 1950ft ↓ 2500ft
(QNH 1026mb) (QNH)
Weather VMC CLBC VMC CLNC
Visibility: 40nm >10km
Reported Separation:
30ft V 150ft H 200-300ft H
Recorded Separation:
not recorded



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE MW6 TANDEM M/LIGHT PILOT reports heading 180° at 50kt inbound to a private strip 2nm NE of Yate and he was not in receipt of an ATS. The visibility was 40nm 500ft below an overcast cloudbase in VMC, the ac was coloured cream/red and carried no lighting. He was flying with another PPL holder who was Capt for this leg and seated in the front. Approaching the private strip, joining checks were completed including a search for other ac in the circuit and ensuring that livestock were clear of the landing area. The Capt declared that all was clear and commenced descent with a low throttle setting for a landing in a westerly direction. Immediately after the throttle was closed and as the ac was descending through 1950ft QNH 1026mb, he looked behind and, to his horror, saw a Robin/Jodel type ac in his 7 o'clock range 50yd, slightly below him and closing. He quickly judged that a collision was imminent owing to the other ac's faster speed. With no time to alert the Capt (apart from a shouted expletive), he grabbed the rear sidestick control and pulled up elevator and full R aileron quickly followed by full power. By the time his ac had reached 50-60° bank angle, the other ac, which was coloured white/green, was seen to pass down his LHS range 50yd and about 30ft below, at which time it was sighted by the Capt. The other ac made no attempt to avoid his ac and was seen to continue on a steady track of 220°. He believed that a

collision had been certain owing to his descent profile.

THE DR400 PILOT reports heading 250° at 115kt and at 2500ft QNH inbound to Filton and in receipt of a FIS from Filton on 122.72MHz squawking 7000 with Mode C. The visibility was >10km in VMC, the ac was coloured white/green and his HISL was switched on. Another PPL holder was seated on the RHS operating the radio. Both pilots saw a tandem microlight in their 1 o'clock about 5nm away on a slowly converging/crossing track, he thought initially 600ft above. He discussed the situation with his colleague and decided that it was best to maintain his heading and altitude whilst continuing to keep the other ac in sight; at that time there had been no confliction. However, when he had almost caught the microlight up, which was by now in his 12 o'clock 200-300ft above, it was seen to commence a descent but he still believed that it would pass safely clear to his L by at least 100m. It then appeared that the microlight pilot saw his ac, as it took avoiding action, by pulling up to the L. It appeared the microlight carried out some sort of spiral movement eventually ending up to their R, behind and below, but at a distance never <100m. At no time did he or his colleague consider that there was any risk of collision, in fact he believed that the other ac's avoiding action had made the situation look worse than it really was.

ATSI comments that as the DR400 was under a FIS from Filton ATC, there appears to be no ATC causal factors.

UKAB Note: The Airprox is not seen on recorded radar. The Cleve Hill recorded radar clearly shows the DR400 transiting SW bound through the Yate area squawking 7000 indicating FL017 (2100ft QNH 1026mb). 3 intermittent primary only returns are seen to the NE of Yate, one which may possibly be the MW6 Microlight which does converge on the DR400's track. However, the radar contact fades when within 0.25nm of the DR400.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members were clear that this encounter in Class G airspace came under the 'see and avoid' banner with the DR400 and Microlight on converging tracks. The Robin pilot reported seeing the Microlight 5nm away, in his 1 o'clock and had continued on a steady track whilst monitoring its progress. Under the Rules of the Air Regulations 1996 Rule 17(2)(b)(i), the DR400 pilot was required to give way to the MW6 Microlight to his R. However, after catching up the Microlight, it was then seen to commence a descent when crossing immediately ahead of his track. The Microlight rear seat passenger had then spotted the Robin just behind and below his ac closing, approaching from his blind area and, unknown to him, its pilot was aiming to pass close behind his ac whilst maintaining visual contact. In his belief that the DR400 pilot had not seen his

Microlight, he had reacted instinctively by pulling back and applying full R aileron deflection on the controls followed by full power. This abrupt handling had made the MW6 change flight path quickly in pitch and roll. Indeed, comment was made on the late application of power after the 'pro-spin' control inputs. For safety all three changes should be made together to minimise the risk of 'flicking'. Pilot members expressed some surprise that the MW6 crew had seen the Robin approaching from their rear blind quarter, as in most similar scenarios the ac passing behind would have done so unnoticed. Although members believed that there had been a large 'shock' factor within the MW6 cockpit, it was clear that the DR400 pilot had not given way sufficiently and had flown close enough to cause alarm to the MW6 crew.

Although this had been an unnerving experience for the Microlight crew, the DR400 pilot had 'chosen' the passing distance, which had been eroded when the MW6 had commenced descent. However, members felt that the Robin pilot was always in a position to manoeuvre his ac clear to avoid a collision as he had been well positioned to monitor the Microlight's flight path visually. To that end, the Board were persuaded that although the subject ac had passed closer than the DR400 pilot intended, there had been no risk of collision.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The DR400 pilot did not give way to the MW6 Microlight as required by Rules of the Air Regulations Rule 17(2)(b)(i) and flew close enough to cause alarm.

Degree of Risk: C

AIRPROX REPORT No 202/02.

AIRPROX REPORT NO 202/02

Date/Time: 13 Oct 0900 (Sunday)

Position: 5128N 0110W (3nm SE CPT)

Airspace: London FIR (Class: G)

Reporter: Farnborough ATC

First Aircraft Second Aircraft

Type: C303 Beech 200

Operator: Private Civ Comm

Alt/FL: 4000ft 4000ft
(1010mb) (QNH 1010mb)

Weather NR CLBC VMC CLBL

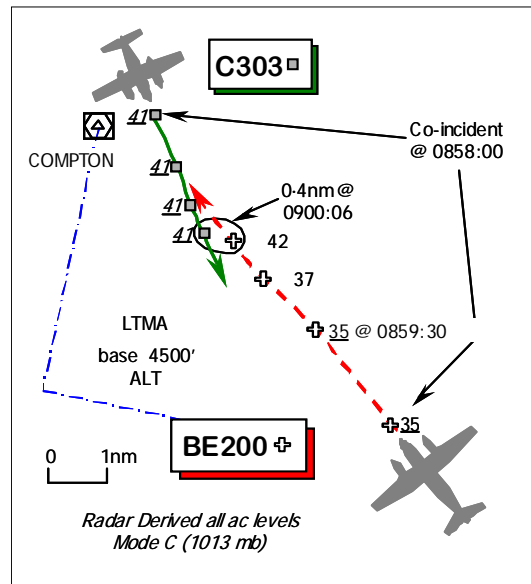
Visibility: 8Km 3Km

Reported Separation:

5-600ft H, 2-300f V 1000m H, nil V

Recorded Separation:

100ft V @ 0.4nmH



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE FARNBOROUGH APPROACH RADAR CONTROLLER (APR) an OJTI, reports that he was monitoring his trainee working the banded Farnborough LARS/APR position. At about 0859, the C303 pilot free-called as the ac passed the COMPTON VOR (CPT) outbound from Oxford/Kidlington to France. The flight was assigned a squawk of A0435, identified and placed under a FIS 1½nm SE of CPT at 4000ft QNH (1010mb). Traffic information was passed about a BE200, 4nm ahead of the C303, flying in the opposite direction indicating 3400ft Mode C. The BE200 was joining airways at CPT and had been transferred to LTCC by his trainee about 8nm earlier. The BE200's Mode C then indicated that it was climbing, which was passed to the C303 pilot who requested a vector; this was not given as the ac was flying VFR under a FIS and the proximity of the BE200 [less than ½nm ahead at the time according to the RT transcript] precluded avoidance. The C303 pilot became visual with the BE200, that climbed through the level of the C303 and passed close down the port side. As the radar returns merged, both acs' Mode C indicated 4000ft.

THE C303 PILOT reports his ac is white with blue stripes and the HISL was on whilst in transit to Paris VFR at 135kt. He was flying in a level cruise

at 4000ft (1010mb), some 500-1000ft below cloud – in between layers - under a FIS from Farnborough. The assigned squawk was selected with Mode C; TCAS is not fitted. He was warned of conflicting traffic by Farnborough ATC (he could not remember the range given) but sighted the other ac - a Beech 200 - about 4-500yd away and assessed it would pass clear down the port side and slightly below his altitude. No avoiding action was necessary – but he was prepared to turn R and climb if it was appropriate – as the BE200 passed 5-600 ft away to port and 2-300ft below his ac whilst climbing. He assessed the risk as “low”.

THE BEECH 200 PILOT reports his ac is white with blue stripes and the HISL was on whilst heading NNW at 250kt to join CAS at CPT, under a FIS from London CONTROL. The assigned squawk was selected with Mode C, but TCAS is not fitted. He had departed Blackbushe on an IFR FPL to join CAS at CPT, Farnborough RADAR was his first contact frequency, who provided a RIS in the open FIR that was terminated when he switched to London CONTROL. Because of RT congestion on the London TC frequency it took him a minute or two to establish contact with London, who asked him to squawk 'IDENT', maintain altitude 3400ft and continue towards

CPT VOR. Shortly afterwards he was cleared to join CAS climbing to FL90 on a direct track for CPT. It was during the climb through about 4000ft QNH (1010mb), about 3½nm SE of CPT, that he sighted a low-wing twin at 10 o'clock passing close down the port side about 1000m away at the same altitude. The tracks were not converging so no avoiding action was taken and he assessed the risk as "moderate".

THE OCKHAM SECTOR CONTROLLER (OCK SC) reports that the outbound BE200 called on frequency remaining clear of CAS. No service was given to the BE200 crew and therefore no CAS joining clearance was issued. The flight was operating under VFR providing own separation. The SSR filters were selected so that low level traffic - A7000, 04XX would not show. Farnborough rang and informed him the BE200 was in conflict with other traffic underneath CAS.

ATSI reports that the BE200 was outbound from Blackbushe to join airways at CPT for a flight to Inverness. The crew called Farnborough, the flight was identified and placed under a RIS. However, the pilot neither volunteered nor was asked for any level information and so the Mode C remained unverified. Shortly afterwards Farnborough terminated the RIS and told the crew to continue with their own navigation for CPT and freecall London CONTROL for a CAS joining clearance. On contacting the OCKHAM SC at 0857:20, the crew was instructed to squawk 'IDENT'. The SC did not inform the crew that they were identified, nor did he verify the Mode C. No level of ATS was specified, although the SC reported, "*No service was given to the BE200 and therefore no joining clearance was given. The aircraft was operating under VFR flight rules providing own separation.*" At 0859:25, the BE200 crew was issued a clearance to climb to FL90 into CAS, but neither a CAS joining clearance, route, nor a change to a RCS was specified. As the BE200 started to climb it came into conflict with a C303 routeing from Oxford – Paris, which had called Farnborough just after 0859:00 for a FIS as it approached CPT flying below the LTMA in the FIR. Subsequent investigation revealed that, due to the selection of SSR filters at the LTCC OCK SC's position, the SSR label of the C303 would not have been

visible to the controller whilst it was on an A7000 or Farnborough allocated squawk. Horizontal separation was 0.4nm as the BE200 passed 'port-port' and 100ft vertically above the C303.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Evidently the Farnborough APR had been concerned by the proximity of the BE200 as it climbed through the altitude of the C303 under his control, such that he had initiated this Airprox report. The APR had ensured that the C303 had been provided with traffic information about the other ac by his trainee, although the C303 pilot had only requested a FIS. This was a wise move, which had enabled the C303 pilot to sight the BE200. Thus forewarned, its pilot would have been able to take avoiding action if it had subsequently proved necessary – which from the C303 pilot's perspective it was not. Though civilian controller members noted that the ATSI report had highlighted some irregularities in the provision of service to the BE200 by LTCC, it also showed that the C303 - squawking its Farnborough squawk - would not have been readily apparent on the OCK SC's display who was thus not aware of the impending conflict. Thus the responsibility for detecting the C303 remained entirely with the BE200 crew – which they did – sighting it at a range of about 1000m and affording appropriate visual separation. Therefore, both pilots had been aware of each other's ac, but no avoiding action had proved necessary. Consequently, the members concluded that this report had been the result of a conflict in the FIR, but in the Board's view no risk of a collision had existed.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in the FIR.

Degree of Risk: C.

AIRPROX REPORT No 203/02.

AIRPROX REPORT NO 203/02

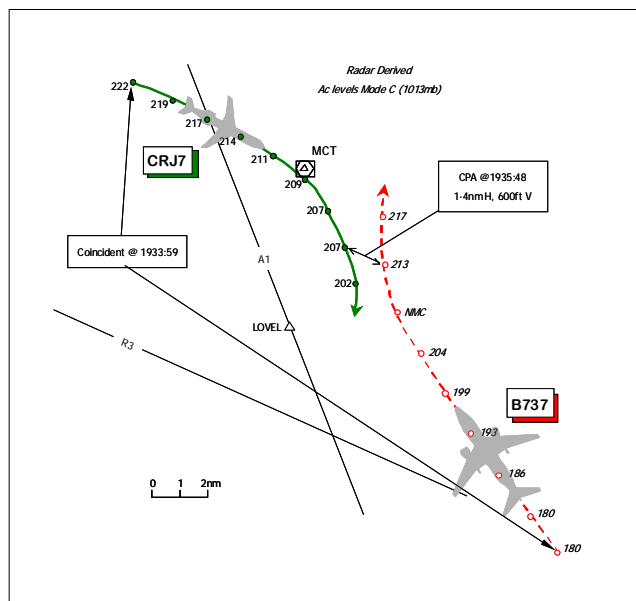
Date/Time: 15 Oct 1935 Night
Position: 5318N 00212W (4nm SE MCT VOR)
Airspace: Manchester TMA (Class: A)
Reporter: MACC S29 & STAFA Sector Control Teams

<u>First Aircraft</u>	<u>Second Aircraft</u>
<u>Type:</u> CRJ7	B737
<u>Operator:</u> Civ Comm	CAT
<u>Alt/FL:</u> ↓FL200	FL200↑

Weather IMC IMC
Visibility: NK NK

Reported Separation:
NK NK

Recorded Separation:
1.4nm H, 600ft V



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE MACC S29 CO-ORDINATOR reports that the STAFA Co-ordinator called to request higher level for an East Midlands departure, the B737, against traffic at LYNAS. However, the request was refused as the S29 Radar Controller had 3 Birmingham inbound descending to FL200. The STAFA Co-ordinator was advised to leave the B737 standard [UKAB Note: To be at FL190 by WHI] or go E of the MCT with the prospect of higher. The STAFA Co-ordinator then called back to request higher for the B737 and was given FL220 subject to the Birmingham inbound. The B737 was observed level at FL180 and fly past 2 of the Birmingham inbound, but it then climbed into conflict with the third, the CRJ7.

THE STAFA CO-ORDINATOR reports that 3 southbound Birmingham inbound were in descent towards the MCT. The B737, outbound from East Midlands, was given a co-ordinated climb to FL220 subject to STAFA Sector providing separation against the inbound. The trainee radar controller was informed that STAFA Sector was to provide separation against the inbound. The sector was busy and the mentor took control. The mentor was informed again that STAFA

sector was providing separation [against the Birmingham inbound].

THE STAFA RADAR MENTOR reports that his trainee was coping well with a busy sector. The B737 departed East Midlands but seemed to need several calls on each occasion to be roused. There were 2 Birmingham inbound at the MCT on parallel hdg with a third some distance behind tracking approximately W of the MCT towards CHASE at FL230. At this point the Co-ordinator advised that S29 had approved a climb to FL220 for the B737. Both he and his trainee thought that by keeping the B737 tracking E of the MCT separation against the third Birmingham inbound, the CRJ7, would be maintained. Subsequently, the CRJ7 called on frequency approaching the MCT, descending to FL200 and tracking about 130° in direct conflict with the B737. The trainee tried to call the B737 to turn it but without response. Consequently, he called, established contact with the B737 crew and issued avoiding instructions to turn R.

[UKAB Note: Reports were also received from the S29 Radar and STAFA Radar trainee controllers.]

THE CRJ7 PILOT reports that he was on a positioning flight from Goose Bay to Birmingham and in contact with MACC. Whilst in descent at 290kt [UKAB Note: Actually subject to ATC speed control 250kt] on a radar hdg [UKAB Note: ATC had instructed routeing MCT – LIC – CHASE], TCAS gave a TA on traffic about 5nm ahead at the same level. The frequency was busy and when a gap in communications allowed he notified ATC and ATC gave avoiding action.

THE B737 PILOT reports that he was outbound from East Midlands for Dublin, climbing to FL220 and in receipt of a service from MACC. When passing about FL200 the crew received a TA. As PNF he was off the air getting the weather and had been called by the cabin crew. Then a TCAS RA enunciated, "Monitor vertical speed" he thought. The FO, as pilot handling, heard ATC call to turn R on to 320°, he thought, and started to turn although did not respond on RT immediately. He responded to the second call a few seconds later, by which time he had been joined on Box 1 by PNF. In hindsight, he acknowledged that he was a few seconds too slow in doing this. The ac was turned R and the opposing traffic descended through their level down the port side. He imagined that the other ac got quite close, although he had no visual contact in IMC. ATC implied that the crew had not helped by missing "numerous" calls, though the FO insisted that although he did not respond to one call he had reacted straight away.

ATSI reports that the STAFA Radar position was manned by a mentor with an experienced trainee who, he considered, was close to achieving a Certificate of Competence for the sector. The mentor described the workload as medium/high at the time of the incident.

The B737 established communication with the STAFA Sector, at 1927, reporting passing FL50, climbing to FL60, on a Wallasey (WAL) SID from East Midlands. The trainee instructed the flight to climb to FL100 and, shortly afterwards, placed it on a radar hdg of 315°. At 1929, the B737 was given a turn onto a hdg of 280°, to shorten its routeing towards WAL and AWY L975, en route to Dublin. Subsequently, the crew was issued with climb to FL160 and passed a tactical hdg adjustment onto 295°.

At 1931, the STAFA Co-ordinator telephoned the S29 Co-ordinator to request a higher level for the B737, in order to resolve a potential problem with traffic further W. After some discussion, because of 2 southbound ac into Birmingham that would be descending to FL200 together with assurance by S29 that the other traffic to the W was not a problem, it was agreed to transfer the B737 climbing to FL190. However, the mentor decided on a plan that would route the B737 to the E of the 2 Birmingham inbounds and then cross behind. Accordingly, he prompted his trainee to place the B737 on a radar hdg of 330° and the flight was cleared to climb to FL180. The S29 Co-ordinator initiated a telephone call to the STAFA Co-ordinator, at 1932:30, when he agreed FL220 for the B737, subject to the original traffic plus a third Birmingham inbound. The STAFA Co-ordinator accepted this condition.

The STAFA Co-ordinator wrote in his report that he informed the trainee that the B737 was co-ordinated to climb to FL220, with the proviso that she was to provide separation against the 3 Birmingham inbounds. The Co-ordinator also reported that when, subsequently, the mentor took control of the RTF, he told him that the STAFA Sector was responsible for separating the B737 against the Birmingham traffic. The STAFA Radar mentor stated, at interview, that he believed that he had to provide separation only from the 2 original Birmingham inbounds, not the third. He believed that this was also his trainee's understanding. As this co-ordination took place without being recorded, it is not possible to reconcile the differing recollections of the controllers concerned. He confirmed that he was aware of the third Birmingham inbound (the CRJ7), tracking about 15nm behind the other 2, but assumed that it would be routed by S29, on its present southerly hdg, to the W of the Manchester (MCT) VOR at FL230, although there was no fps marking to indicate this plan of action. It is noticeable that the B737's STAFA fps shows the co-ordinated climb to FL220, with transfer to S29's frequency, but nothing to indicate that co-ordination had been agreed subject to separation being provided from the Birmingham inbounds. The MACC MATS Part 2, page FPS 2-5, illustrates the fps marking for co-ordination, which has been effected on climbing traffic, subject to separation being provided from other ac. The fps should be annotated with the callsign of the ac concerned. In the event, just as the B737 was

AIRPROX REPORT No 203/02.

instructed to turn onto a hdg of 330° by the STAFA Sector, the S29 Radar Controller was routeing the CRJ7 to the MCT, descending to FL200 iaw the Standing Agreement between the 2 sectors. Radar timed at 1932:00 shows the CRJ7 on a southerly hdg, passing FL234, with the B737 still hdg 295°, passing FL164. The 2 ac are 49.9nm apart. By the time the STAFA Radar trainee clears the B737 to climb to FL220, at 1933:50, radar reveals that both ac are established on their respective cleared routeings, 26.5nm apart, the B737, tracking NW, is at FL180 with the CRJ7, tracking towards the MCT, passing FL224. The mentor could only surmise that because he had believed that the situation between the subject ac had been resolved, he had discounted the presence of the CRJ7 when allowing his trainee to clear the B737 to climb to FL220. Consequently, not appreciating that they were now on conflicting profiles he turned his attention to the traffic situation elsewhere in the sector.

The CRJ7 pilot made his initial call on the frequency, at 1934:30, when the 2 ac were 18.1nm apart. He reported descending to FL200, with a speed of 250kt, the transmission being acknowledged by the trainee. Shortly afterwards the mentor noticed the potential confliction between the subject ac and prompted his trainee to turn the B737 R. She transmitted: "*C/s turn R now hdg 010°*". No acknowledgement was received from the pilot but it is not known if this was because the trainee used an incorrect flight callsign [ie inadvertently using the designator of the parent rather than its subsidiary company with the correct flight no]. The mentor then took over the RTF and instructed the B737 (using the correct callsign) to turn R hdg 010° and expedite its climb to FL220. In response to a request for the transmission to be repeated, the mentor instructed the flight to turn R hdg 030°, using the term '*avoiding action*' but not the revised phraseology. The pilot reported having received a TCAS TA. It was only later, in his written report, that the pilot stated that he had received a TCAS RA whilst climbing through FL200. The CRJ7 pilot was then instructed to turn R hdg 220° and descend to FL180. Receiving a readback, of the new hdg, the mentor transmitted: "*It's a tight turn, avoiding action please, there's traffic, er, just climbing through your level now*". The pilot acknowledged a 'tight turn'. Radar shows that as the 2 ac were about to pass 1.4nm apart, vertical separation was 600ft; the B737, having

responded to the avoiding action turn, was climbing through FL213 and the CRJ7 was descending through FL207, still tracking S. Requisite horizontal separation criterion was 5nm. STCA activated during the encounter.

An important factor in this incident was an apparent breakdown in co-ordination between the STAFA Co-ordinator and the Radar Controller mentor/trainee. The former believed he had ensured that the latter were aware that they were responsible for separating the B737 from 3 Birmingham inbound. But the mentor equally believed that separation was required against the first 2 inbound. It is not possible to determine the exact nature of what was said between the controllers, although it was obviously open to some doubt and demonstrates again the importance of ensuring that no ambiguity exists during the co-ordination process. Had the B737's fps been correctly annotated by the STAFA Co-ordinator, as required by MACC MATS Part 2, it is probable that any confusion could have been eliminated and the conflict could have been avoided. However, it was still possible for the mentor to have detected the potential confliction, from scanning the radar display, prior to the trainee instructing the B737 to climb to FL220. By the time this clearance was passed, the CRJ7 was already routeing towards the MCT, on a potentially conflicting track with the B737.

UKAB Note (1): Analysis of the Gt Dun Fell radar data recording reveals that CPA occurs at 1935:48, when minimum recorded separation is 1.4nm H and 600ft V apart.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members were agreed that this encounter was the result of a basic misunderstanding on the STAFA Sector between the Co-ordinator and the Radar Control team as to what had been agreed and when. But since no recording exists as to who said what, the differing perceptions of the crucial co-ordination agreement must remain

unreconciled. Nevertheless it was clear to the Board that an audit trail should have been available through the relevant fps, although that in respect of the B737 had not been annotated iaw MATS Pt 2. One civil ATC member suggested that, in mitigation, appropriate annotation would have involved marking the c/s of all 3 Birmingham inbound on the B737 fps and that of the B737 on the fps of all 3 Birmingham inbound, a cumbersome procedure. Rather, he suggested, in cases of similar co-ordination complexity it would have been better for the Co-ordinator to have simply 'pointed out' the relevant traffic to the Radar Control team. Another civil ATC member, whilst agreeing the necessity for 'point out', suggested that adherence to the promulgated procedure would have precluded any such misunderstanding.

The NATS adviser explained that, in respect of an audit trail for controller face-to-face co-ordination, the recent trial of live microphones at LTCC was now complete. Although positioning of the equipment was varied, it proved impossible to get a satisfactory recording as the level of background noise made the tapes extremely difficult to transcribe. Nevertheless, NATS will continue to monitor the situation and as new technology becomes available will consider running operational trials.

Members noted that although the STAFA Radar mentor had noted the CRJ7 tracking S earlier, despite the instructed MCT – LIC – CHASE

routeing, this had been before the S29 Radar controller had corrected the routeing through the expediency of tactical hdg 160° prior to reiteration of the required routeing. As a consequence, the STAFA Radar mentor had discounted the CRJ7's presence when the B737 was turned onto hdg of 330°. More significantly this situation persisted until the CRJ7 established contact on the STAFA Sector frequency, by which time the trainee had already cleared the B737 to FL220.

Airline pilot members, in noting the frank statement of the B737 pilot, agreed that his priorities had been misdirected. They also noted that resolution of this encounter was initiated by TCAS. The Board were agreed that the provision of avoiding action simultaneously with compliance by the B737 crew with their RA had combined to remove any risk of collision.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause:

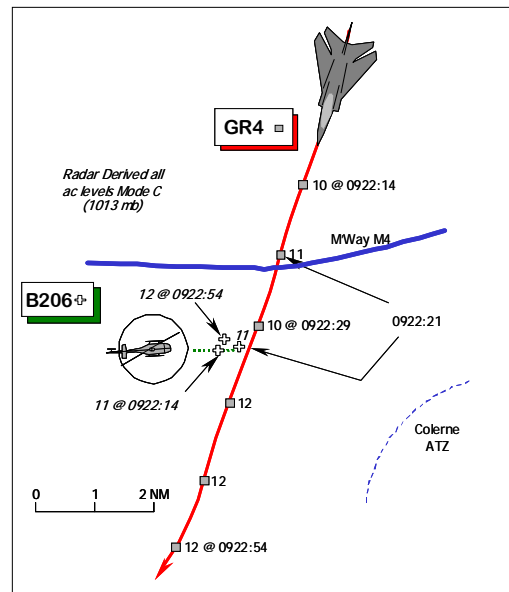
- a. A breakdown in co-ordination by the STAFA Sector Team.
- b. The STAFA Radar Mentor did not take the CRJ7 into account when he allowed his trainee to climb the B737 to FL220.

Degree of Risk: C

AIRPROX REPORT No 204/02.

AIRPROX REPORT NO 204/02

Date/Time: 9 Oct 0922
Position: 5129N 0223W (4nm NW of Colerne - elev 593ft)
Airspace: FIR/UKDLFS - (Class: G)
LFA2
Reporting Aircraft Reported Aircraft
Type: Bell 206 Tornado GR4
Operator: Civ Comm HQ STC
Alt/FL: 400ft 400ft
(QNH) (Rad Alt)
Weather VMC CLBC VMC CLBC
Visibility: 10km 10km+
Reported Separation:
2-300m H, 100 ft V ½nm H
Recorded Separation:
Not recorded



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BELL 206 JETRANGER PILOT reports his helicopter has a silver/black livery and he was engaged in a pipeline inspection sortie at 110 kt. Notification had been given to LFBC under the PINS. The assigned squawk of A0036 was selected with Mode C; TCAS was not fitted at the time. He was not in receipt of an ATS having just left Lyneham's frequency as they turned back toward their destination; the frequency for Bristol/Filton had been selected but the RT was busy and he had not made the initial call.

Heading E in the vicinity of Dyrham, climbing through 400ft ALT up the W face of a ridge, the non-aircrew observer seated on the L spotted the jet first at 10 o'clock and drew his attention to it. He then spotted the Tornado himself about 5-600m away as the jet rolled left and right through 90° which the pilot held for 1-2 sec, before rolling back wings level as the jet crossed from L – R some 2-300m ahead and about 100 ft above his helicopter. He took no avoiding action because he believed that the Tornado pilot had seen his JetRanger, but was concerned that he had flown so close and assessed the risk as "medium". He questioned, "why bother to file PINS", and in a

later telephone conversation with UKAB staff stated that notification produced little tangible benefit.

THE TORNADO GR4 PILOT reports that the HISL was on whilst flying as a singleton on a low-level reconnaissance mission at 400ft Rad Alt through LFA2 in good VMC more than 5000ft below cloud. He was not in receipt of an ATS, but a squawk of A7001 was selected with Mode C; neither TCAS nor any other form of CWS is fitted.

In the vicinity of Colerne, flying straight and level on a heading of 190° at 420kt he spotted a light coloured helicopter at 11 o'clock, he thought [though more probably 1 o'clock] more than 5km away that appeared to be slightly below his ac's height. No avoiding action was taken and the helicopter passed on the beam about ½nm away at the closest point still slightly below his jet; he 'waggled' the wings to acknowledge the helicopter's presence and that it had been seen. From first sighting to passing clear he was in constant visual contact and he considered that the risk of a collision was "zero".

UKAB Note (1): Meteorological Office archive data reveals that the Bristol Lulsgate QNH at 0920 UTC was 1004mb (nothing was available for Filton). The Cotswold RPS 0900-1000 UTC was 1000mb.

UKAB Note (2): The Cleve Hill radar recording does not illustrate this Airprox clearly. The Tornado GR4 is shown continuously as it transits the area on a steady course, but the track of the B206 is somewhat confusing and cannot be determined with certainty. The JetRanger is shown intermittently on an eastbound course at 0922:14, indicating 1100ft Mode C (1013mb). Just before the GR4 crosses the M4 motorway at 0922:21, the jet indicates 1100ft Mode C (1013mb) - the same level as the helicopter and equating to about 830ft ALT Bristol Lulsgate QNH (1004mb). However, contact on the B206 is lost thereafter until 0922:54, whence it appears to have moved NW in the intervening period and is shown at 1200ft Mode C. Just before the estimated position of the Airprox, some 4nm NW of Colerne, the jet's Mode C indicates a 100ft descent to 1000ft, equating to 730ft ALT (about 530ft agl above the 200ft ground elevation contour in this vicinity) before climbing back up to 1200ft Mode C as it continues southbound.

UKAB Note (3): This Airprox occurred within PINS Gas Area J3; the am PINS NOTAM for this day - UKLB2762 - was transmitted 081849Z Oct and notified this area – amongst others - as being active 07 - 1100UTC.

THE TORNADO GR4 PILOT'S STATION COMMENTS that the GR4 pilot attained an early spot, maintained visual contact, ensured that there was no risk of collision and indicated to the helicopter pilot that he had seen him by a wing rock.

HQ STC comments that while the GR4 pilot did see and avoid the helicopter, he could have given the JetRanger pilot a greater degree of comfort by a more positive horizontal and/or vertical manoeuvre. This Command concurs that the current PINS reporting system is so vague that it affords no protection. It is recommended that PINS helicopter pilots file accurate route, position and time information to make the PINS system more effective. This would potentially improve the accuracy of information available to military pilots

leading to an improved level of protection and reduce the potential for Airprox incidents.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available to the UKAB included reports from the pilots of both ac, and a report from the appropriate operating authority.

It was evident that this Airprox stemmed from lookout in the 'see and avoid' environment of the FIR/UKDLFS and the helicopter pilot's concern over the separation that pertained. The B206 pilot proceeding about his pipeline inspection said he spotted the jet as it crossed from L-R some 2-300m ahead of his helicopter, after his observer in the left hand seat had warned him of its presence. Whilst in terms of the 'Rules of the Air' the JetRanger ultimately had right of way in this situation, it was a late spot nonetheless and there was little the helicopter pilot could have done subsequently to effect the outcome of this encounter. It was noted that the B206 pilot, though climbing up the W face of a ridge was probably below the recommended height band for pipeline inspection flights (5-700ft agl) and the military FJ was above the height-band where the AIC suggests military ac will operate (<500ft agl). However, the GR4 pilot had seen the helicopter in time - 5km away – and judged that avoiding action was not needed as he continued along his planned route. It would appear that the GR4 pilot's energetic 'wing waggle' manoeuvre was not recognised by the helicopter pilot as a signal that his ac had been seen. In the Board's view acknowledgement of another ac's presence is a very helpful thing to do and can give reassurance to those pilots who have been caught unawares, but here the JetRanger pilot was mainly concerned about the separation afforded to his helicopter by the GR4 pilot who thought the helicopter passed ½nm away. Although the radar recording did not illustrate the Airprox clearly and the minimum horizontal separation could not be determined with any certainty at the closest point, in the Board's view the track of the jet compared to the preceding radar return of the B206 at 0922:21, suggested that the GR4 had passed significantly closer than ½nm away and more akin to the B206 pilot's estimation. No minimum horizontal separation is promulgated for chance encounters between ac flown in the 'Open FIR'

AIRPROX REPORT No 204/02.

environment of Class G airspace under VFR. Instead, pilots are left to use their judgement. In this case the Board echoed the Command's opinion and concluded that the GR4 pilot had flown close enough to cause concern to the JetRanger pilot. Nevertheless, the GR4 pilot had kept the helicopter in sight throughout and could always have turned away if need be. Additionally, the JetRanger pilot had deduced that no avoiding action was required, which convinced the Board as a whole that no risk of a collision had existed here.

However, a BHAB member expressed grave concern over this Airprox, because he thought that the GR4 pilot had afforded inadequate separation to the helicopter. In his view the GR4 pilot flying at 420kt was irresponsible; even if he had afforded ½nm it would have been too close and he believed that jet pilots should be required to avoid helicopters in the FIR by at least 1nm laterally. This was a solitary view and engendered no support from other pilot members who opined that to prescribe such a measure would be unrealistic in Class G airspace. The helicopter pilot member added that the B206 pilot had availed himself of certain measures available to him including filing PINS, but short of having TCAS (which was now fitted to this operator's entire fleet) there was little else a helicopter pilot could do to counter the threat from low-level fast jets flying at 420kt or more in the FIR which were very difficult to detect visually. He voiced concern over the apparent lack of action, stating that the BHAB had already entered into a dialogue with the MOD and had made their concerns plain; he suggested that the UKAB should be more proactive on this issue. Whilst recognising his concern, the chairman emphasised that each operator – civilian or military alike – had a legitimate right to proceed about their lawful occasions in Class G airspace. The Open FIR was not the exclusive preserve of any 'operator' and each must give 'due regard' to other airspace users. He stressed that some helicopter operators had now gone to significant expense to equip their ac with Skywatch, which members agreed was definitely a step in the right direction. The Board looked forward to the time when the military FJ fleet is universally equipped with a CWS device, but this would not have materially altered the situation here, where the FJ pilot had spotted the helicopter at range and in the Command's view, as endorsed by the Board, had

not given the helicopter a wide enough berth, which was the crux of the issue.

Discussion then turned to the PINS as a means of affording protection – an imperfect system as emphasised by the JetRanger pilot's remarks. The deficiencies of PINS are well known and the Board was briefed that this was recognised by the PINS Working Group (WG) themselves. The STC members stressed that until the helicopter operators could identify their movements more accurately and refine the time frame or location significantly for promulgation to military pilots, PINS would not provide a useful warning to other operators on the position of the pipeline inspection helicopter. Effectively, the PINS NOTAM here specified to military crews that a helicopter might be encountered somewhere in southern/central England between E Wales and the Norfolk coast within a 4 hour time block and was no more specific as a warning than that. The STC OPS LF advisor added that the weaknesses of the current PINS are well recognised; historically PINS operators have been unable to provide more accurate route details and though the helicopter will invariably be flying within a few hundred meters of the pipeline, the pipeline company has been reticent to release pipeline location details. Nonetheless, following a study of Airprox within the UKLFS over the last 3 years, a small number of Airprox locations have been identified as 'hot spots'. The Board was therefore encouraged to learn that, through the CANP and PINS WG, it has been agreed to conduct a 6 month trial, whereby PINS ac operating in the immediate vicinity of the 5 sites identified in the study will be granted CANP LFS avoidance area status. The trial will be subject to procedures promulgated in an AIC, which it is anticipated will be released in mid Sep 03. The chairman requested that the Board be appraised of the results of this trial in due course.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Tornado GR4 pilot flew close enough to cause concern to the JetRanger pilot.

Degree of Risk: C.

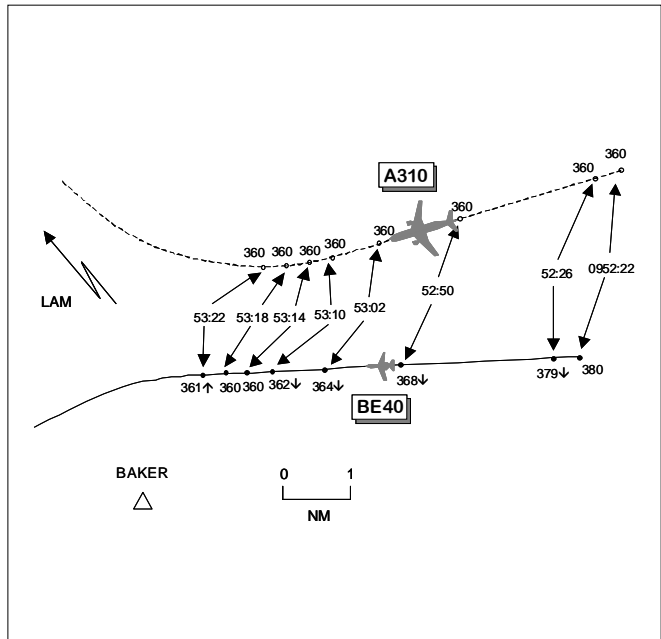
AIRPROX REPORT NO 205/02

Date/Time: 14 Oct 0953
Position: 5132N 0021E (10nm SE LAM)
Airspace: UAR (Class: B)
Reporter: LACC S2T

	<u>First Aircraft</u>	<u>Second Aircraft</u>
<i>Type:</i>	BE40	A310
<i>Operator:</i>	Civ Pte	CAT
<i>Alt/FL:</i>	FL380	FL360

Weather: VMC CLOC VMC CLOC
Visibility: Unltd
Reported Separation:
 not seen 400ft V 1-1.5nm H

Recorded Separation:
 1.9nm H

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

THE LACC S2 TACTICAL CONTROLLER reports that during an overload situation the BE40 pilot announced that he was descending from FL380 to FL360 owing to turbulence. As the A310 was flying immediately underneath the BE40, he told the BE40 pilot to maintain FL370 and gave avoiding action to both ac, turning both 90° off-track. After moving the TDBs, which were flashing and garbling, he saw the BE40 already descending through FL364 before stopping at FL362 and commencing climb back to FL370.

THE BE40 PILOT reports heading 270° at 440kt and cruising at FL380 into a strong (120kt) headwind. He was flying in VMC with unlimited visibility and was receiving an ATS from LACC. Within fractions of a second, the ac encountered a sudden increase in airspeed which led to an overspeed warning, while losing altitude. Whilst trying to clear this situation, seconds later the airspeed dropped to minimum. All efforts to get out of this situation by using max power and pitching the ac's nose up to the limit were unsuccessful. The descent rate was so high, it was beyond the ac's performance to overcome the high sink-rate associated with the turbulence; this lasted for about 10-15sec with the ac reaching

FL362 before full control recovery was possible. Immediately upon realising that the ac was unable to maintain FL380, the PNF called London ATC reporting that they were flying in heavy turbulence and were unable to maintain altitude. In thousands of hours flying experience, he had never encountered turbulence of such magnitude. He followed the ATC instruction to turn onto a southerly heading and climbed back to FL370, before eventually regaining course and climbing back to cruising level FL380. He did not remember hearing about nor seeing any other ac during his emergency descent. The ac was not fitted with TCAS.

THE A310 PILOT reports heading 270° in the cruise at FL360 in VMC. London ATC issued a R turn of 90° almost simultaneously with TCAS giving a TA warning. The other ac was seen 1-1.5nm to his L, turning away to his L about 400ft above. He assessed the risk as 'minor'.

LACC ATCI reports that the ATCO involved was acting as S2 (LUS E) Tactical Controller (S2T). The sector had just been split because of the complexity of the traffic situation caused by numerous requests for level changes and

AIRPROX REPORT No 205/02.

information regarding the turbulence. The S2T was busy with several calls when the BE40 pilot reported (0952:50) that he was descending to FL360 because of heavy turbulence. Reacting quickly, the S2T advised the BE40 pilot to maintain FL370, as there was traffic below.

Sensing that the BE40 would pass this level, the Tactical Controller issued avoiding action to the A310 (shortly after 0953:00) of an immediate turn onto heading 350°. In his report, the S2T stated that his recollection of the displayed Mode C of the BE40 was FL364 before the ac climbed again. The Work-Station replay TDB and the Node L recording both showed the BE40 at FL360 before returning to FL370. The S2T also turned the BE40 onto heading 180° (just after 0953:10) in an attempt to regain separation; in the meantime the A310 pilot reported the traffic in sight. The S2T's prompt action quickly resolved the situation and both ac were returned to their own navigation.

As already mentioned this incident took place while both S2 Tactical and Planner were very busy and in fact S2 (LUS W) had just been split from S2 (LUS E) as had S25/S26 (LMS). The S2 Planner reported that he was so busy with ancillary tasks that he could not keep up with the electronics. He had been refusing traffic into the sector and then had been questioned by the offering sector, by telephone, as to the reason. The main cause for this increased workload stemmed directly from the localised severe turbulence; an Overload report will be published to cover this occurrence in due course (OV-0080-02). Although there was an STCA, SMF was not triggered.

ATSI endorsed the LACC report.

UKAB Note: The Heathrow radar recording at 0952:22 shows the BE40 14nm ESE of LAM tracking 270° at FL380 2.9nm SSW of the A310 cruising at FL360; 4 sec later the BE40 is seen commencing descent. When the BE40 pilot calls on the RT in descent at 0952:50, the BE40 is seen descending through FL368, 2.4nm SSW of the Airbus. The BE40 levels at FL360 at 0953:14, CPA occurring 4 sec later with the subject ac passing 1.9nm horizontally apart at the same level. The next radar sweep shows the A310 turning R with the BE40 commencing a L turn indicating FL361 climbing.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Although it was clear that severe turbulence had caused the BE40's enforced descent, which put it into conflict with the A310, members wondered what lessons could be learnt from this incident. Pilot members believed that the degree of turbulence experienced by the BE40 crew had probably been a function of the ac's small size and that the recovery manoeuvre, required to overcome this phenomenon, would have been almost certainly close to the edge of the ac's performance envelope. With the benefit of hindsight, ATCOs opined that owing to the BE40's rapid departure from its cleared flight level, its crew could have declared a 'Mayday' as soon as practicable on the frequency to alert all parties to the severity of the situation in the busy upper airspace above London. However, it was understandable that the BE40 crew would have been busy in the cockpit giving priority to the handling the ac, eventually communicating the problem to ATC; it brought to mind the aviation adage of 'aviate, navigate and communicate'.

Turning to risk, the S2T's prompt actions were commended by the Board during this traffic overload situation. Although he had initially tried to provide vertical separation, he had also given coarse avoiding action turns to increase the horizontal separation distance. The BE40 crew were able to take full recovery action as the ac 'bottomed out' at FL360 by commencing a climb and turning L as instructed. Meanwhile, the A310 crew had initiated a R turn and visually acquired the BE40, 1-1.5nm to their L and above, while TCAS gave them a TA warning. The recorded radar had shown the laterally displaced tracks slowly converging but the BE40 was ahead of, and slowly pulling away from, the A310 until both aircrews' actions had started to take effect. Although the Board were mindful that there had been the potential for a close encounter during

the descent phase of the BE40, on this occasion there was no other ac immediately below. Instead, the geometry of the encounter combined with the S2T's avoiding action instructions and A310 crew's visual sighting had been effective in removing any risk of collision.

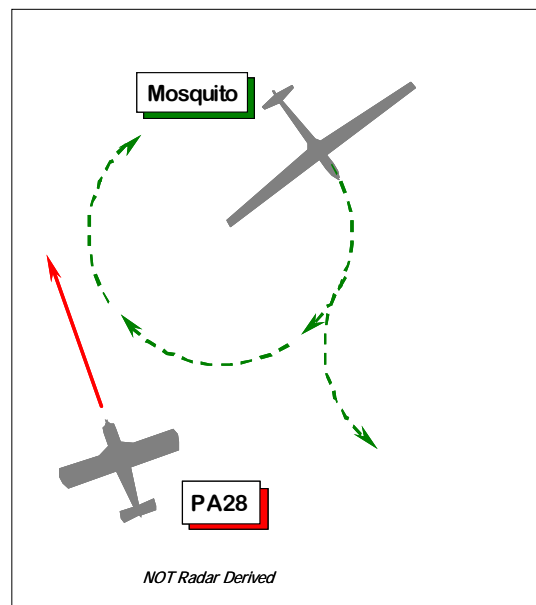
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: In a period of severe turbulence, the BE40 pilot was unable to maintain his flight level and descended into conflict with the A310.

Degree of Risk: C

AIRPROX REPORT NO 206/02

Date/Time: 19 Oct 1555 (Saturday)
Position: 5344N 0108W (2¼nm WSW of Burn Glider Site - elev 20ft)
Airspace: Vale of York AIAA (**Class:** G)
Reporting Aircraft **Reported Aircraft**
Type: Mosquito Glider PA28
Operator: Civ Pte Civ Club
Alt/FL: 1700ft 1500ft
 (QFE) (QFE)
Weather VMC CLBC VMC CLBC
Visibility: >20NM >10km
Reported Separation:
 150-200ft H, 75ft V 1000m H, nil V
Recorded Separation:
 Not recorded



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE MOSQUITO PILOT reports his glider is coloured white with red wing tips and he was in communication with Burn Gliding Club on 130.1MHz. At a position about 2¼nm WSW of Burn glider site (a GPS reference was quoted) he was climbing slowly and turning R in a thermal at 43kt with each complete revolution of the R turn taking about 30sec. Turning though SE he spotted another ac about 1nm away over the nose turning towards his ac. He continued turning at about 40° AoB to provide maximum conspicuity of his glider to the pilot of the other ac – a low-wing single engine red/white ac, now flying straight and level on a NW'ly course. After one further complete revolution the other ac was now very close and still heading towards his glider, so to avoid it he straightened out of the turn onto a

parallel/diverging course away from it. The other ac passed 75ft below and 150-200ft to starboard, but its pilot did not appear to change course at all. He rocked his glider's wings as the ac flew past. He assessed the risk of a collision as "medium to high".

THE PA28 PILOT reports his ac has a red/white colour scheme and the HISL was on whilst returning from Old Buckenham to Sherburn-in-Elmet at 1500ft Sherburn QFE, with another pilot in the RHS. They were flying about 2000ft below cloud with an in-flight visibility of >10km. Neither he nor his co-pilot was "aware of any Airprox", but he provided comprehensive details of two sightings of gliders during the flight.

AIRPROX REPORT No 206/02.

[UKAB Note (1): The first encounter detailed here was in all probability that reported by the glider pilot, the second encounter was within the Sherburn-in-Elmet Cct area.]

Approaching Sherburn-in-Elmet from the S, after turning at Eggborough Power Station (SW of Burn) for an overhead Cct join at Sherburn, the prevailing visibility was good, which enabled him to see Burn Glider Site clearly on their track of about 340° (he did not report his TAS). The standard procedure is to fly in to Sherburn-in-Elmet at 1500ft QFE and depart the Cct at 1000ft till clear of Church Fenton's MATZ. SW abeam Burn, a glider was seen to starboard at a range of 1500m turning away to the L, which "*they guessed was turning towards Burn*". The landing light was turned on to increase conspicuity and he turned his ac slightly L in case the glider pilot had to turn to adjust his track or height. If he had turned R it would have caused a conflict; he supposed the glider was heading to Burn and any R turn would have placed his ac between the glider and the Burn glider site. At the closest point, he believed the glider passed about 1000m to the R at the same height as his ac and he certainly did not consider that this was an Airprox.

He opined that as an "*ex-glider pilot*", he was more than aware of giving glider club airfields a wide berth and was conscious of the limited manoeuvrability of a glider that required power driven flying machines to give way to sailplanes.

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

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

The only information available was reports from the pilots of both ac.

It was plainly evident that each pilot had seen each other's ac at some stage during this encounter and the glider would clearly have right-of-way in these circumstances. But the 'Rules-of-the Air', insofar as they applied here, can only work if pilots have spotted each other's ac in good time.

Unfortunately, it was not feasible to establish the exact geometry at the time of sighting with any

certainty and each pilot would not have known if his ac had been seen at this point. The glider pilot, who had right of way, spotted the PA28 1nm away, possibly before the PA28 pilot saw the Mosquito and had elected to continue his orbit within the thermal. The light ac would not have been visible throughout this R turn as his glider went 'belly-up' and meanwhile the PA28 had flown on in to closer quarters. At a closing speed in the order of 110kt this was not surprising. It seemed that the glider pilot had reasoned that turning at 40° AOB made his ac conspicuous and that the PA28 pilot was bound to see him (and turn away) – such assumptions are unwise and often lead to awkward situations such as that reported here. A better course of action would have been for the Mosquito pilot to straighten-up for a short while on a diverging heading, leaving the thermal if need be, thus ensuring that the PA28 passed well clear, before resuming the R turn. Whilst the PA28 pilot had definitely seen a glider and made a small turn to give what he thought was more room to the glider pilot to manoeuvre, there was no conclusive assurance that he had seen the glider flown by the reporting pilot. But if he had, the course adjustment was probably not enough. A controller member familiar with this area explained that on fine weather weekends the volume of GA and glider flying could reach extremely high levels of traffic density, frequently in the vicinity of this popular glider site. Members concluded that, in all probability, the PA28 pilot had seen the Mosquito but the minimum separation and some aspects of the geometry did not tally with the glider pilot's report, which members tried to resolve. The PA28 pilot reported seeing a glider turning L - the Mosquito only turned L once both ac had flown into close quarters. Whereas the PA28 pilot said the minimum horizontal separation was 1000m (>½nm), the glider pilot said it was sixteen times closer at just 200ft. Some members contended that the PA28 pilot was mistaken and had assumed the glider was going to Burn when in fact the glider was actually turning R as reported by its pilot. Members agreed that the PA28 pilot had probably taken sufficient action to remain clear if he believed that the glider was 1000m away at the closest point, but that was not the view of the glider pilot. Members wondered if the PA28 pilot had then perhaps discounted the glider believing the conflict resolved and subsequently lost sight of it as it turned in its orbit such that it was just off the starboard wing - unseen either by he or his colleague in the right hand seat - when the glider

pilot turned L to avoid the light ac and passed 150-200ft away. Unfortunately none of the recorded radars had captured this event. Recognising that white gliders against a cloudscape are extremely difficult to keep track of when manoeuvring, some members thought that the PA28 pilot had flown close enough to the glider (possibly unseen at the time) to cause concern to the Mosquito pilot. Other members reaffirmed that notwithstanding any 'right of way' rules, the glider pilot had effectively taken no action to ensure early resolution of the identified conflict. He had seen the PA28 at 1nm, elected to continue in his thermal and then gone unsighted on the light ac for a short time as he continued the R turn, and then had to take avoiding action himself against the PA28 at close quarters. The question here was should the glider pilot have taken action to stay clear of the PA28 when he spotted it earlier? In the Board's view he could and should have

done so, which would have been a wiser course of action. In this see and avoid environment the lessons here were to give other airspace users as wide a berth as is feasible and do not assume you have been seen. After lengthy debate the Board finally concluded that this Airprox had resulted from a conflict in the FIR, which had ultimately been resolved by the avoiding action of the glider pilot despite having right of way. In the Board's opinion, this was enough to ensure that no risk of a collision had existed in the circumstances reported here.

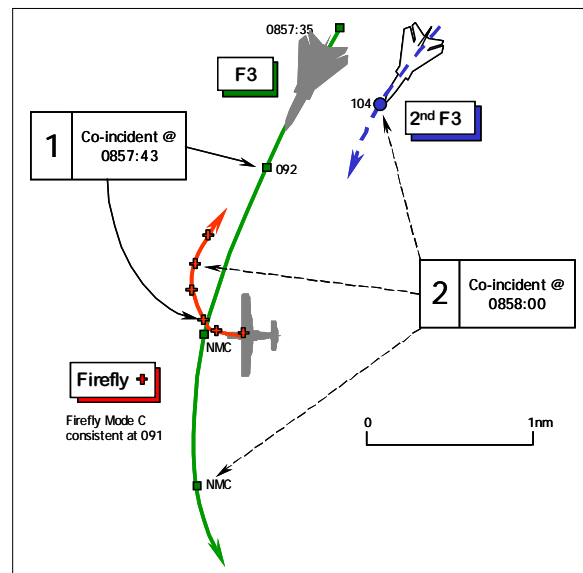
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A conflict in the FIR.

Degree of Risk: C.

AIRPROX REPORT NO 207/02

Date/Time: 23 Oct 0857
Position: 5254N 0020W (10nm E of Barkston Heath)
Airspace: Lincolnshire AIAA (Class: G)
Reporting Aircraft Reported Aircraft
Type: No3 Tornado F3 Firefly 260
Operator: HQ STC HQ PTC
Alt/FL: 8400ft FL90
 RPS (985mb)
Weather VMC CLOC VMC CLAC
Visibility: 30km >20Km
Reported Separation:
 600ft H, 600ft V No3 F3 not seen
Recorded Separation:
 c260m H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE TORNADO F3 PILOT reports that he was the No3 singleton of a 3 ac formation engaged in a 2v1 air combat training (ACT) exercise under a RIS from London MILITARY. His ac was coloured grey and was displaying navigation lights and

HISLs. Transponder with Mode C was on but TCAS is not fitted. He had disengaged from the "merge" at the nominated ACT 'floor' altitude of 8500ft RPS (985mb), heading about 210° and whilst running ahead of the Nos1/2 astern he had

AIRPROX REPORT No 207/02.

achieved a speed of 540kt. Whilst concentrating on the Head Up Display (HUD) indications of Mach number and altitude, he sighted a yellow light ac (LA), which appeared in the bottom of his HUD field of view about 1000yd away. He pitched up and rolled L to avoid the LA, which passed 600ft to starboard with about 600ft of vertical separation at the CPA. The risk of collision was assessed as "very high". London MILITARY did not call the conflicting ac until 0858:17, when they then stated that the RIS was limited due to high traffic density. The other two opposing Tornados were following astern at ranges of 2 and 3nm respectively, but were not involved in the encounter.

THE FIREFLY 260 PILOT, a QFI, reports that he was instructing an early IF training exercise, with the student pilot in the right hand seat (RHS) wearing an IF visor; it was the student's second IF sortie. His ac was coloured yellow with black undersides and HISLs were on. A squawk of A2642 was selected with Mode C - indicating to controllers that he would be operating above 4000ft in the "Lincolnshire Agreed Airspace" - but he was not in receipt of an ATS; TCAS is not fitted. Flying level at FL90 at 140kt, after visually clearing the area he instructed the student to carry out a 360° R turn at 20° AOB and it was as the ac was turning R from W through N that a Tornado [not the No3] was spotted about 1000-1500m away approaching from the right slightly above his ac and apparently manoeuvring as if taking avoiding action. He took control of the ac from the student and stopped the turn; it appeared to him that the Tornado would pass clear to the right, which it did. Horizontal separation was about 500m, with both ac on approximately reciprocal headings. Once the Tornado had passed clear, the right turn was continued, whereupon it became apparent that the Tornado he had seen was in fact about 1nm behind another Tornado – the No3 flown by the reporting pilot - which had passed unseen. The third Tornado, which he only became aware of after landing, was not seen either.

MIL ATC OPS reports that the formation of 3 F3s was operating under a RIS (in the Lower/MAS) from London MILITARY Controller 14 (CON14) between 5000-34000ft Barnsley RPS (987mb). No 1/2 were operating as a pair with the No3 as a singleton.

At 0857:45, the reporting F3 pilot called "*terminate, terminate, stranger my nose one mile*", which was acknowledged by the other pilots. Between 0857:57 and 0858:06, there were intra-formation RT calls made between the F3 crews about the LA, in an attempt to get all 3 formation crews visual with it. CON14 then passed traffic information at 0858:17, "*...manoeuvring traffic in your vicinity indicating FL90*", whereupon one of the F3 pilots acknowledged with visual contact on the LA. At 0858:23, CON14 then added "*...and its limited traffic information in that vicinity due to high traffic density*", which was acknowledged. At 0900:26, after further intra-formation RT transmissions, the No3 reported that "*...that...last stranger we came close to we assess as an Airmiss [sic] certainly in [C/S]3*".

Analysis of the Claxby radar recording shows at 0857:39, the No3 F3 heading SSW on a London Mil A6143 squawk indicating FL98 Mode C, and the Firefly, on a A2642 Barkston Heath conspicuity squawk, indicating FL91 Mode C in the No3 F3's 12 o'clock - 2nm tracking east to west. Six seconds later, separation has reduced to 1nm and the F3 is shown 100ft above the Firefly, which has now entered the reported R turn. Due to the number of ac in the area it is difficult to see any more detail than this but on the radar replay on a larger scale, at 0857:57 the tracks appear to have less than ½nm separation.

The formation was working in the Lincolnshire AIAA notified in the UK Mil AIP ENR at 5-2-4 para 3.5, as between 2500ft amsl and FL180. At the time of the Airprox the traffic density was high, though CON14 had not limited the radar service and had not appraised the formation of other traffic that was operating close by. A limitation of service should have been provided in accordance with the rules contained in JSP 318A Section 2 235.140.2, which state, "*Radar services are to be limited... when the aircraft is...in areas of high traffic density*", but the F3 formation should have been provided with traffic information within the AIAA. The Supervisor reports that he "*observed a number of returns in the Cranwell vicinity – one aircraft indicated FL90 – so it was impossible to determine which aircraft the F3 pilot was referring to*". In mitigation, there was very little opportunity for any intervention from CON14 as the chatter is continuous from 0857:01 amongst the formation allowing no external RT. The Unit reports that the controller was also conducting a handover to

Norwich on VHF traffic at the time of the Airprox that could have distracted CON14's attention away from the manoeuvring formation. As soon as a window of opportunity became available, CON14 did pass traffic information about the LA and stated that the RIS was limited, albeit after the Airprox had occurred. The controller has been fully debriefed on this incident and has acknowledged the foregoing, the lessons learned have also been included in the Unit's Standards Bulletin.

THE TORNADO F3 PILOT'S UNIT comments that the Tornado crews were correctly conducting a training exercise in a busy piece of airspace. The formation had tried to obtain GCI control but this had not been available and was, therefore, using a RIS from London MILITARY. The No3 crew's workload at the time was assessed as "medium", with the pilot clearing the flight path ahead and monitoring HUD indications as he approached his minimum authorised altitude and maximum authorised speed. The ac's AI radar was set up to clear the area ahead, but there was no radar contact with the LA, probably due to the short range and aspect. The navigator's lookout was mainly directed astern. Thus the late sighting occurred without the benefit of a warning from ATC or AI radar.

UKAB Note: The Claxby radar recording does not show this Airprox entirely as the No3 F3's Mode C is not evident as the jet passes astern of the Firefly at the critical moment. However, the No3 Tornado is shown at 0857:43, – just before the CPA – at FL92, 100 ft above the LA indicating FL91 Mode C. On the next sweep timed at 0857:51, the No3 F3 has passed in the order of 260m starboard - starboard with the Firefly, before the jet opened astern of the LA, which is still level at FL91 Mode C in the R turn.

HQ STC comments that this Airprox occurred in the very busy area of the Lincolnshire AIAA. All ac operating in this area need to be critically aware of the need for assiduous lookout at all times. It is disappointing to note that the Firefly was flying with compromised lookout and no ATS, while the F3 pilot admits to being focused **on** the HUD, and not **through** the HUD scanning for possible conflicts. Meanwhile the Navigator was looking behind at the other formation ac, and thus was not looking ahead or scanning the radar. The F3 crews may have over-relied on the ATS for

conflict alerting and they should have been warned earlier that the service was limited. However, the responsibility of clearing their flight path was firmly that of the F3 crew.

HQ PTC comments that this was not the sort of airspace in which to be carrying out ACT in a 3-ship at M0-88. A RIS can offer only a false sense of security under such circumstances, given the need for intra-formation chatter, the unpredictable and dynamic nature of ACT and the traffic density within the AIAA. It is therefore little surprise that London MILITARY were not able to offer greater assistance.

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 No3 F3 pilot for his laudably frank and honest account and understood why he would have been concerned at not being informed about the Firefly by ATC. The Mil ATC Ops advisor explained that CON14 had been assiduously providing traffic information about other traffic in the period before this Airprox had occurred and should have limited the RIS beforehand. No traffic information about the Firefly had been transmitted by CON14 to any of the F3 formation under the RIS, although it should have been; the omission contributed to the conflict and it was evident that the ATSU had broadcast this lesson widely. Thus the F3 pilots were unaware of the Firefly until the No3 pilot spotted the LA himself about 1000yd away [$\frac{1}{2}$ nm] and warned the rest of the formation about the impending confliction. Some military pilot members thought the congested airspace of the Lincolnshire AIAA was not the place to be conducting ACT at 540kt. The STC member explained that the formation had endeavoured to book a less congested area for this exercise, but none was available. With so much energy the F3 pilot was capable of avoiding anything once he had detected it, but members thought his speed was excessive. Each pilot was legitimately entitled to be operating where he was and notwithstanding the provision, or omission, of any

AIRPROX REPORT No 207/02.

traffic information here each pilot was ultimately responsible for detecting other ac and affording safe separation against them under the VFR. The STC fast jet member stressed that focusing 'on' the numbers in the F3's HUD and not looking 'through it' was poor technique and indicative of inexperience. The pilot should have been scanning for possible conflicts, as should the navigator with his AI radar, which was the only form of CWS available to them in the absence of a warning from ATC.

Other members were conscious that the Firefly was operating without the benefit of a radar service and wondered if that would have been of benefit here. Whilst understanding the workload placed on the QFI during the initial IF instructional sorties and notwithstanding the omission of traffic information to the F3 formation, some thought that a RIS could have given that vital 'heads-up' to the Firefly QFI about the three jets closing at high speed. One pilot member contended that conventional ATC frequencies are too congested and the RT too much of a distraction from the primary aim of teaching for a radar service to be mutually compatible with basic instruction. The provision of an ATS to training sorties was certainly a matter of local resources and priorities at the ATSU's concerned. But other units have learned this lesson and adopted this methodology - several ATSU's provide a dedicated control position with a dedicated RT frequency for the provision of a RIS to pilots conducting instrument training in AIAAs - perhaps that could have made a difference here. As it was both the Firefly student 'under the hood' in the RHS and his QFI were oblivious to the rapidly approaching No3 F3 and never saw it at all, only sighting one of the three jets - the No2 - as it cleared to starboard.

Members recognised that the Firefly QFI in the LHS was not positioned well to see or avoid a jet of small cross-sectional area approaching off the starboard wing at 540kt cross-cockpit with little relative movement to draw attention to it. Fortunately, the No3 F3 pilot saw the LA and managed to pitch up and turn away from it, thereby resolving this conflict in the AIAA, which the Board concluded had been the cause of the Airprox.

Turning to the assessment of risk, at these speeds the No3 F3 pilot had about 4sec to avoid the Firefly having seen it. The horizontal separation he had reported - 600ft/200yd, was a little less than that suggested by recorded data - about 260m, as both ac passed abeam each other, which convinced some members that safety had been compromised. The radar recording had not revealed the minimum vertical separation at the closest point, but the F3 pilot had reported it was about 600ft. However, the majority view was that the No3 F3 pilot's avoiding action was enough in the circumstances to remove any risk of a collision, without compromising the Firefly pilots' safety.

PART C: ASSESSMENT OF CAUSE AND RISK

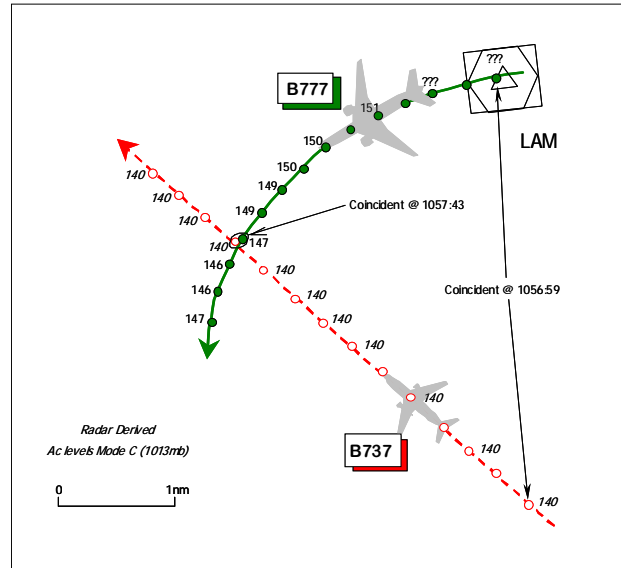
Cause: A conflict in the Lincolnshire AIAA resolved by the No3 F3 pilot.

Degree of Risk: C.

Contributory Factor: A lack of traffic information from London Mil CON14 to the No3 F3 about the Firefly, under the RIS that pertained.

AIRPROX REPORT NO 208/02

Date/Time: 22 Oct 1057
Position: 5137N 00005E (2.75nm SW Lambourne (LAM) VOR)
Airspace: London TMA (Class: A)
Reporting Aircraft Reported Aircraft
Type: B777 B737
Operator: CAT CAT
Alt/FL: ↓FL140 FL140
Weather NK NK
Visibility: NK NK
Reported Separation:
1nm H, 500ft V 600ft V
Recorded Separation:
Nil H, 600ft V

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

THE B777 PILOT reports that he was inbound to Heathrow from Dubai and was in contact with London Control on 121.22MHz. On entering the LAM hold at FL150 at 240kt, ATC instructed descent to FL140. Passing FL143, he thought, ATC transmitted “*Maintain FL150*”. So he initiated auto-regain of altitude and then disconnected A/P and began manual regain. TCAS RA “*Adjust vertical speed*” was given soon afterwards with an indication to increase vertical speed in the climb. FL150 was regained. Minimum separation distances from TCAS were 500ft V and 1nm H.

THE B737 PILOT reports that he was en route from Gatwick to Edinburgh, in contact with London on 127.95MHz, squawking 5060, maintaining FL140 at 285kt but awaiting further climb. TCAS RA “*Monitor vertical speed*” enunciated and he complied. He reported the incident to London Control who advised that an ac in the LAM hold had busted his level. The other ac had descended to a TCAS- indicated height difference of 600ft above.

THE TC NE DEPS/LAM SECTOR MENTOR reports that he was supervising a trainee under high traffic loading made more complicated because of weather avoidance and was in the process of splitting the sector. Traffic was holding at BRASO feeding LAM and it was agreed with TC

CAPITAL that the B737 could climb to FL140 to enable another ac to be dropped to FL130 in the LAM hold. He then became occupied in calling traffic on from BRASO. It was in this period that the trainee descended the B777 to FL140. At the time the B737’s label was overlapped by another. However, the TC N Co-ordinator OJTI pointed out the B737 and the NE DEPS/LAM trainee immediately instructed the B777 to maintain FL150; its Mode C was still showing FL150. But there was no response. So he, the mentor, instructed the B777 to maintain FL150 to which the pilot responded that he was “*maintaining 150*”. Mode C of the B777 was observed to descend to FL147 before climbing again to FL150. After the event he realised that he had not made it clear to his trainee why the Heathrow inbound had been descended to FL130 and the consequent position and level of the B737.

[UKAB Note: A report was also received from the TC NE DEPS/LAM trainee SC.]

THE OFFGOING LTCC CAPITAL SECTOR CONTROLLER reports that he had been relieved a few minutes earlier but had remained at the sector to assist with some co-ordination. To keep things moving in the Lambourne stack, the TC NE/LAM mentor verbally requested the CAPITAL SC to climb the B737 to FL140 to enable a Heathrow

AIRPROX REPORT No 208/02.

inbound, an A319, to descend to FL130. This was achieved but a subsequent inbound to LAM, the B777, was observed descending below FL150. STCA activated and NE DEPS/LAM advised that the B777 was climbing back to FL150.

THE TC CAPITAL SECTOR CONTROLLER reports that the B737 was routing through the LAM hold at FL130. Co-ordination was then agreed with NE DEPS/LAM mentor to climb the B737 to FL140. Following this the B777 was seen to be descending through FL150 to FL149. NE DEPS/LAM instructed the B777 to climb back up to FL150 but the B737 pilot reported that he had received a TCAS RA.

THE TC N CO-ORDINATOR reports that he was working as an OJTI with a trainee. He noticed that the B737 and the B777 would very shortly be in conflict and alerted the TC NE DEPS/LAM control team.

ATSI reports that at the time of the encounter, the B737 was under the control of the TC CAPITAL SC, whilst the B777 was under the control of the TC NE DEPS/LAM (TC NE) SC. A mentor and trainee were operating the TC NE position. Both the workload and traffic loading were reported by the mentor as 'high moderate', ie busier than moderate but not busy enough to be classified as high.

The mentor explained that he was one of 2 trainers for the subject trainee who had accumulated some 100 hr training. He was progressing well and, accordingly, was being permitted to operate with a moderately high degree of autonomy. However, the mentor remained plugged in and sat alongside at all times during the session.

The mentor and trainee had taken over TC NE approximately 10 min before the Airprox took place and 5 min beforehand several ac started to ask for weather avoidance. This, coupled with the continued need to utilise the BRASO hold, led the mentor to ask for the position to be split. The arrangements for this were being undertaken but had not been implemented by the time the Airprox occurred.

The B777 established communication with the TC NE SC, at 1053:50, and reported tracking to LAM at FL180. Descent clearances followed, first to

FL160 and then to FL150. The B737 had departed Gatwick following the LAM 4M SID. At 1055:00, the crew established contact with the TC CAPITAL SC and reported maintaining FL130, on a radar heading of 310°. At that time, the B737 was approximately 14nm S of the B777, on a converging track.

The mentor then called to the TC CAPITAL SC and agreed that the B737 could be climbed to FL140, to transit the LAM holding area; an A319 in the hold at FL140 was going to descend to FL130. The trainee duly instructed the A319 to descend in the LAM hold and, at 1055:30, the TC CAPITAL SC issued clearance for the B737 to climb to FL140. At this point the B777 was 11nm N of the B737 descending through FL175 for FL150. The mentor then became involved in co-ordinating the next inbound to leave BRASO for the LAM hold.

At 1057:20, the B777 reported entering the hold maintaining FL150. The trainee, aware that the ac below in the stack [the A319] was now maintaining FL130 and of the need to descend traffic in the hold as soon as practicable, instructed the B777 to descend to FL140. The mentor, engaged in co-ordinating traffic at BRASO, did not hear the trainee issue this descent instruction. Although the mentor had co-ordinated the B737 to cross the hold at FL140, this had not registered with the trainee and the mentor recalled that, around the time the descent clearance to the B777 was issued, the SSR label of the B737 was overlapping that of another ac. The TC N Co-ordinator, who was nearby, heard the trainee's transmission to the B777 and immediately pointed out the B737 at FL140. The trainee transmitted "C/s *maintain FL150*", [UKAB Note: Inadvertently using an incorrect flt no] to which there was no reply. The mentor then immediately transmitted "C/s *maintain FL150*" [UKAB Note: Using the correct c/s] to which the pilot replied "C/s 150". STCA did not flash 'white' but went straight to 'red' as the 2 ac passed with a Mode C difference of 600ft.

The crew of the B777 climbed back to FL150 and reported level. Meanwhile, the crew of the B737 reported to the TC CAPITAL SC that they had received a "TCAS contact" on an ac, which descended to 700ft above them before climbing again. After landing the crew of the B777 filed an Airprox report.

The mentor had assessed that when he took over TC NE, although the situation was busy and quite complex, this would decline shortly. This was his reason for accepting the position in the bandboxed mode rather than requesting the position being split into its component parts. Traffic was being held at BRASO as well as LAM but he expected that as the traffic declined, the need to hold at BRASO would cease. He would not have accepted the bandboxed position with a trainee, had it been expected that traffic levels and the complexity of the situation would increase.

The standing agreement for Gatwick departures routeing via TC NE airspace is to be level FL130 by the TMA N/S boundary, a line drawn between Heathrow and TANET (near the Isle of Sheppey). Such traffic must be positioned west of the DET – LAM track and analysis of the radar confirms that this was achieved. The mentor reported that although the normal procedure was to ‘sterilise’ FL130 at LAM for these flights, it was common practice, occurring perhaps 10 times a day, for a higher level to be coordinated with the TC CAPITAL sector. A LAM strip is produced for such flights but it is understood that a large proportion of controllers, including the mentor, do not use them. Instead, he preferred to rely on remembering the new co-ordinated level during the short period that such ac would be traffic to ac in the LAM stack. Use of the FPS in this case may have alerted the trainee to the situation and it would seem appropriate to have used it, particularly as the ac was transiting the holding area at a ‘non-standard’ level. Accordingly, the following proposal is made:

‘It is recommended that LTCC management consider mandating the use of LAM FPS when traffic is co-ordinated to transit the LAM holding area at a ‘non-standard’ level’.

BRASO is an ‘outer hold’ feeding LAM and so there is implicit pressure on controllers to keep traffic descending in the LAM hold, so that time spent holding at BRASO and, when that is full, LOGAN is kept to a minimum. Furthermore, traffic leaving BRASO is invariably quite high which makes vectoring for Heathrow more complex if descent clearances are not issued promptly. It was for these reasons that the mentor was actively engaged in co-ordinating directly with TC E to move traffic promptly from BRASO to LAM.

The mentor, in a full and frank account of the Airprox, advised that, whilst he had the whole plan in his mind, he had not shared it with his trainee. He reported that he believed that he had explained the situation to the trainee but could not be certain. The trainee was concentrating on descending traffic in the LAM hold and so when the B777 reported entering the hold, as he could see that the A319 ahead had left FL140, he cleared the B777 down to that level. The TC N Co-ordinator is to be commended for alerting the mentor and trainee to the error. His prompt action led the trainee to cancel the descent instruction, but he inadvertently used the wrong c/s. The mentor then repeated the instruction, but without saying “avoiding action” as, at the time he transmitted, the Mode C of the B777 still indicated FL150. Analysis of the radar shows that the B777 subsequently passed virtually overhead the B737, 600ft above it before climbing back to FL150.

Following the Airprox, both crews submitted written reports in which they report receiving TCAS RAs. However, neither crew advised ATC who remained unaware of the actions being followed by the crews to resolve the confliction.

UKAB Note (1): Subsequent to the incident LTCC management issued OPNOT 02/03, which states:

“Following a recent incident involving a Gatwick LAM departure transiting the LAM Holding Area, controllers are reminded of the requirement to correctly annotate Flight Progress Strips. As detailed in the TC MATS Part 2 GEN 9.4.1 the responsibilities of a TC Sector Radar Controller with respect to Flight Progress Strips are as follows:

Maintain an up-to-date flight progress display by ensuring that the Flight Progress Strip data remains consistent with the instructions issued, communications received and by using radar derived information when appropriate.

Additionally the TC Co-ordinator (GEN 9.5.1) has the following responsibility:

Maintain an up-to-date flight progress display by annotating the appropriate Flight Progress Strips with the co-ordination effected including departure, joining and crossing clearances. As a specific example Gatwick LAM departures transiting the LAM Holding Area should be

AIRPROX REPORT No 208/02.

correctly annotated, including any subsequent co-ordination effected by TC South and/or TC Capital, and be correctly displayed in the appropriate flight progress display."

UKAB Note (2): Analysis of the Heathrow (23cm) radar data recording shows the B777, squawking A6650, crossing LAM at 1056:59, but Mode C is unreadable because of label overlap with another contact, the A319. The B737, squawking A5060 indicating FL140 Mode C, is 3.7nm to the S tracking NW. Tracks converge as the B777 enters holding and at 1057:43, radar shows respective contacts touching as the B777, indicating FL147 Mode C, passes 700ft above and just behind the B737, which displays 140 Mode C. Minimum recorded vertical separation was 600ft shown on the next 2 successive sweeps, before the B777 climbed back to FL150.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The debate opened with a discussion about the TCAS RAs received by both crews. A CAT pilot member explained that the "MONITOR VERTICAL SPEED" RA enunciated to the B737 crew here was essentially 'passive' in nature and, depending on the airline's SOPs, might not even require the pilot to disengage the autopilot. It was effectively advice to the pilot not to alter anything and all would be well and the designed separation parameters achieved. Whereas the more imperative RA commands of "DESCEND" or "CLIMB" would more commonly require the autopilot to be disengaged.

The Board noted that this Airprox had occurred whilst the NE DEPS/LAM control team were operating a bandboxed sector and whilst both the SC and N CO-ORDINATOR were instructing their respective trainees. Though the SC had already initiated a sector split, it appeared that the NE DEPS/LAM SC mentor had taken over the bandboxed sector anticipating that the traffic loading would either remain steady, or, possibly decrease. However, subsequent weather

avoidance requests kept the workload up and undoubtedly placed an increased strain on the trainee. Members thought it might have been preferable to have delayed allowing the trainee to 'take the reins' until after the sector had been split or, alternatively, the SC mentor could have worked the traffic himself until the split had been successfully accomplished. As it was, it seemed that the high work rate required was more than the trainee could handle and the mentor was carrying out some of the sector tasks himself rather than monitoring fully what his trainee was doing. Indeed the mentor was carrying out co-ordination at the critical moment when his trainee initiated the B777's descent, and some wondered if this task should not have been executed by the CO-ORDINATOR. Many saw this divided attention to workload as evidence that the bandboxed sector was too busy, but those members intimately familiar with the TC operation thought that the mentor was just trying his best to speed things along and ease the load on his trainee prior to the split being completed. Members concluded, however, that there had been too much to do; by taking over part of the sector and, in effect bypassing his trainee, the SC mentor had not exercised sufficient supervision over his trainee. A further point of concern was an omission by the mentor who had not ensured a FPS was in place for the B737 transiting through the LAM stack. The Board concurred with the ATSI recommendation and noted the content of the Unit's OPNOT 02/03, but many controller members thought there was little room for debate on this issue and considered that there had always been a requirement for an applicable 'strip'. Since an FPS was an essential aid for operation of the sector the trainee should have been taught to use one as a matter of course and, in the Board's view, the mentor was remiss in not ensuring that his trainee was following 'standard' practice. The Board considered this example of poor training technique should encourage the unit management to be more insistent on standard operating procedures being taught; standardisation, especially amongst mentors, was thought essential if trainees were to progress effectively through the 'training pipeline'.

The Board commended the NE DEPS/LAM SC for his frank and honest report and recognised his motivation in effecting co-ordination with the CAPITAL SC himself, thereby allowing the B737 to transit the vicinity of the LAM stack. It was

explained that 'northbounds' departing from Gatwick are very commonly encountered on the sector but not usually straight through the stack (normally they are vectored W of the hold). The SC mentor's plan had been sound, but crucially, he had not conveyed it to his trainee. Undetected by his mentor who had become embroiled in another part of the bandboxed sector calling traffic on from BRASO, the trainee had instructed the B777 crew to descend to the level occupied by the transiting B737. The Board echoed ATSI's endorsement of the alert N CO-ORDINATOR'S actions, as it was he who first realised there was a conflict and stepped in effectively, prompting the NE DEPS/LAM trainee controller to transmit an instruction to the B777 crew to maintain FL150. Erroneous use of the wrong callsign, delayed matters slightly before the mentor took positive action himself to arrest the B777's descent. In identifying the fundamental cause, lack of communication between mentor and trainee was a factor prompted by the unexpected workload and the mentor's response to that situation. Other actions could have been taken that preserved the mentor's prime responsibility of knowing what was happening on his sector. This led the Board to

conclude that this Airprox had resulted because the NE DEPS/LAM SC mentor had, by default, allowed his trainee to descend the B777 into conflict with the B737. Nevertheless, the conflict was recognised in time for corrective action to be taken. Though standard separation minima had been eroded down to 600ft, the combined effect of the NE DEPS/LAM SC's instruction to maintain FL150 and the B777 and B737 crews' compliance with their respective TCAS RAs had demonstrated that appropriate safety nets had played their part in preventing these ac from getting any closer. The Board agreed unanimously that no risk of a collision had existed in the circumstances reported here.

PART C: ASSESSMENT OF CAUSE AND RISK

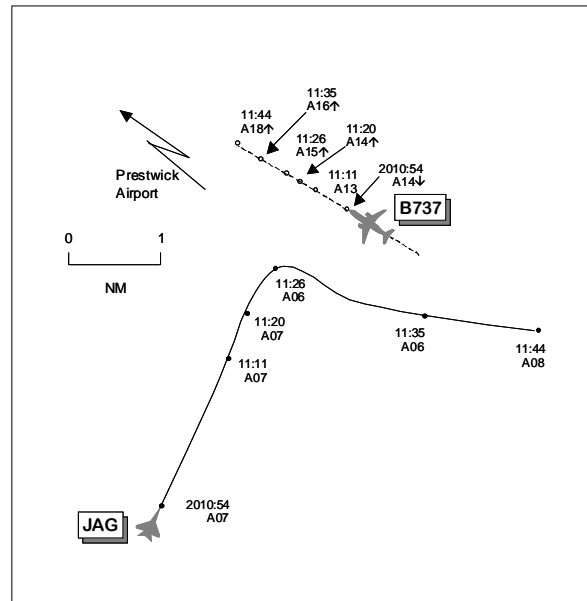
Cause: The NE DEPS/LAM SC mentor allowed his trainee to descend the B777 into conflict with the B737.

Degree of Risk: C.

AIRPROX REPORT No 209/02.

AIRPROX REPORT NO 209/02

Date/Time: 22 Oct 2011 NIGHT
Position: 5527N 0430W (3nm SE Prestwick - elev 65ft)
Airspace: FIR (Class: G)
Reporter: Prestwick APR
First Aircraft Second Aircraft
Type: Jaguar B737-800
Operator: HQ STC CAT
Alt/FL: 300ft NK
(Rad Alt)
Weather VMC CLOC VMC CAVOK
Visibility: >10km >10km
Reported Separation:
800ft V 1nm H not seen
Recorded Separation:
900ft V 1.1nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE PRESTWICK RADAR CONTROLLER reports that the B737 was on final approach for RW31 when two 7001 squawks were seen 10nm S of Prestwick; these contacts were passed as TI to the B737. When at 6.5nm range, one of the unknown ac turned away to the SE, whilst the second continued towards the airfield at high speed. An avoiding action climb to 6000ft was passed to the B737 when it was at a reported 3nm range on final approach descending through 1600ft. The unknown ac passed 0.5nm behind the B737, (which was by now at range 2.5nm), indicating 800ft, before continuing to track away from the airfield along the final approach track. The Prestwick 2020Z METAR shows 32014KT 9999 FEW045 06/04 Q985.

THE JAGUAR PILOT reports that he was number 2 of a pair of Jaguars operating at about 300ft agl in the UK Night Low Flying System, using Night Vision Goggles (NVGs). As the pair approached a planned turning point heading 020° about 9nm S of Prestwick, he was flying in the leader's 7 o'clock position at about 1.5nm range. At the turning point, the lead ac appeared to maintain a track which would cross Prestwick's extended C/L at about 5nm range, and the pilot believed that this was to avoid poor weather on the high ground to the E. No traffic was seen ahead which would be

affected by this track. When he was about 3nm S of the approach path to RW31, the pilot became aware that he was suffering from a visual illusion, and that the lights he thought belonged to his leader's ac were in fact those of an ac on final approach to Prestwick. As soon as the error was realised, he turned away to the E, passing about 1nm S of the other ac and "well below". There was thought to be no risk of a collision, and the pilot was sure that he had remained both within in the Low Flying System airspace, and clear of the Prestwick ATZ.

The pilot noted that, as the pair were flying towards lower ground as they approached the turning point, the lead ac's lights would have merged with background lighting. He believed that the lead ac may have turned whilst he was looking elsewhere as part of his normal scan, and that on looking back towards the leader, his attention fell on the lights of the B737 which would have been situated in the same field of view as his leader had moments before. It had not been possible to detect the error at that stage because of the distances involved.

THE B737 PILOT reports that he was on final approach to Prestwick displaying 'full lighting' in good weather conditions. The conflicting ac was

not seen visually and no TCAS indications were received. The Prestwick controller ordered the climb to 6000ft, and this was complied with, using standard operating procedures.

ATSI comments that the APR had limited the RAS being provided to the B737 owing to a windfarm and had warned of the possibility of late traffic warning from below for the next 6 miles. Some three and a half min later, TI had been passed, well after the radar limitation area specified, on the Jaguar ac. It is understandable that the APR allowed the B737 to continue its approach for as long as possible, as it appears the radar contacts would pass behind, before issuing a prewarned 'avoiding action' instruction to climb to 6000ft.

THE JAGUAR PILOT'S UNIT reports that, despite mis-identification of his formation leader, the Jaguar pilot was aware of his location and proximity to Prestwick. He was operating in Class G airspace within the bounds of the UKNLFS and remained clear of the Prestwick ATZ and approach lane. The size of the ATZ (2.5nm rad) increases the likelihood of an Airprox being filed with a TCAS equipped ac on its approach to the aerodrome.

HQ STC comments that the full and honest report of the Jaguar pilot explains how the lights of the B737 at 6.5nms, replaced those of the lead Jaguar at 1.5nms within his scan. This incident serves to highlight the risks of visual illusion during night flying, and will be publicised widely in the RAF, including at the NVG initial training course at the RAF Centre of Aviation Medicine.

UKAB Note: Analysis of photographs taken from the Lowther Hill recorded radar clearly shows the incident per se but without any geographical reference. At 2010:54 a 7001 squawk, believed to be the subject Jaguar, is seen tracking 025° indicating 700ft QNH Mode C with the B737 in his 1230 position range 4nm indicating 1400ft QNH Mode C tracking 300°. Both ac continue on steady tracks, the next photograph at 2011:11 shows the B737 crossing through the Jaguar's 12 o'clock range 2.2nm indicating 1300ft QNH, 600ft above it. By 2011:20 the B737 is indicating 1400ft QNH climbing, 1.7nm ahead of and just to the L of the Jaguar's projected track. Simultaneously, another 7001 squawk appears 4.5nm SE of the Jaguar, believed to be the formation leader, tracking 060° indicating 1200ft QNH. The CPA occurs 6

sec later at 2011:26, the B737 now 1.1nm to the N of the Jaguar climbing through 1500ft QNH, 900ft above the Jaguar which is now indicating 600ft QNH. The next radar sweep shows the Jaguar now tracking 100° and diverging, having turned sharply away towards the other Jaguar.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The ATSI advisor informed members that there had been additional military low flying activity in the 10-15min period prior to the Airprox close to Prestwick's RW31 final approach area. The Prestwick APR had forewarned the B737 crew well in advance of this, telling them that in the event of any traffic conflicts on their approach, a climb to 6000ft would be required as 'avoiding action'. Members commended the Jaguar pilot's honest report describing the 'visual illusion' that he had suffered. He had been caught out when his leader's lights had merged into background lighting on the ground near the pre-planned turning point and members understood, with sympathy, what happened after that. The discussion touched briefly on the 'full lighting' displayed by the B737 as this can differ between ac of the same type within different airline fleets and can include any, or all of, forward facing landing lights, white HISLs as well as tail-fin illumination floodlights. Nevertheless, on this occasion, whilst flying on NVGs, the Jaguar pilot had misidentified the B737 as his leader's ac, and this had caused the Airprox.

ATCOs commended the APR's 'avoiding action' instructions given to the B737, particularly as the conflicting traffic's intentions were not known and it was approaching at high speed, which left only a resolution in the vertical plane as the most suitable option. The Jaguar was unsighted to the B737 crew throughout, and they had complied with the ATC instruction; no TCAS alerts were received. However, the APR was not aware that the Jaguar pilot had erroneously 'locked' his visual attention onto the B737 in the belief that it was his leader, whilst being fully aware of his geographical

AIRPROX REPORT No 210/02.

position; after realising his error, the Jaguar pilot had turned his ac sharply away to the E, passing 1nm clear and well below. These elements led the Board to conclude that the subject ac were never going to collide and that safety had been assured throughout the encounter.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: While using NVGs, the Jaguar pilot misidentified the B737 as his leader.

Degree of Risk: C

AIRPROX REPORT NO 210/02

Date/Time: 23 Oct 1424

Position: 5304N 0135E (23nm NNE of Coltishall)

Airspace: Wash ATA (Class: G)

Reporting Aircraft **Reported Aircraft**

Type: Tornado F3 Jaguar GR3A

Operator: HQ STC HQ STC

Alt/FL: 18000ft FL200

(RPS 988mb)

Weather VMC CLOC VMC No cloud

Visibility: Excellent 10km+

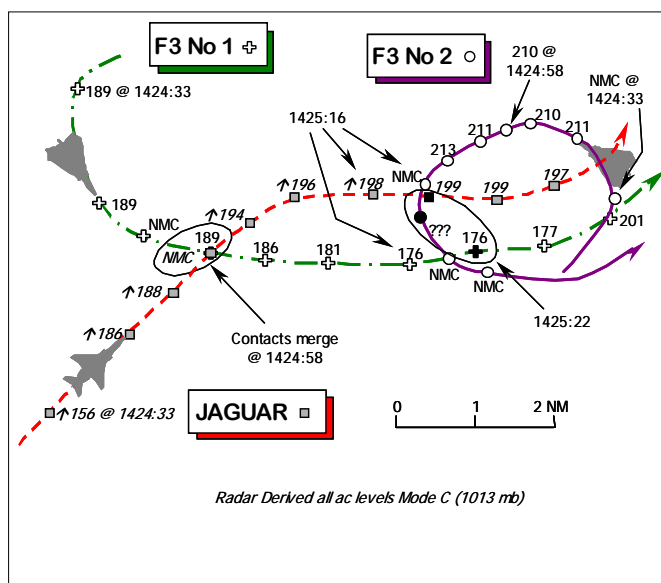
Reported Separation:

50ft H, 50ft V 200m H

Recorded Separation:

F3No1/Jag: contacts merged

F3No2/Jag: < 0.32nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE TORNADO F3 PILOT reports he was the No1 of a pair of F3s conducting a 2v1 air combat training (ACT) sortie against some other F3s as part of the Operational Conversion Unit (OCU) syllabus. His ac is camouflage grey, but the HISL was on. As a result of radar equipment difficulties CRC Buchan could only provide a FIS; a squawk of A1531 was selected with Mode C, but neither TCAS nor any other form of CWS is fitted.

They had set up a combat air patrol (CAP) at 450kt about 20nm N of Coltishall. He was aware of several 'strangers' in the area including some Jaguars working either London (Mil) or Coltishall as prior to the Airprox a practice interception (PI) had to be terminated because of another Jaguar in the vicinity of the merge area. Co-ordination

with this traffic had been requested through Buchan, but this could not be achieved.

About 20sec before the Airprox, he was turning L through S to reposition on CAP at 18000ft RPS (988mb) when Buchan called - "traffic south 5nm, heading north east, climbing through FL175". Fifteen sec later, as he rolled out onto a heading of 110° his navigator called "break left"; he bunted the ac slightly as he saw the shadow of a Jaguar pass about 50ft above and 50ft ahead of his ac crossing from R-L. The Jaguar pilot then appeared to pull up and passed within ½nm of his No2, but did not appear to have seen either Tornado. Only instinctive avoiding action was taken as the other ac was seen too late to react in time; he reported that the other ac had been spotted about 2000ft away by the navigator and

that the risk had been "very high". He added that despite AI radar, GCI and visual lookout they came very close to a collision.

THE JAGUAR PILOT reports that his ac has a grey camouflage scheme, but the HISL was on whilst operating VFR in the Wash ATA, positioning for some general handling. He was receiving a FIS, he thought, from Coltishall who warned him about other ac operating in his vicinity. Shortly afterwards whilst flying eastbound at 450kt, straight and level at FL200, an F3 appeared from behind his ac at a range of 200m passing to starboard in, he thought, a left hand descending turn, closely followed by another F3 following a similar flightpath. No avoiding action was taken and he thought that the F3s had crossed his flightpath about 200m behind his jet at the same level.

UKAB Note (1): The Coltishall RT/landline transcript timings differ by about 1½min from the radar recording, which is accurate. Therefore, the timings within the Mil ATC Ops report have been corrected to compensate for this inaccuracy.

MIL ATC OPS reports that the Jaguar pilot free-called Coltishall ZONE returning from Donna Nook range for some general handling before recovery at Coltishall. At 1421:04, the pilot was instructed to "...manoeuvre as required FL50 FL200 squawk 1757 and report 1 minute to recovery" and the type of ATS he required established. At 1421:39, the Jaguar was identified and placed under a RIS. Traffic information was passed at 1424:34, on an ac observed "...northwest 3 miles, manoeuvring on a southerly heading, indicating 1000ft above" [the No1] and again at 1425:03, "...further traffic northeast 4 miles, tracking southwest indicating FL210 climbing" [the No2]. Both these calls were acknowledged by the Jaguar pilot, who reported "...ready for recovery" at 1429:42.

The Coltishall ATC SUPERVISOR (SUP) reports that ZONE was fairly busy working ac on 2 frequencies but that he was satisfied that it was comfortably within the controller's abilities. SUP also states that he was generally answering the landline to prevent ZONE from being bothered unnecessarily. Consequently, relevant landline conversations were between a CRC Buchan Assistant (AST) and the SUP.

Prior to this Airprox the AST had been liaising with SUP over another Jaguar manoeuvring in the area and SUP was also advised of 3 F3s "...in the Wash ATA sea level to 23K air combat". SUP enquired "...which sort of area in the Wash? OK I can see them, but which area are you talking about you want clear". However, as Buchan were "...using the whole area for air combat" SUP was unable to help, but volunteered "...if you were using one side of it we'd get him to move out of the way but if you're using the whole lot there's not a lot we can do". At this point (about 1409:25), AST advised "we'll call back for co-ordination" and the conversation ended. Later at 1421:38, Buchan Assistant 3 (AST3) called for information "...on a 1747 squawk..", as this code is not assigned individually but used for conspicuity SUP requested "...which one? position please?". However, the reply was somewhat vague, "oh in the wash ATA, where [F3 C/S] are working" consequently SUP advised that he could not "...see a 1747 at the moment can you call me back when you've got a position". At 1423:13, Buchan again called for "information on a 1732 please", however the caller did not identify himself. SUP responded "1732. It's a um...a Jaguar he's inbound for recovery now descending 1500ft radar information" and the caller rang off. A little later at 1424:32, AST Buchan 3 called about this ac and another "...near him...a 1757 can you give me information on him". SUP confirmed that this ac was "...manoeuvring [FL] 50 to [FL] 200.....radar information"; this information appears to have been trickle fed by AST Buchan 3 to the WC along with the ac type and the nature of his flight and at 1424:26 the call ended. However, the CRC Buchan FIGHTER ALLOCATOR (FA) called at 1425:41, advising "...we're working the 1531 - 32 - 33 squawks in the Wash ATA...one of them...he's just called an Airprox with your Jaguar. I think it's the 1757 squawk".

Analysis of the Debden radar recording shows the Jaguar approaching Coltishall from the NW having departed Donna Nook range. The Jaguar closes to 15nm N of Coltishall before turning to the NE. CRC Buchan's traffic, squawking A1531 and 1532, are 12 & 14nm respectively NNW of Coltishall, outside the Wash ATA, having completed a L turn onto a NE'ly heading which takes them back inside the eastern edge of the area. When these contacts are called by ZONE to the Jaguar pilot,

AIRPROX REPORT No 210/02.

the first is actually to the N rather than the NW, otherwise the traffic information provided was reasonably accurate. Thereafter, the Jaguar is masked by a mêlée of contacts & squawks.

An Aerial Tactics Area (ATA) is defined as "...airspace of defined dimensions designated for air combat training within which high energy manoeuvres are regularly practised by aircraft formations". The UK MIL AIP, at ENR 5-4.2 advises that "...non-participating aircraft who are unable to avoid these areas are strongly advised to make use of a radar service". JSP 318A 235.115, extant at the time but now superseded by MARDS, sets out the rules applicable to RIS and it is apparent that, in a rapidly changing scenario, ZONE passed adequate and reasonably accurate traffic information to the Jaguar pilot. At no stage was 'co-ordination' requested by Buchan; at one point Coltishall SUP tried to assist, but was unable to do so because of the restrictive and excessive amount of airspace requested by CRC Buchan. There are no contributory military ATC factors apparent within this Airprox.

UKAB Note (2): The Debden radar recording shows the Airprox broadly as reported by the No1 F3 pilot; The No1 F3 and Jaguar contacts merge at 1424:58, with no discernible horizontal separation; the minimum vertical separation cannot be determined at this point as the Jaguar's Mode C is not evident and only the No1 F3 indicated FL189. It would appear from the geometry of the encounter reported by the Jaguar pilot that he did not see the No1 F3 at this stage. The Jaguar pilot appears to have seen the encounter about 20 sec later as he turned onto E and levelled at about FL199. At 1425:22, the No1 F3 is shown overhauling the Jaguar displaced about 0.8nm to the S, albeit 2300ft below it, before climbing to FL201. Meanwhile, the No2 F3's track has passed close astern of the Jaguar - in a L turn to follow the No1 to the E; unfortunately the No2's Mode C is not evident at all after the tracks have crossed. At the next radar return the horizontal separation is 0.32nm suggesting that the minimum horizontal separation was significantly less than this distance.

AIR SURVEILLANCE & CONTROL SYSTEMS SAFETY & STANDARDS UNIT (ASACS SSU) reports that the F3 pair was operating in ADS4/Wash ATA carrying out a 2 v 1 sortie and only

receiving a FIS due to local equipment unserviceabilities at CRC Buchan. Under the terms of the FIS, safe separation from other ac was the responsibility of the crews. The Airprox occurred some 34min into the sortie; the airspace in the vicinity was busy in the period leading up to the incident. Indeed, some 4min prior to the incident the weapons controller (WC) called a 'knock-it-off' (KIO) for safety reasons as a stranger was approaching the merge at a similar level.

The WC fulfilled his obligations under the FIS. Traffic information was passed to the No1 F3 on the Jaguar at 1424:29, "[C/S] 1 you have one stranger...south 5 miles heads north east climbing through flight level 175'. The Jaguar is called again at 1424:50, "[C/S] 1 you have one stranger your nose 1 mile heads north east climbing through 19000ft". With the high cockpit workload in the No1 F3 the significance of these calls may have been missed. The radar recording shows that unless the Jaguar was acquired visually on the initial call, the No1 would have been 'belly-up' for the latter stages of 'the merge' and thus probably unsuspected.

However, the Buchan investigation report and RT transcripts show that there might have been other factors that affected the situation. The WC concerned was undergoing a Certificate of Qualification (CQ) check whilst controlling this sortie and this may have delayed intervention by the FA and controller screening him. This is a well documented phenomenon in both the pilot and controller training/examination domains, when the desire to allow the individual to solve the problem leads to a late intervention. The decision by the WC to allow his assistant to carry out the external liaison may have been due to the pressures imposed by his CQ check, as WCs do not normally delegate this function. This lack of experience would normally be ameliorated by the supervising WC or the FA, indeed the FA had already spoken to the WC about the previous KIO and indicated that although it was the right decision it was given only just in time. Although the WC did fulfil his obligations under the terms of the FIS, his lack of experience was a factor. The lessons learnt about external liaison and the tasks that might be set WC's assistants, will be addressed during the next ASSU 'Roadshow' to ASACS units. Additionally, the problem of the supervision of personnel undergoing checks and the late intervention issue will also be included.

THE TORNADO F3 PILOTS' STATION COMMENTS that this was a standard OCU syllabus sortie in the local training area just N of E Anglia. The No1 F3 was crewed by a student pilot and a staff navigator instructor. They had tried, unsuccessfully, to obtain a RIS from the CRC and to deconflict known Jaguar traffic. Just before the incident, they were in a long left hand turn to the E, effectively turning into the traffic 'belly-up' when they were informed of traffic at 5nm climbing towards their level. Consequently they had no radar contact and the navigator acquired the Jaguar visually immediately on roll out 10-15 seconds after the call. Although the pilot took instinctive action, it is unlikely the flight path of the F3 was changed significantly. The crew was so shaken by the incident that they terminated the exercise and immediately recovered to base. They had been aware of the traffic density and reduced GCI service and consequently the need to maintain a good lookout; the crew's workload at the time of the incident was assessed as low. The incident appears to have resulted from a late call as a result of the GCI radar problems and the apparent lack of awareness by the Jaguar pilot of the presence of the F3 pair.

THE JAGUAR PILOT'S STATION comments that with only one side of the story it is difficult to add any value to what prima facie seems to be a case of poor lookout.

HQ STC comments that ultimately this Airprox resulted from a failure of lookout in class G airspace by the aircrews involved, but there are other factors that cause considerable concern to this Command. Here this entirely avoidable Airprox also stemmed from the inability of the ASACS and ATC agencies to co-operate and co-ordinate, and of the F3 crew to assimilate and act upon the ASACS traffic warning. During the landline conversations between the Coltishall ATC SUPERVISOR and the CRC Buchan Assistant reported by Mil ATC Ops, the inability to achieve any form of agreement was largely due to the naïve attitude of the AST. However, the AST was working under the supervision of a WC [undergoing a CQ check], the checking WC and a FA, neither of whom intervened to check what the AST was doing or to ensure that co-ordination was effected with other controlling agencies. At 1423:09, the WC advised the F3s "...we are unable to get any co-ordination from other agencies to move out of the way...", which was only correct

insofar as neither of the controllers involved had attempted to co-ordinate with Coltishall ATC, merely leaving it to the AST; we note that the ASACS SSU will review the training, tasking, and duties of Assistants and Supervisors. Whilst the frustration of the Coltishall ATC SUPERVISOR is understandable, with hindsight it would have been desirable if she had insisted on speaking to a controller or 'supervisor' after the dialogue with the AST had not generated positive action. The WC had informed the F3s that the southern part of the ATA was 'quite busy', but the F3s appeared reluctant to relocate their activity to another piece of the sky. The ASACS SSU report has revealed that the WC passed traffic warnings about the Jaguar to the No1, 25sec before and 5sec before the Airprox. However, the No1 maintained a long 'belly-up' left hand repositioning turn that negated any chance for him to gain an early sighting of the reported Jaguar. This was poor airmanship and not in accordance with the basic training RAF pilots receive to always clear their flightpath.

The issue of how to better share the Wash ATA airspace has in part been obviated by recent changes to the airspace structure in this vicinity and the rebasing of some flying units. However, the inability of the ATC and ASACS units to achieve an accord during liaison is disappointing, as is the reluctance of the aircrew involved to 'give way' to each other. There is an apparent need for better teamwork across all agencies and a need to realise that airspace is a finite resource that must be shared; this must be done through a more co-operative attitude by all concerned. This Airprox highlights a critical need to revive and extend CRM/TRM/HRM training to all personnel involved in aviation. STC Flight Safety are initiating a programme to develop this training for the RAF as a whole.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available to the UKAB 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.

Though the F3 formation had been placed under a FIS, effectively, the WC had provided a RIS.

AIRPROX REPORT No 210/02.

Traffic information had been passed about the Jaguar as it climbed toward the lead F3, some 5nm away and about 1500ft below. This information appears to have been transmitted when the No1 F3 was turning L through SW; radar recording timings are accurate, unlike the accuracy of some military RT recordings which means correlation of an RT transcript with a radar recording is not always as clear-cut as it should be. Nevertheless, the traffic information provided was adequate, but the point at which it was probably transmitted did not permit early visual acquisition. The No1 F3 crew would have been 'belly-up' to the Jaguar in the turn and thus unsighted until they rolled out eastbound. That said, the fighter's crew had not done anything positive themselves with that information to avert the conflict. Instead of rolling out momentarily to look for the approaching Jaguar they maintained their turn and the navigator probably saw the Jaguar as early as he could, once the turn was complete. Some members queried if the No2 crew had any responsibility for lookout here. The STC member thought not, although they should have had a better view of the Jaguar climbing up toward him; he also remarked that it was the No2 crew that had called the No1 to reposition on their ac.

The Jaguar pilot had also been warned of the presence of the No1 F3 and separately about the No2. Though some members thought this information was given somewhat late, it should have painted a sufficiently clear picture to enable the Jaguar pilot to spot the No1 F3 closing from the port side, slightly above him, although the pale 'belly-up' aspect against a pale sky may have made this difficult. In the end the Jaguar pilot did not see the No1 (to his left as it underflew his ac) until it appeared on the starboard side after their flightpaths had crossed. This cross was followed shortly afterwards by a similar crossing by the No2. Although the Jaguar pilot had reported this second encounter, it was the first one where he had been unsighted that had been the reason for this Airprox report and the encounter upon which the Board based its assessment. Therefore, the Jaguar had also knowingly continued his climb toward the two jets that he had been warned were in close proximity but did not see until they later

passed clear to starboard. The Board considered whether this was reasonable in these circumstances; the prevailing view was that each ac should have been visible to each of the pilots involved. Though traffic information had been provided to assist detection, it counted for naught and the Board agreed that the cause of this Airprox was a non-sighting by the Jaguar pilot and a very late sighting by the No1 Tornado F3 pilot.

Turning to the risk inherent in this encounter members considered whether the reporting No1 F3 pilot's avoiding action - "he bunted the ac slightly" - materially altered the outcome. The consensus was that it probably did not change the Tornado's flightpath very much before they crossed. Although the radar recording did not reflect the Mode C levels at the critical moment, interpolation of the Jaguar's indicated level before and after the occurrence at 1424:58, gave credence to the F3 pilot's assertion of 50ft vertical separation and it was probably little more than 100ft when the contacts merged. As the Jaguar pilot was unsighted at this stage he was unable to effect the outcome and could not have given the fighter a wider berth. The Board concluded that in the circumstances reported here an actual risk of a collision had existed.

The issue of co-ordination between the respective CRC and ATSU was discussed. It was evident to the Board and reaffirmed by the respective specialist advisors, that a controller's assistant - whether of the ATC or Air Defence specialisation - could not initiate or complete co-ordination as this authority was vested solely with the controller. HQ STC's concerns regarding this matter were well made and the Board welcomed the proactive initiative to expand CRM training in this sphere.

PART C: ASSESSMENT OF CAUSE AND RISK

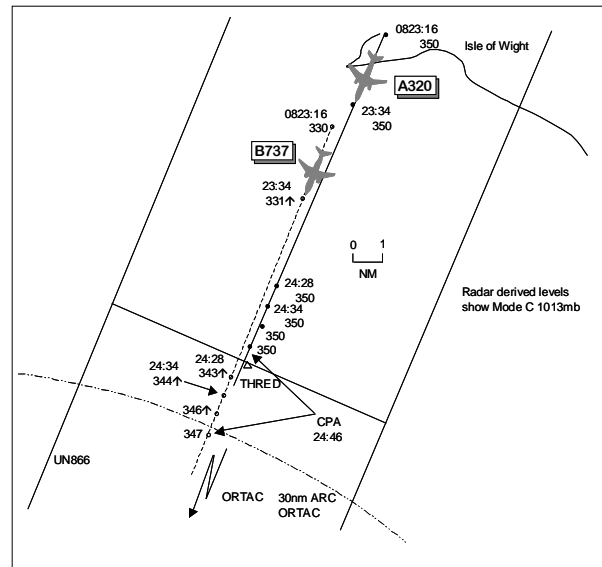
Cause: Despite traffic information passed to both pilots, a non-sighting by the Jaguar pilot and a very late sighting by the No1 Tornado F3 pilot.

Degree of Risk: A.

AIRPROX REPORT NO 211/02

Date/Time: 26 Oct 0825 (Saturday)
Position: 5028N 0141W (31nm NNE ORTAC)
Airspace: UAR UN866 (Class: B)
Reporting Aircraft Reported Aircraft
Type: B737-700 A320
Operator: CAT CAT
Alt/FL: FL345↑ FL350

Weather VMC CLOC NK
Visibility: Unltd NK
Reported Separation:
400ft V 3nm H NK
Recorded Separation:
300ft V 3.3nm H

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

THE B737 PILOT reports heading 220° cruising at FL330 and M0.75 en route from Luton to Malaga and receiving an ATS from London. After transfer to Brest Control, he was given climb clearance to FL390 but when climbing through FL345 he was told to level at FL340 and then to “return to FL340”. He disconnected the A/P and descended back down to FL340. Subsequently he was informed that there had been another ac 3nm behind, the subject A320, at FL350 which London had not informed the Brest controller about. No TCAS alerts were received during the encounter and he assessed the risk of collision as medium.

THE A320 OPERATOR was contacted post incident but no report was received.

LACC ATS INVESTIGATIONS reports that the incident occurred 31.5nm NE of ORTAC. The B737 was climbed progressively to FL330 and when clear of Sector traffic it was released on its own navigation to ORTAC. When the B737 crew asked for climb to FL390, they were instructed to maintain FL330 and to request the higher level from Brest Control on channel 132.765 MHz, leaving the frequency at 0822:36. The A320 had called on frequency cruising at FL350 routeing to ORTAC and it was transferred to Brest Control on channel 132.510MHz at 0823:43. However the A320 went to a wrong frequency and returned to

the S20 frequency at 0825:42; it was then transferred to the correct Brest channel at 0826:13. Replay of the Swanwick Flight Data Base shows that an ACT message for the A320 at FL350 was sent to Brest at 0819:11, which was acknowledged immediately. At the same time, an electronic tick appeared on the Electronic fps on the Planner's Workstation and the diamond target symbol of the A320 changed colour on the Tactical workstation.

THE NATIONAL AIR TRAFFIC CONTROL COMMISSION (CNCSA) reports that the B737 contacted Brest JS Sector of CRNA/West at 0822 reporting maintaining FL330 on a direct route to ORTAC and requesting FL390. The controller approved the climb and told him to route ORTAC BLV (Bilbao). The flight strip was received at the Sector at about the same time. The A320 was routeing from Scandinavia to Malaga following the B737 by 3.7nm. The A320 strip had been received at the Sector at 0819 but it had not been integrated at the time that the climb clearance was given to the B737 and the A320 was not showing on radar between 0822:28 and 0823:16.

Other established facts:

The MT2 alarm (display on the radar which lists flights in the sector not shown by the STR) was

AIRPROX REPORT No 211/02.

inactive because the subject ac were situated outside the volume of J Sector.

A change of Radar controller took place at 0822 which was co-incident with the loss of radar contact but the Standard controller had remained in position.

After the safety net triggered at 0824:31, the radar controller instructed the B737 pilot to stop climbing immediately at FL340. This was followed almost immediately (0824:45) by the controller instructing the B737 to descend immediately back down to FL340.

At 0825:02 the safety net switched off followed 4 sec later by the B737 pilot reporting level at FL340.

The minimum separation distance was 3.3nm horizontally and 300ft vertically. [UKAB Note (1): This occurred at 0824:46 as the B737 stopped its climb at FL347, with the A320 almost directly 'line astern' at FL350, before descending down to FL340].

The A320 contacted the JS Sector of CRNA/West at 0825:38 reporting level at FL350. This had been a late call, having been transferred by London shortly after the B737, the crew had mistaken the frequency and had returned to London prior to calling Brest.

The climb clearance given to the B737 was issued prior to the ac entering the free manoeuvring zone (within 30nm of ORTAC) defined in the letter of agreement.

Post incident, within the STR mosaic square concerned (N of ORTAC) and in a nearby square, the Brest radar has replaced the Boulogne radar in complementing the Avranches radar. The Boulogne radar is optimised for CRNA/North traffic and has poorer performance to the N of ORTAC than the Brest radar. However, this does not safeguard against losing radar contact in the future but it does provide improved safety in this area. Beyond 40nm N of ORTAC, it is impossible to guarantee perfect radar coverage as the Avranches radar is 'weakened' by the density of LTMA traffic as well as that in the Paris region.

ATSI endorsed the LACC report.

UKAB Note (2): The LACC MATS Pt 2 Wor 2.5 para 2.5.5.2 under Coordination with Brest via Sector19/20 states that for Transfer of Control – Sector 20 to Brest *“Unless otherwise notified by the S20 Tactical on the direct radar line, LTMA departures are released to Brest for climb and all southbound flights are released for vectoring within 5nm of the centre-line of N866/UN866 and UR1 when 30nm or less from ORTAC.*

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included a report from the pilot of the B737, RT frequency recording, radar video recordings, reports from the air traffic controllers involved and reports from the appropriate ATC authorities.

Although the Airbus was not showing on radar for a 48sec period, members believed that the Brest JS Sector Controller (SC) should have assimilated the A320's presence from his fps display. However, for whatever reason, the A320's fps had not been integrated into the display, some 3 minutes after it had been received, when he climbed the B737 into conflict with the Airbus. This had caused of the Airprox. Furthermore, this action had been carried out when the subject ac were >30nm from ORTAC, contrary to the Letter of Agreement between Brest and LACC.

Members were disappointed that the A320 crew had not furnished a report to UKAB on their view of the incident but in this case, sufficient information was available to enable a risk assessment to be carried out. After the controller had been alerted to the situation when his 'safety net' triggered, he had stopped the B737's climb and issued descent clearance back down to FL340. The B737 crew had reacted swiftly to the instructions, arresting the climb at FL347 before descending; no TCAS alerts had been received. The radar recording showed that throughout the encounter, both ac had been flying at similar speeds, in 'trail', with a very slow 'catch-up' factor by the A320 - at the CPA the A320 was still 3.3nm behind the B737. These elements combined were enough to persuade the Board that during this incident there had been no risk of collision.

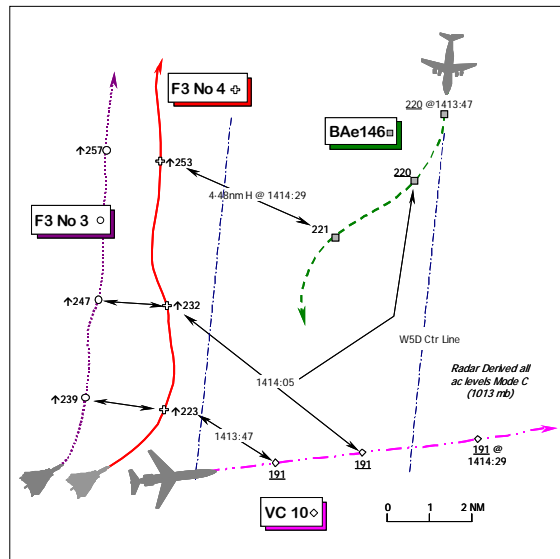
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Brest JS SC did not assimilate the A320's details and climbed the B737 into conflict with the A320, contrary to the Letter of Agreement between Brest and LACC.

Degree of Risk: C

AIRPROX REPORT NO 212/02

Date/Time: 29 Oct 1414
Position: 5819N 0145W (35nm S of BEKET)
Airspace: ADR-W5D/FIR/ (Class: F/G/B) UIR
Reporting Aircraft Reported Aircraft
Type: BAe146-200 Tornado F3
Operator: CAT HQ STC
Alt/FL: FL220 NR
 (QNH)
Weather VMC No Cloud VMC NR
Visibility: Good NR
Reported Separation:
 500ft V, 1nm H 11nm H
Recorded Separation:
 4.48nm H - 10.81nm H -
 3200ftV 100ft V



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BAe146-200 PILOT reports he was inbound to Aberdeen on ADR W5D, flying in level cruise in VMC at FL220, heading 185° at 280kt. Whilst under a RCS, he thought, from SCOTTISH CONTROL on 126.25MHz, SCOTTISH advised them of traffic 15nm W operating at the same level whose intentions were unknown. Shortly afterwards the controller advised that the traffic was still manoeuvring and to turn R onto a heading of 270° for avoiding action. The traffic was not sighted and whilst in the R turn a TCAS TA was enunciated with 3 targets below his ac, but all within 1000ft. He was then instructed to turn L onto a heading of 180° with the other ac now visible on his port side and well clear. He assessed the minimum separation was 500ft and 1nm; the risk was "medium to high". He was concerned that the other traffic, which might have

been participating in a JMC, was not identified and ATC were not aware of the other pilots' intentions.

UKAB Note (1): Subsequent consultation with the BAe146 pilot's company revealed that the crew did not see the VC 10 at any time, but did see "small" ac that were possibly Tornados. The crew was fully aware at the time that there was to be a 'military exercise' in the area, from the NOTAMS promulgated.

THE TORNADO F3 PILOT reports that he was flying as the No3 of a 4-ship F3 formation, leading a section of 2 ac conducting 2v2 tactical intercepts against a Falcon & Hawk pair during a Joint Maritime Course (JMC) sortie. He was in receipt of an ADIS (equating to a RIS) from a Weapons Controller (WC) aboard an AWACS ac, who

AIRPROX REPORT No 212/02.

informed them of a southbound “stranger” on the ADR [the BAe146] which was avoided. After the sortie the AWACs crew informed him that the crew of the airliner had filed an Airprox. He assessed the risk of a collision as “nil”, and added that they had AI contact on the BAe146 via JTIDS (an air defence datalink) throughout. His ac is camouflage grey, but the HISL was on.

The F3 pilot’s report also included a summary of the sequence of events leading to the encounter, provided from onboard equipment that indicated that the civilian ac, was shown on the JTIDS picture, which was assessed as “good”. By 1411:30, the No3 had gained AI radar contact at a range of 28nm. The Nos 3&4 turned onto North and climbed, and the WC called the BAe146 - bearing 050-14nm at 22000ft - to the formation. At 1414:00, the No 3 retained radar contact with the civilian ac until passing 25000ft when AI contact was lost. He thought the civilian ac passed down the starboard side at a range of 11nm. [UKAB Note (1): Minimum horizontal separation was actually 4.48nm.]

THE HEBRIDES/MORAY SECTOR CONTROLLER (HEB/MOR SC) reports that the BAe146 was southbound on W5D at FL220 under a RAS. S of BEKET he advised the crew of military traffic operating 25nm to the SW at FL190 tracking east, squawking A4722 – the VC10. He also told them about 2 further contacts 15nm W, squawking A1604/1605 – respectively the Nos3&4, operating below FL220 tracking SE; these 2 ac were then observed to climb. Avoiding action was issued to the BAe146 crew to turn R onto 270°, whereupon the crew advised they had the other ac displayed on TCAS. He observed the 2 jets turning L onto a northerly course and climbing above FL235, so the BAe146 crew were instructed to resume their own navigation to SCOTSTOWN HEAD (SHD), but they did not mention at that stage that they would file an Airprox.

THE SENTRY AWACS WEAPONS CONTROLLER (WC) reports that he was controlling a work up serial during the JMC. The participants included 4 F3s, 2 Hawks, 2 Falcons and one VC 10 tanker. At the time of the Airprox, tactical direction of the Hawks and Falcons had been handed over internally to another controller onboard the Sentry. Therefore, he was providing tactical direction under a RIS to the 4 F3s

[operating as 2 pairs] and the VC10; all ac were operating on the ‘Force QNH’ (1009mb).

At about 1410, the F3 pair - Nos 3&4 - and the VC10 were operating in the SE corner of the Fighter Area of Responsibility (FAOR) North when he observed traffic at FL220 Mode C, southbound on W5D - the BAe146. Nos 3&4 were ‘capping’ at a similar altitude, some 20-25nm from the BAe146 with the VC10 tanker 25nm SW of the BAe146 maintaining his ‘sanctuary’ altitude of 19000ft (1009mb) on an easterly heading. He passed traffic information to Nos 3&4 at 1410:24, at a range of 20-25nm, initially related to a tactical reference point, “*Non-player, Bullseye 145/91 at 22,000 southbound*”. Subsequently, he reported the ADR traffic to the VC10 crew at 1412:01, “[C/S] *you have stranger traffic [bearing] 045/26 [nm] southbound, FL220*”. At 1413:02, he reported the BAe146 to the VC10 crew again “*...traffic is...040/20, left to right at 22,000*”. Whereupon at 1413:08, the VC10 crew reported visual contact. He called the BAe146 to the No1&2, then Nos3&4 again at a range of 14nm at 1413:45, when the F3s were already turning away to the west but he did not specify the C/S, “*...stranger traffic...050/14 southbound at 22,000 acknowledge*”. At 1413:56, he repeated the call, “*that’s for [C/S] 3 and 4...050/12 now southbound at 22,000 acknowledge*”, which they did at 1414:03. The ADR traffic then turned towards the Nos3&4 briefly, before resuming its southerly heading. The VC10 passed ahead of the BAe146 by about 12nm, he thought, having already called visual, with 3000ft vertical separation also indicated on Mode C.

[UKAB Note (2): Excerpts from the AWACS RT transcript have been inserted here within the WC’s report for completeness, but the timings do not correlate accurately as the range bearing information given is at variance to that displayed on the ScACC Aberdeen radar recording.]

ScACC provided a very comprehensive report with the Aberdeen radar recording, which has been edited here for brevity and to avoid duplication. The BAe146 was flying southbound to Aberdeen on ADR W5D at FL220 under a RAS from the band-boxed HEBRIDES/MORAY Sector, which were combined and single-manned into one Strategic/Tactical controller. When the flight was 20nm S of BEKET firstly traffic information

and later avoiding action was given against military targets operating adjacent to the ADR.

[UKAB Note (3): Analysis of the ScACC HEBRIDES/MORAY SC's RT transcript reveals that at 1412:10, the controller passed to the BAe146 crew "...traffic information for you in your right half past one range of 25 miles...FL190 unverified, gonna cross right to left in about 2 minutes time intentions unknown", which the crew acknowledged "...looking". At 1412:50, the controller informed the BAe146 crew of "another two aircraft manoeuvring about...15 miles to the west of your present position...both the aircraft below FL220 tracking south east intentions unknown", which the crew acknowledged "...understood". Avoiding action was issued at 1413:26. "...avoiding action turn right heading 270°" that was acknowledged. Some 24 seconds later at 1413:50, the controller informed the BAe146 crew that "...2 of the previous mentioned contacts seem to be tracking north now gonna pass down just and pass in front of you". The BAe146 crew responded at 1414, "understood we have them on TCAS and...we're just...turning onto the heading of 270". Whereupon the SC countered "[C/S] turn left again heading 180 degrees", which the crew acknowledged before the SC added "...both those ac to the west of you now are both indicating above your level". The BAe146 crew responded at 1414:30, "...understood they've gone from TCAS now...thanks for your help anyway and we have a visual with them down on our left hand side" – in all probability the VC10. Whereupon the SC added "...in your left hand side has been maintaining an easterly track you can resume own navigation now direct Scotstown Head".]

The required separation minima between GAT and ac squawking unverified Mode C outside CAS is 5nm or 3000ft vertical. Radar recordings show that the separation achieved as a result of the combined manoeuvres of the BAe146 and F3s resulted in a minimum horizontal separation of 4.48nm at a vertical separation of 3200ft Mode C. Interpolating between radar refresh sweeps, when the closest F3 was 5nm from BAe146 there was 2800ft vertical separation and thus only a minor loss of separation. However, the pilot of BAe146 reported the minimum separation as 500ft/1nm. The controller was providing a combined service for both MORAY and HEBRIDES sectors. However, the workload was

such that this additional responsibility did not detract from his ability to handle the incident effectively. The RAS was correctly provided in accordance with ScACC MATS Part 2. MATS Part 1 Chapter 5 para 1.4.1(e) specifies that: "Controllers shall pass avoiding action instructions to resolve confliction with non-participating traffic and, where possible, shall seek to achieve separation which is not less than 5nm or 3000ft, except when specified otherwise by the CAA. However, it is recognised that in the event of the sudden appearance of unknown traffic, and when unknown aircraft make unpredictable changes in flight path, it is not always possible to achieve these minima". The SC observed three military tracks. One, squawking A4722 – the VC10 tanker - at the time of the incident was indicating FL191 and heading steadily E. The other two, F3s, squawking A1604/1605 – respectively Nos 3&4. The SC passed traffic information on the VC10 tanker when it was 25nm away, and shortly afterwards gave further information on the two F3s, which at that point were 15nm away. He determined that the required separation under the RAS could not be assured while the BAe146 continued on W5D and that the safest action was a R turn in order to keep the airliner clear of the projected acs' tracks. The timing of the avoidance instruction was such that had the BAe146 been left on its original course, separation against the VC10 would have reduced to about 4nm. [But 2900ft unverified Mode C separation would have been maintained.] In the 25 sec between the avoidance instruction and the controller's next call at 1413:50, the two F3s turned L 90° from south easterly onto north easterly headings. This left the controller little chance to give a corrective turn as now the fighters were blocking the new course. However, the fighters were clearly acting simultaneously to avoid the civil ac, since they continued the turn onto N and initiated a climb. The radar recording shows that when the airliner commenced the R turn at 1413:47, the F3s had already made a positive L turn, had commenced a climb and were passing FL223. The radar recording shows that the military jets climbed initially at 3800ft/min and ultimately at 6800ft/min. When the easterly No4 F3 and the BAe146 were just over 10nm apart, the ac were at the same level; when horizontal separation had reduced to 4.48nm at 1414:29, the vertical separation was greater than the required minimum, at 3200ft. Interpolating between radar sweeps, at 5nm the vertical separation was about

AIRPROX REPORT No 212/02.

2800ft – i.e. there was a marginal loss of separation. It is considered that the civil controller fulfilled the requirement of the RAS in that he gave a satisfactory degree of avoiding action to achieve the stipulated separation. Because he was unable to co-ordinate with their controlling authority he did not know their intentions; he had considered giving a further avoidance turn to the BAe146 but rejected this as he could see that the military jets were climbing.

The JMC exercise in progress at the time of the incident meant that there was an abnormally high degree of military activity around the Scottish ADR structure, since FAOR North lay squarely over the northeastern part of Scotland. Planning for the JMC had included co-ordination with ScOACC and the exercise had been fully promulgated to civil controllers in ScACC Temporary Operating Instruction 101/02, to military participants in Airspace Co-ordination Notice (ACN) Number 02-10-0034 and to civil ac operators via NOTAMs - H5134 (14 Oct 02) and H5216 (18 Oct 02) dealt specifically with general exercise procedures and the airspace in FAOR North. The ACN addressed the subject of ADRs, stating that participants should take due regard of the published Advisory Routes in the Scottish FIR and be aware of their probable use. Arrangements are currently in hand for a meeting between ScACC representatives and appropriate RAF staff, at which areas of concern can be tabled and agreement reached on the action necessary to minimise the risk to civil operators.

ATSI endorsed the ScACC ATCI report.

THE TORNADO F3 PILOT'S STATION comments that the F3 pilots took appropriate avoiding action in good time, turning and climbing to maintain separation. Although the No3&4 did not make visual contact with the BAe146, conditions were VMC and he had good radar contact with the civil ac.

ASACS SSU, who provided a tape transcript and complete set of reports from those involved, commented that the F3s were receiving a limited RIS from an RAF E3D AWACS ac. The Airprox occurred during a period of JMC activity and the F3s were operating within a designated FAOR for the exercise notified by AUS to airspace users under ACN 02-10-0034 on 7 Oct 02.

The E3D WC gave traffic information about the BAe146. Though the F3 crews missed the WC's initial stranger call this was repeated at 14 nm, which was acknowledged. The BAe146 was subsequently seen to turn onto a westerly heading towards the F3s, which had the effect of reducing the horizontal separation between ac.

The action taken by the WC was entirely in accordance with the type of service being provided and there was no breach of safe separation. Against this background, the separation reported by the BAe146 crew of 500ft/1nm horizontal is somewhat perplexing.

THE BAE146 OPERATOR commented that they were encouraged that areas of concern were to be reviewed by ScACC and military staffs and awaited their findings.

HQ STC comments that whilst the F3s maintained separation from the ADR, and avoided the BAe146 by a wide margin, it is curious that the AWACs control team was not able to maintain a dialogue with Scottish MILITARY, to allow them to inform each other of their respective traffic. Given that ScOACC had been involved in the planning for the JMC, it is perplexing that a co-ordination frequency between ground and airborne radar units was not available.

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 some military pilots thought that when operating under the control of an AWACs WCs could co-ordinate with other affected ATCRUs, this is not the case. A military controller member remarked that no mechanism existed whereby AWACS WCs could coordinate their individual ac with that of ATCRUs and whilst this had indeed been trialled it had apparently proved unsuccessful.

The complete and comprehensive reports provided by the respective controlling authorities had shown that the minimum horizontal

separation here between the closest of the F3s – the No4 - and the BAe146 was 4.48nm; the former remaining outside the lateral confines of the ADR. Additionally the VC10 tanker had flown 3000ft below the airliner as the tanker crossed through Class F airspace and in visual contact with the BAe146. During this widely promulgated exercise – of which the BAe146 crew was cognisant – prior co-ordination had ensured that the presence of the ADR had been highlighted to participants within the applicable ACN, who had taken ‘due regard’ of the potential for encountering GAT whilst legitimately operating in the vicinity of or through W5D. Moreover, members noted that the F3 crews were entirely aware of the presence of the airliner from the traffic information provided by the WC and had taken positive action to ensure that they flew clear. Thus the reporting BAe146 pilot was mistaken when he opined that the minimum separation was 500ft/1nm, but similarly,

the No3 F3 pilot was also somewhat wide of the mark with his separation assessment. Whilst the detailed analysis by ScACC had revealed a minor erosion of standard Mode C separation minima, in the Board’s view, the HEB/MOR SC had acted entirely correctly and this ‘controlled’ encounter did not constitute a proximity hazard, nor was the safety of the ac involved compromised at any stage. Hence, the Board concluded unanimously that this was purely a sighting report where no risk of a collision had existed at all.

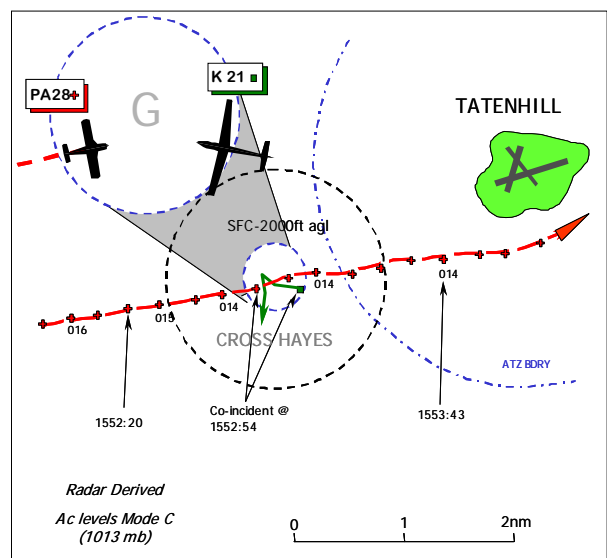
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Sighting report.

Degree of Risk: C.

AIRPROX REPORT NO 213/02

Date/Time: 19 Oct 1553 (Saturday)
Position: 5247 N 0149 W (6nm W of Burton-on-Trent)
Airspace: London FIR (Class: G)
Reporting Aircraft Reported Aircraft
Type: K21 Glider PA28
Operator: Civ Club Civ Pte
Alt/FL: 1200ft 1000ft
 (agl) (agl)
Weather VMC VMC CLOC
Visibility: 8km 25km
Reported Separation:
 100ft H, 100ft V 500m H, 200ft V
Recorded Separation:
 Contacts merged



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE K21 GLIDER PILOT reports that he was in the latter stages of a winch launch from Cross Hayes gliding site. He was in the process of reducing the climbing attitude prior to cable release when a powered ac appeared ahead at 100-150ft distance and about 100ft above. The nose was lowered further to reduce the climb rate

and the other ac passed, without appearing to take avoiding action, at about 1200ft agl on a roughly reciprocal heading. The ac was not seen earlier as it had approached opposite to the direction of launch and would have been obscured by the glider’s nose during the steep initial climb. In assessing the risk, the pilot

AIRPROX REPORT No 213/02.

thought that the other ac was fortunate not to have hit his glider or the attached steel cable. The glider was coloured white with red wingtips.

THE PA28 PILOT reports that he was approaching Tatenhill aerodrome from the west with the purpose of landing there after a flight from Haverfordwest. Prior to contacting Tatenhill Radio (124.075) he had called on the common gliding frequency and had received no answer. Contact with Tatenhill was established at 15nm range and he was advised that no gliding activity was taking place at Cross Hayes. As he approached Tatenhill he saw a glider which he reported as being under aero-tow and adjusted his flight path so as to pass with 500m lateral and 200ft vertical separation. He assessed that there was no risk of collision. He observed that the glider (and reported tug) were close to, or inside Tatenhill's ATZ without being in radio contact. The pilot thought that the glider (and tug) were operating in an irresponsible manner in not making RT calls, given their proximity to the ATZ.

UKAB Note (1): Cross Hayes gliding site (320ft amsl) is promulgated in UK AIP ENR 5-5-1-2 as being active Sat, Sun, PH & Wed, during daylight hours, with a vertical limit of 2000ft agl.

UKAB Note (2): Further discussion took place with Tatenhill Aerodrome to clarify the procedures in place for Cross Hayes, which is just outside the Tatenhill ATZ. This produced the following observations:

- a. A letter of agreement (LOA) exists whereby the gliding club at Cross Hayes notifies Tatenhill when gliding is taking place. However, this arrangement is not foolproof and notification is not always received.
- b. There is no current requirement to notify that activity is ceasing. Additionally, it is often not possible to see airborne gliders from Tatenhill, so personnel there are reliant upon such reports.
- c. On occasions, depending on the RW in use, the gliders have permission to penetrate part of the ATZ. Whilst there is no requirement for the gliders to establish comms with Tatenhill, there is an assumption that suitably equipped ac would monitor 124.075.

d. If Tatenhill had not been informed of gliding activity, and bearing in mind that notification did not always take place, they would most likely have responded to the PA 28's enquiry with a statement to the effect that they were not aware of activity, rather than stating that there was none.

UKAB Note (3): Further discussion also took place with the two pilots. The K21 pilot could not recall any other gliders being airborne at the time, but could not be certain. The incident was observed by another pilot who was in a glider on the ground at the time and who made a brief RT call to the PA28. The reporting pilot's glider was equipped with a radio but this was switched off at the time of the Airprox. The PA28 pilot had reported seeing a glider under tow and it was necessary to confirm that he had in fact seen the reporting K21. He confirmed that the ac he saw was over Cross Hayes site, but made an assumption that it was under tow, based on the fact that he also saw another ac in the vicinity which he thought was the tug. However, he accepted that the other ac may have been a glider too. He was initially preparing to land "straight in" on RW08 but changed his intentions when he sighted the glider, maintaining his altitude and turning slightly right to position downwind for RW26.

UKAB Note (4): The gliding club at Cross Hayes is equipped with an A/G facility on the gliding common frequency of 129.9. Normal launch procedures at the site require that a ground instructor located at the launch site, and an observer at the winch point, both visually clear the area prior to launch. Both were on duty at the time of the Airprox.

UKAB Note (5): Analysis of the Clee Hill radar recording shows a return, identified as the PA 28, approaching Tatenhill from the west. The return passes over the Cross Hayes site and as it does so, a primary return, believed to be the K21, appears less than ½nm ahead. The tracks then merge, with the PA28 Mode C indicating 014 [equating to about 1200ft agl, based on Met Office archive data], before carrying on in a straight line towards a downwind position for RW26 at Tatenhill. The primary return remains in the immediate area for a further 5 sweeps before fading from radar.

UKAB Note (6): The UK AIP at AD 2-EGBM AD 2.17, promulgates Tatenhill ATZ as a circle radius 2 NM, centred on RW08/26, from the surface to 2000 ft above the aerodrome elevation of 450 ft and active in Winter from 0900 – 1700. An A/G Station C/S Tatenhill RADIO is available on 124.075MHz during A/D hours.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It was evident from the PA28 pilot's report that he was aware of the nature of the activity at Cross Hayes gliding site, which is clearly marked on appropriate CAA VFR charts adjacent to the Tatenhill ATZ boundary. Members noted that the PA28 pilot had called on one of the common glider frequencies to establish what was going on at the site, though he did not mention which one of the four frequencies available for use throughout the UK FIRs he tried. The potential for error here was readily apparent to the Board as the frequency that might have been in use is not promulgated within the AIP. Though another glider pilot had reported transmitting to the PA28 as he saw it overfly the site, again it was not evident if this was in reply to the PA28 pilot's call or a blind broadcast on another frequency, but by then it would have been too late anyway. Furthermore, the reporting glider pilot, who had his radio switched off would have been oblivious to any of these messages. The visiting PA28 pilot affirmed that he had received information from Tatenhill RADIO that gliding was not in progress at Cross Hayes. The Board was advised that whereas Tatenhill will inform visitors of known activity, from subsequent discussions with the A/D operator it would appear that any such information provided by the A/G operator would probably not have been so definitive and any status given would appear to be somewhat vague. However, without recorded RT, which is not a compulsory requirement for A/G stations, these anomalies could not be resolved with any certainty. Thus members understood that the PA28 pilot had tried to ascertain whether Cross Hayes was active, but whatever answer he might have received it was apparently wrong or it had been open to misinterpretation. The arrangements stipulated within the LOA for

notification of this activity between the adjacent flying units appeared to the Board to be somewhat ineffective with significant potential for confusion. Given that this Airprox did not occur within the Tatenhill ATZ, but very close to the boundary, there was no apparent requirement for the gliders to communicate with Tatenhill RADIO. Nevertheless, the arrangements stipulated in the LOA appeared at odds with the 'Rules of the Air' in this respect and members believed that a review of the notification and communication arrangements between Cross Hayes and Tatenhill in the LOA would be worthwhile, which a GA member undertook to progress.

Evidently, the entry in the AIP about Cross Hayes is only a warning and does not prohibit pilots from flying through this airspace. However, the danger from the winch cable especially and the launch of gliders from the site was self-evident and constituted a definite hazard to other ac in the vicinity. The responsibility for avoidance of such a legitimate notified activity was solely that of other pilots. However, in the Board's opinion flight in the vicinity of an active site during its promulgated period of activity below the maximum height that winch launches could attain, was fraught with danger and constituted poor airmanship. The PA28 pilot reported that he had seen a glider and a tug, whereas the horizontal separation stated by the pilot – 500m - was significantly more than that stated by the reporting glider pilot – 100ft [30m]. There were no aero tow launches by tug taking place, it would appear and the radar recording showed that the PA28 had flown directly over the glider site and its radar contact had merged with that of the glider. This convinced members that the PA28 pilot had not actually seen the subject glider during its winch launch, which a GA member who had spoken with the PA28 pilot confirmed. The Board agreed, therefore, that this Airprox had been caused by the PA28 pilot, who flew through a notified glider site, believing it to be inactive, into conflict with the winch-launching glider, which he did not see.

However, the Board recognised that it was also incumbent on the winch launch party on the ground to ensure that the volume of airspace into which the glider would be projected was, and would remain clear of other ac, for the period of the launch. Despite looking out, neither the instructor at the launch point, nor the ground observer at the winch apparently saw the PA28 in

AIRPROX REPORT No 214/02.

time before the launch, which in the Board's opinion was a contributory factor to the Airprox. It was clear that the glider pilot had not seen the PA28 until his glider's climbing attitude reduced near the top of climb and he was about to cast off the cable. This sighting and subsequent avoiding action was opportune, enabling the glider pilot to effect in his opinion about 100 ft of vertical separation against the PA28 that, in the Board's view, was enough to avert a collision. Nonetheless, the close proximity of the PA28 with its pilot unsighted to the danger below – not only from the glider but also from the cable – led the Board to conclude that the safety of the subject ac had indeed been compromised.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The PA28 pilot flew through a notified glider site, believing it to be inactive, into conflict with the winch-launching glider which he did not see.

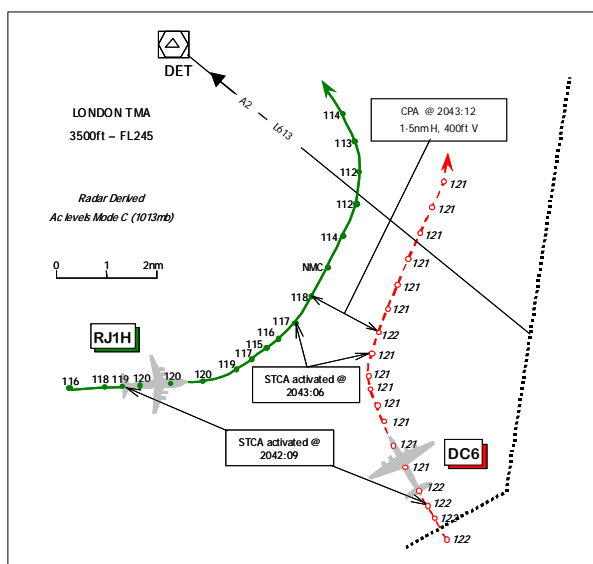
Degree of Risk: B.

Contributory factor: Neither the winch point safety observer nor instructor at the launch point, saw the approaching PA28 before the launch was initiated.

AIRPROX REPORT NO 214/02

Date/Time: 31 Oct 2043 Night
Position: 5112N 00041E (6.5nm SE DET)
Airspace: London TMA (Class: A)
Reporting Aircraft **Reported Aircraft**
Type: RJ1H DC6
Operator: CAT CAT
Alt/FL: FL120 FL120

Weather: VMC CAVOK VMC CAVOK
Visibility: >10km >10km
Reported Separation:
NK H, Nil V <4nm H, NK V
Recorded Separation:
1.5nm H, 400ft V



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE RJ1H PILOT reports that, following departure from Gatwick, he was in contact with London Control on 120.52, who cleared his ac on radar hdg of 095° to FL120. The frequency was very busy with frequent step-ons. When level at FL120 and maintaining 265kt, TCAS traffic was noticed at the same level at 2 o'clock. ATC gave avoiding action to turn L immediately on to hdg 340° and climb to FL130. As ATC gave the instruction the TCAS target became a yellow TA at 1 o'clock same level, shortly followed by an RA to descend. ATC was advised of the TCAS RA

descent and PF, the FO, disengaged A/P and initiated a descent. On reaching FL114 "Clear of conflict" was given by TCAS. Hdg 340° was selected and, by a smooth change of attitude, climb back to FL120 initiated. However, passing FL116 a second RA descent was triggered and this time the ac was descended to FL110. ATC then advised that traffic was clear and clearance was given to climb to FL130.

He added that the frequency was particularly busy and at the time of the incident he was about to

contact ATC because he thought they had forgotten him. The other ac was never seen, although it was evident from TCAS that it was close. Each RA was complied with and on both occasions the crew had tried to regain their cleared level, although this was only achieved once the contact had ceased to be a threat.

THE DC6 PILOT reports that he was en route from Valencia to Coventry, cruising at 200kt at FL120. He was in receipt of a service from London Control and squawking 0641 with Mode C. The ac's nav lights and 2 anti-collision beacons were selected on but the ac was not equipped with either HISLs or TCAS. Approaching DET VOR on a hdg of 335° ATC gave an avoiding action turn R onto 030°, which was complied with immediately. The lights of another ac were seen at 11 o'clock initially, moving round to the 9 o'clock, or less, as the R turn was made. The other ac was seen to descend and then turn L onto a northerly hdg before climbing. From an RT transmission he gathered that the other ac was within 4nm. FL120 was maintained throughout and during the turn the wing illumination lights were selected on to improve conspicuity. He assessed risk of collision as low.

THE TC BIGGIN/TIMBA SC reports that during a busy session he returned [his attention] to the RJ1H climbing to FL120, hdg 095°, [intending] to turn it NW and climb further. He saw it would conflict with the DC6 at FL120. The SMF also activated. He called the traffic and instructed a L turn and climb to FL130. The RJ1H pilot replied that he had a TCAS descent. This was acknowledged. Traffic was then called to the DC6 pilot together with a R turn to avoid. The pilot of the DC6 replied that he had the traffic in sight.

ATSI reports that at the time of the Airprox, both ac were under the control of the TC BIGGIN/TIMBA SC who was operating the 2 sectors in a 'boxed' mode. Workload had been light when he had taken over the sector, however there had been a number of pending departure strips and subsequently both workload and traffic became 'very busy' in a short period of time.

The DC6 had been co-ordinated into the Biggin Sector at FL120, routeing RATUK – DET – LAM. The SC said that he had highlighted the ac's SSR label on his radar to remind him of its presence at a level, which was likely to affect traffic on his

sector for a significant period of time. When the radar recording was replayed in 'slave mode', it was not apparent that the label had been highlighted and so it was not possible to corroborate this statement.

At 2035:55, the RJ1H crew established communication with the SC, advising that they were following a LAM SID and passing 1500ft. They were instructed to fly heading 095°, after passing 3000ft, and the ATC speed restriction was removed. Shortly afterwards, the crew were given clearance to climb, first to 6000ft and then to FL120. The DC6 established communication with the SC, at 2039, and reported maintaining FL120 on track to DET; at that time the DC6 was 30nm SE of the RJ1H, which was passing 6000ft in its climb to FL120. The SC was then occupied dealing with calls from other ac coming onto his frequency; by 2041, numbers reached 11.

At 2042:09, STCA activated between the RJ1H, just levelling at FL120, and the DC6, which was 1 o'clock to the RJ1H range 6-7nm. The SC advised that he had seen the conflict, fractionally before STCA activated, and had started transmitting "[RJ1H] c/s avoiding action turn L L immediately hdg 350 climb FL130". The crew replied "Roger L hdg and er....". As the ac were now only 5nm apart the SC transmitted, at 2042:20, "Climb immediately FL130 traffic is 2 o'clock 4 miles R to L". The crew replied "130, getting a descend warning descend". Although no mention of TCAS was made, the SC believed that the RJ1H was reacting to an RA and so turned his attention to the DC6, which was not TCAS equipped, transmitting: "...c/s avoiding action turn R immediately hdg 030 traffic on your L". The crew acknowledged this instruction and reported 'visual' with the traffic. The SC then concentrated on dealing with other traffic on his busy sector whilst the conflict between the DC6 and the RJ1H was, seemingly, being resolved. He should have continued to monitor the situation, as the crews' intentions were unknown, however, it is accepted that his workload was high at the time.

Analysis of radar and RT recordings confirmed that the SC started passing avoiding action to the RJ1H at 2042:09, when its Mode C readout indicated FL119. The Mode C remained between FL119 and FL121 until 2042:39, when it reduced to FL117 and then to FL115. However, at 2042:58, the Mode C indicated FL116 and then

AIRPROX REPORT No 214/02.

increased to FL118, activating STCA again, although there was no communication from the crew of the RJ1H. During this latter climb, separation reduced to its minimum of 1.5nm and 400ft. The readout then reduced again to FL113 and, at 2043:30, the crew transmitted "...c/s is FL110 still showing the traffic at 1000ft above us". The SC advised that they were clear of the traffic and instructed them to climb to FL130 on a heading of 325°.

When asked about the workload on the sector, the SC stated that, prior to taking the bandboxed position, he had checked the traffic prediction device. This showed very little traffic forecast but there were a large number of 'pending' outbound strips. He explained the usefulness, or otherwise, of the CCTV displays for alerting controllers to bunches of departures about to get airborne. The screen for Heathrow outbounds was a very useful planning tool. Ac departed in the order shown on the screen and it was clear when they were about to get airborne from the symbology used. Whereas this was not the case with the screen for Gatwick departures, on which ac callsigns appeared on the TV display only once the ac called for pushback. Entries were then only updated on the screen when they got airborne, and a departure message was automatically sent from NAS [the flight data processing system] to the CDIS [Controller Display Information System]. Frequently, traffic appeared on the radar display before being shown as airborne on the CCTV. However, although the Gatwick departures' CCTV provided little in the way of warning that departure numbers would increase quickly, the presence of an increased number of pending flight progress strips should have alerted the SC to the situation. Furthermore, on this occasion, no Minimum Departure Interval had been applied and so ac were reporting on frequency in quick succession.

A commonly used practice adopted by many controllers on these sectors is for northbound Gatwick outbounds to be cleared not above FL120 until they have passed the track of any traffic inbound to Gatwick via DET, which would be descending to FL130; having crossed, northbound departures are then climbed to the 'agreed level' of FL130 iaw the standing agreement for transfer to the next onward sector. But in this case, the SC had noted the DC6 and assessed that there would be plenty of room to effect a safe climb through with the RJ1H.

However, soon after he took over the position the workload unexpectedly began to increase significantly. An analysis of the RT showed that in the period 2035-2047 a total of 22 ac came under the control of the sector. This unexpected volume exceeded the level normally associated with bandboxed operations. The SC did not ask for the sector to be split because nearly all the traffic was on the BIGGIN sector and a 'normal split' (ie BIGGIN and TIMBA) would have achieved little. It is possible to split the sectors with one controller dealing with inbounds and the other outbounds, but this configuration requires considerable co-ordination between the 2 controllers and hence is not used very often.

The SC had followed his normal practice by climbing the RJ1H to FL120. As it happened, there were no Gatwick inbounds to affect a climb to FL130 on this occasion. With the benefit of hindsight, the SC accepted that FL110 would have been a better choice of initial level, due to the presence of the DC6 also at FL120. Having cleared the RJ1H to FL120, he became occupied with other tasks on the sector. After STCA activated and aware that the RJ1H crew were reacting to a TCAS warning, the SC again turned his attention to other ac operating within his sector. However, the crew of the RJ1H did not follow the procedure published in CAP 579 (Airborne Collision Avoidance Systems (ACAS): Guidance Material), when they received the '*clear of conflict*' enunciation. They should have advised the controller "*Returning to FL120*", their assigned clearance, but they did not. This resulted in the SC being unaware of what was happening and the second activation of STCA, as the RJ1H climbed through FL117, came as a surprise.

When the SC issued avoiding action to both ac he used the 'old phraseology'. He said, later, that the change in phraseology delays the issuing of executive instructions and he wished to get the ac turning as soon as possible.

UKAB Note: Analysis of the Heathrow (23cm) radar data recording reveals the RJ1H, squawking 5444 with Mode C tracking 095°, with, at 2 o'clock, the DC6 tracking towards DET VOR, squawking 0641 with Mode C. CPA is shown at 2043:06, by which time the RJ1H and the DC6 are on parallel NE tracks 1.5nm apart with 400ft V 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.

Members were concerned with a number of controller supervision matters in this Airprox, starting with the SC who had taken over the banded Sector with a light workload situation which had quickly escalated to become 'very busy'. It was unclear why the Traffic Load Prediction Device, known to be an accurate tool, had not revealed the impending traffic rush to the SC when he had checked the TLPD prior to taking over the Sector. This device normally is used by the Traffic Manager, in conjunction with the Group Supervisor, to monitor the forecast traffic and then assist with the decision on when to split the Sector or to impose flow restrictions (MDI). Neither aspects appeared to have been done for reasons that remained unknown. That aside, comment was made that the number of fpss should have alerted the SC to a traffic 'spike' even though he thought the Gatwick CCTV system had done little to help, as indications on numbers would have been similar. Imposition of MDI flow control could have been used to slow the flow quite quickly (and hence the traffic peak) but single RW operations at Gatwick normally dictates a max of 1 departure every 2 min as a matter of course. Splitting the Sector would normally reduce the traffic/workload but on this occasion, with the majority of the traffic being on one of the combined component Sectors, this usual option would have been little help. ATCOs informed members that banded operations could also mean that two fps printer positions may have been amalgamated which would have produced a large number of fpss. This could mean the pending bays would be more full than normal. The NATS advisor told members that although the normal target sector flow may not have been exceeded on this occasion, it was the traffic spike which had caused the problem - with most ac calling on the same frequency in a very short period. Although splitting the Sector (inbound/outbound) had been considered but not instigated, it may have been difficult to implement during this incident when the situation had already progressed so far with such speed. However, an

additional team member on the Sector (Man and Boy mode) could well have helped. Ultimately the SC was responsible for requesting the split of the Sector or flow control, but teamwork suggested that other TC team members could have noticed the situation and helped the SC proactively by imposing or suggesting measures to relieve the flow, even if albeit temporarily (imposing MDI).

Seeing traffic cruising through the sector at FL120 was not unusual although the track of the departing RJ1H appeared to be further to the E than normal; it would normally be expected to track to the E of BIG and W of DET. Although this extended E track may have eroded the SC's planned separation, he had acknowledged the presence of the DC6 when he climbed the RJ1H to FL120 but his attention had then been absorbed by events on other parts of the sector. With hindsight, a climb to FL110 would have been a better option, but as events unfolded the climb to the same level as the DC6 had put both ac into conflict and had caused the Airprox.

Once the deteriorating situation was noticed, just prior to STCA activating, the SC had quickly issued avoiding action climb and turn instructions to the RJ1H pilot followed by a turn to the DC6 crew which started both ac turning away from each other. Good practice, not followed, would then have been to monitor the situation, particularly as the RJ1H pilot replied that he was following a TCAS RA descent which was contrary to the avoiding action climb instruction. Members commended the DC6 crew's actions, particularly that of switching on their wings lights. Their situational awareness had been good, as they had visually acquired the RJ1H to the L and watched it turn away and descend below. In the RJ cockpit, conflicting instructions were being received simultaneously. ATC had given an avoiding action climb which was opposite to the TCAS RA guidance to descend which would have taken time to assimilate before taking action. This may have been why the RJ1H did not complete the turn onto the assigned heading as he was following the vertical resolution advisory guidance given by TCAS. However, having descended and reached a level whereby TCAS had resolved the conflict and gave "*clear of conflict*", the crew should have informed ATC. Instead they initiated a climb to regain their assigned level and caused another TCAS RA to be triggered against the DC6 that was still in potential confliction above.

AIRPROX REPORT No 215/02.

Although the DC6 went unsighted from the RJ cockpit, their prompt reactions in following TCAS guidance had enabled them to avoid the DC6 throughout the encounter. Although untidy, the Board were clear that these elements combined had ensured that any risk of collision had been effectively removed.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The TC BIGGIN/TIMBA SC climbed the RJ1H into conflict with the DC6.

Degree of Risk: C

AIRPROX REPORT NO 215/02

Date/Time: 3 Sep 1147

Position: 5138N 00408W (3-5nm NW of Swansea Airport)

Airspace: London FIR (Class: G)

Reporting Aircraft Reported Aircraft

Type: C152 C130J

Operator: Civ Trg HQ STC

Alt/FL: ↑2500ft NK

(QNH 1017 mb) (RPS)

Weather VMC CAVOK VMC NK

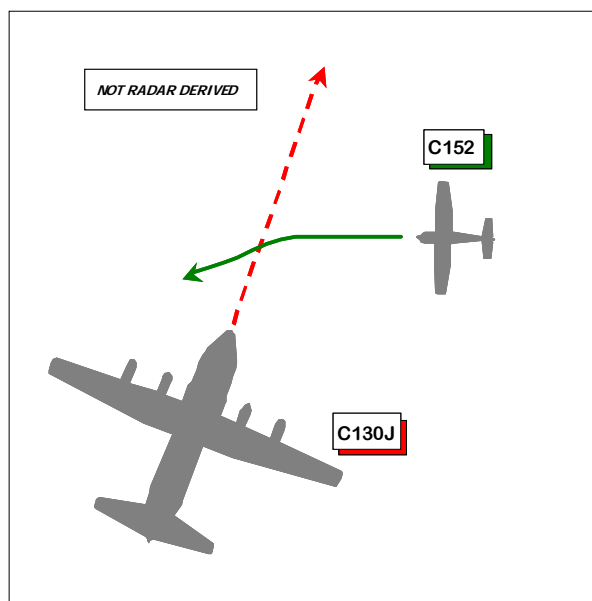
Visibility: 10km NK

Reported Separation:

150ft V, Nil H Not Seen

Recorded Separation:

NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE C152 PILOT reports that he was on an instructional sortie in good VMC and in contact with Swansea Approach on 119.7MHz. His ac was coloured blue and white and the red fin-mounted anti-collision beacon was on. However, although his ac was fitted with SSR with Mode C, it was not selected on. He was climbing out of Swansea at 70kt, having departed RW 04 and turned L onto W, and was just approaching 2500ft (Swansea QNH 1017mb) and turning slightly left when a Hercules was seen crossing from L to R approximately 150ft above and 500ft away. The Hercules passed directly overhead. No avoiding action was taken, as it was clear that they would miss each other. He adds that the high wing of the C152 would have restricted his view as he was turning just before the incident. He assessed that risk of collision was considerable.

THE C130J PILOT reports that he was the leader of a 2-ship C130J formation. His ac was coloured grey and HISLs would have been selected on. He was unable to recall seeing any other ac in the vicinity of the reported encounter, nor receiving TCAS TA or RA indications. He cannot recall being in contact with Swansea Approach and doubts that he was in receipt of a radar service from any ATS unit.

THE SWANSEA APPROACH CONTROLLER reports that the C152 pilot, who was airborne on a local training sortie and under a FIS on 119.7MHz, reported that at 1145 he had been overflown by a C130, 150ft above hdg N, and that he would be filing an Airprox. At the time of the incident the C152 was hdg W. The C130 did not call Swansea Approach.

HQ STC comments that the Hercules crew, routing only 1.5nm outside the Swansea ATZ, may have benefited from calling Swansea Approach; although not mandatory, this would have made sound airmanship sense. It is a matter of concern that the Hercules crew did not see the C152, especially as they could have expected GA traffic in the vicinity of an ATZ. Similarly, it is equally notable that the C152 pilot had his transponder selected off, which action prevented the generation of any TCAS alert to the Hercules crew. That the C152 pilot accounts for his late sighting of the Hercules to be the result of high wing obscuration is an important point needing wide dissemination amongst the GA community. It is to be hoped, therefore, that the technique of lifting the into-turn wing prior to turning will be re-emphasised by appropriate authorities.

UKAB Note (1): Met Office archive data reveals that the Wessex RPS for 1100 – 1200 was 1013mb.

UKAB Note (2): Analysis of the Burrington radar data recording is inconclusive. Because Burrington Radar was providing SSR data only, the C152, which was not transponding on SSR, cannot be seen. However, 2 contacts squawking Mode 3/A code 7001 and displaying 029 on Mode C are evident 10 nm S of the Gower Peninsular tracking 005°. By replaying the radar data recording these can be tracked back to Lyneham and identified. The pair coast in 7.75nm SW of Swansea Airport at 1145:25 and shortly after, at 1145:33, they split. One ac descends on track and fades from radar 5.3nm WNW of Swansea Airport at 1146:31, finally displaying 010 on Mode C. The other, the reported C130J, turns R by approximately 15°, maintains 029 on Mode C, and passes 3.5nm W abeam Swansea Airport at 1146:31. Thereafter, a slight L turn is apparent in the track of the C130J. It maintains 029 on Mode C and crosses the N coast of the Gower Peninsular 3.5nm NW of Swansea Airport at 1147:05. This accords with the position of the encounter as reported by the C152 pilot

UKAB Note (3): Given that the reported C130J indicates 2900ft on Mode C (1013mb) throughout its overflight of the Gower Peninsular, and that the

C152 pilot reports approaching 2500ft on the Swansea QNH (1017mb) at the time of the encounter, it is probable that minimum vertical separation was at least 520ft.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Members noted that this encounter occurred within the open FIR where each pilot had both responsibility and opportunity to see the other ac. In the case of the C130J pilot, he did not see the C152 and, because the transponder of the C152 was selected off, received no TCAS indication of its proximity. Members were unanimous in the view that non-selection of SSR transponder removed an important safety net. Several members thought that the C130J pilot should have anticipated the presence of GA traffic within such close proximity to Swansea Airport and called Swansea Approach to notify his presence.

Of the ac involved, the C130J would have been the easier to see although it is evident from the C152 pilot's report that he had been late in its visual acquisition. Members noted the C152 pilot's report that the high wing of his ac obscured the C130J and whilst there was no indication that he had not lifted the wing prior to turning, GA members stressed the importance of this technique. Additional factors may have been into sun visibility and the probability that the C152 pilot would have been looking across cockpit. Any or all of these factors may have contributed to the late sighting and also, members opined, probably led to underestimation of the separation distance a view supported by recorded radar data showing the C130J's level flight across the Gower Peninsula. Consequently, members agreed that this was a sighting report and that there had been no risk of actual collision.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Sighting report.

Degree of Risk: C

AIRPROX REPORT No 216/02.

AIRPROX REPORT NO 216/02

Date/Time: 31 Oct 1239

Position: 5234N 0048E (13½nm NE of Lakenheath - elev 32ft)

Airspace: London FIR (Class: G)

Reporter: Norwich APR

First Aircraft Second Aircraft

Type: B737-400

F15 'B'

Operator: CAT

Foreign Mil

Alt/FL: ↑FL200

Climbing

Weather NR

NR HAZE

Visibility: NR

NR

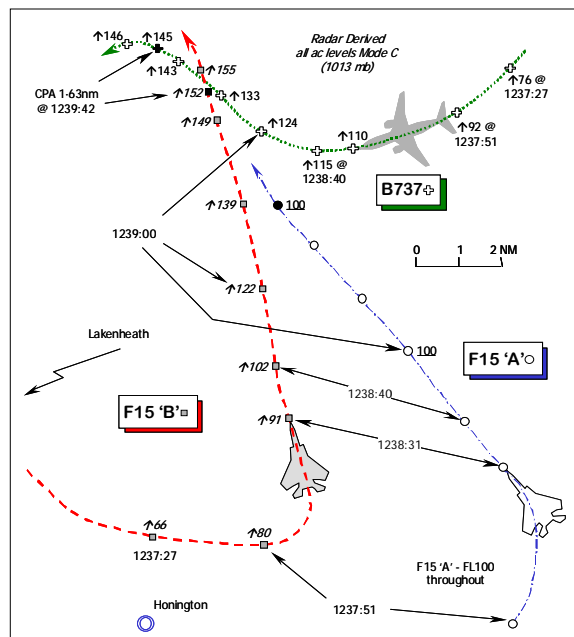
Reported Separation:

Not seen

NR

Recorded Separation:

700ft V, 1.63nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE NORWICH APPROACH RADAR CONTROLLER (APR) reports that at 1235, the B737 departed from RW27 at Norwich on track to join CAS at BARKWAY (BKY) climbing to FL200 and was placed under a RAS. When it was about 7nm SW of Norwich Airport, he observed conflicting traffic - squawking A6114 [F15 'A'] - manoeuvring overhead Honington, climbing through FL70 Mode C. Further traffic was also seen departing Lakenheath, heading E and climbing, squawking A6113 [F15 'B']. Although the conflicting traffic was still 20nm away, he issued an avoiding action R turn to the B737 crew onto a heading of 260°. His plan was to track the B737 to the W of the conflicting ac, which were heading E at the time and then turn the airliner S towards BKY when clear of the other traffic. He called London MILITARY on the landline to initiate co-ordination but, when contact was established with Controller 11 (CON 11), he was advised that the other ac were not yet on CON 11's frequency and so co-ordination could not be agreed. The conflicting ac then turned N. Further avoiding action turns onto 270° and 300° were given and he rang Lakenheath to attempt co-ordination to be told that the ac were no longer on their frequency. By this stage he was concentrating his attention on the B737 to give accurate traffic information on

the conflicting ac, as the heading instructions given were in his opinion the best avoiding action that he could give in the circumstances. London MILITARY eventually called back and co-ordination was effected, but not before vertical separation had reduced to 5-800ft and 2-3nm horizontally. This was then rapidly restored as he had stopped the climb of the B737 at FL 150. He added that he had attempted co-ordination in, what he believed was sufficient time. However, despite contacting the London MILITARY controller who was assigned the squawks and had allocated them to the observed conflicting traffic, he experienced difficulty in concluding co-ordination.

THE B737-400 PILOT reports that they were unable to file a comprehensive Airprox report because they did not see the other ac at all. Neither was a TCAS RA nor TA enunciated. After take-off from Norwich they proceeded as instructed to BKY VOR and climbed to FL200 under he thought a RCS from Norwich ATC. Norwich requested them to execute some avoiding action manoeuvres and to maintain a FL just when they had passed through it. When he requested traffic information, the controller informed him that the other traffic was a military ac

that was not under control from Norwich. He did not comment on the inherent risk.

THE PILOT OF F15C 'B' reports he departed from RW06 at Lakenheath IFR, under a RIS from Lakenheath DEPARTURES (RAPCON 2). The HISL was on. Though flying 'out of the sun' he did not report visual contact with the B737, he thought, and provided no further narrative.

THE PILOT OF F15C 'A' was operating independently of 'B' at the time of the Airprox, but was not advised of the report until some 2 weeks after the event. The HISL was on. He was in receipt of a RAS, he thought, from London MILITARY and he did not report visual contact with the B737 either. The report submitted was of the same brevity as F15 'B'.

MIL ATC OPS reports with RT transcript that the first of two F15 ac - F15 'A', departed Lakenheath at 1234:05, and once identified by the Lakenheath RAPCON 2 controller (RAPCON2) in conformity with the pilot's request the ac was placed under RIS. The pilot asked to level at FL100, followed by further climb later. At 1235:33, the second F15 - F15 'B' - departed Lakenheath and RAPCON2 confirmed that both F15 'A' and F15 'B' were operating as two separate independent units. The controller issued the pilot of F15 'A' a L turn onto 090° to remain clear of CAS and commenced a handover to London MILITARY CON 11 at 1236:20, at which point the ac was 10nm SE of Lakenheath. During this handover the pilot of F15 'B' called RAPCON2 on departure using an incorrect callsign and requested "...a left turn direct heading 360° when able". The controller advised F15 'B' at 1236:35, "[C/S F15 'B'] radar contact maintain...FL90 [C/S F15 'A'] is level FL100 you're under RIS", whereupon the pilot acknowledged, "level 90 for [C/S F15 'B']". The handover continued to CON 11 "OK [C/S F15 'A'] is going to maintain FL100 for the moment then he's going to climb to 230". At 1236:52, CON 11 confirmed the type of ATS as a RIS and elected to "...take the other one [C/S F15'B'] off you if you want". At this point the handover became a little confused. RAPCON2 specified, erroneously, that F15 'B' was under his radar vector of 090° to remain clear of CAS but "...requesting to go direct Coningsby when able". RAPCON 2 added "you want me to take him direct Coningsby or just leave him"? CON 11 replied that a turn onto a heading for Coningsby would be "...fine they are going

direct Coningsby for a PD aren't they?" Erroneously, RAPCON2 specified they were, the handover conversation was concluded at 1237:17, when CON 11 advised RAPCON2, "Radar Information squawking 6113, I'm happy for both tracks if you keep their height restrictions on to turn direct Coningsby and identified..." whence the sector contact frequency was passed for both ac. At 1237:26, RAPCON 2 instructed F15 'A' to "...proceed direct Coningsby" followed by an instruction to the pilot of F15 'B' to do the same. However, the pilot of 'B' advised at 1237:38, that he was "...not proceeding Coningsby" but instead "proceeding the Wash approximate heading 350", whereupon RAPCON2 agreed the turn on course. At 1237:46, RAPCON2 asked the pilot of F15 'B' to "...confirm maintain 9000 [ft]" followed immediately at 1237:51, with "[C/S F15 'B'] [C/S F15 'A'] traffics east your position 8 miles at FL100". Only the pilot of 'A' acknowledged this call and at 1238:02, F15 'B' was advised that "....once you are diverging I'll get you higher". This was acknowledged by the pilot of F15 'B' who at 1238:13, was instructed by RAPCON2 to "...climb and maintain FL230 traffic's no factor". Both pilots were then released to call London MILITARY CON 11 in turn.

Meanwhile, as CON 11 completed the handover with RAPCON2, Norwich called London MILITARY for co-ordination. As the F15s were not yet on frequency, CON 11 could only advise at 1237:47, "just about to join my frequency the co-ordination I can give you is both tracks not below FL90", and added at 1237:52, "that's all I [CON 11] can guarantee at the moment". Norwich responded "...I'll have to avoid at the moment...I'm trying to get to BARKWAY climbing to 200". CON 11 advised that ..they're in a left turn...I'll call you [the B737] in and try and vector them clear of there they've not joined my frequency yet". At 1238:45, F15 'A' was identified by CON 11 at FL100 and placed under a RIS, followed by F15 'B' whose pilot reported at 1238:52, "[C/S 'B'] with you OK up to FL230 direct to the Wash". CON 11 identified F15 'B' at 1239:00, instructing the pilot to "...climb 230..." and in the same transmission immediately passed traffic information "...right one o'clock 3 miles right to left FL125..." – the B737. F15 'B' advised at 1239:06, that he was "...through 125", so CON 11 recalled the traffic at "...12 o'clock 3 miles right to left 100ft below", whereupon F15 'B' reported "...visual". Norwich called CON 11 via landline at

AIRPROX REPORT No 216/02.

1239:34, and advised *"..I'm trying to avoid you [F15 'B'] at the moment"* to which CON 11 responded *"OK I can guarantee now [C/S F15 'B'] not below FL140 and [C/S F15 'A'] maintaining FL sorry my 6114 maintaining FL100"*, which was clarified using the squawks again a little later. Norwich responded *"...I'll stop at 15 now cos' I'm there can I have not below 160 shortly"*, which was agreed by CON 11. Thereafter, F15 'A' was handed over to Coningsby and F15 'B' was released for general handling in the Wash.

Analysis of the Debden radar recording shows F15 'B' E of Lakenheath turning towards Honington, while F15 'A' is to the E of Honington at 1236:52, tracking E. At a position 2nm NE of Honington F15 'B' started turning inside F15 'A' – that was heading SE - and the B737 15nm NE of Honington. At this point F15 'A' is maintaining FL100, F15 'B' passing FL66 in the climb beneath the B737 passing FL76. F15 'A' commenced a L turn at 1237:46, onto a northerly heading with F15 'B' also in a L turn, still inside 'A'. As F15 'B' rolled out of the turn at 1238:11 - passing FL83 - the B737 is R 1 o'clock-8nm passing FL104. At 1238:40, the B737 can be observed to turn R, (avoiding action) and is in F15 'B's R 1 o'clock - 4½nm. At this point F15 'B' is passing FL102 some 1300ft below the B737 passing FL115 Mode C. CON 11's TI at 1239:00, correlates almost exactly with the recording; the B737 is in F15 'B's R 1 o'clock - 3nm passing FL124 in the climb. Although the pilot reported *"...through 125"*, F15 'B' indicated FL122 probably due to radar data lag as the next sweep shows the ac passing FL128 then FL133. As the ac close F15 'B' continues to out climb the B737 eventually passing 1.63nm astern at 1239:42, 700ft above the airliner.

Although CON 11 instructed RAPCON2 to maintain FL100 and FL90 respectively, with F15 'A' & F15 'B' during the handover, it was not specified by CON 11 that this was for any form of co-ordination. Indeed, though co-ordination was offered it was not subsequently agreed and only traffic information had been given to Norwich who was advised that the F15s would not fly below FL90. The instruction to *"...keep their height restrictions on to turn direct Coningsby..."*, which was complied with, therefore, this conversation has little bearing on the F15s' subsequent climb. Both jets were under a RIS with RAPCON2 and the traffic information passed to F15 'B' appears to be about F15 'A' and no mention is made of the

B737. When F15 'B' is released to climb by CON 11 at 1239:00, the B737 is R 1 o'clock at about 3-8nm. Under RIS the pilot is *"...wholly responsible for maintaining separation from other aircraft whether or not the controller has passed traffic information"*. A duty of care existed and it is disappointing that RAPCON2 did not pass traffic information about this obvious confliction with the B737. The prompt traffic information passed by CON 11 immediately the pilot of F15 'B' came on frequency is commendable, however; if RAPCON2 had provided an earlier warning it might have enabled the pilot of F15 'B' to expedite his climb above the B737 and prevent the confliction.

ATSI reports with RT transcript that the B737 departed Norwich to take up a south-westerly track for BARKWAY VOR and established communication with the Norwich APPROACH Radar controller (APR) at 1235. The B737 was identified and the flight placed under a RAS. However, the controller did not inform the crew of their position, nor request a read back of the radar service they were receiving, both of which are required in accordance with MATS Part 1.

Soon after the B737 was airborne, the APR telephoned the London Military ALLOCATOR to establish the intentions of two ac manoeuvring SW of Norwich squawking codes assigned to London MILITARY CON 11. Whilst waiting for the ALLOCATOR to take the landline call, avoiding action and traffic information was passed to the B737 crew just before 1237, *"...avoiding action turn right heading 260° traffic south-west range of 15 miles at the moment it's manoeuvring but on your track...blocking your level at the moment"*. There was no response from the crew initially [the APR had not used the full callsign and did not use the 'current phraseology'] and at that time the two F15s were turning L onto a northerly course - F15 'A' indicated FL100 and F15 'B' was climbing through FL40. The APR reiterated his avoiding action instructions, but again did not use the B737's full callsign. The B737 crew queried if the message was addressed to them, when this was confirmed just before 1237:30, the B737 crew read back the heading instruction. This delayed the effectiveness of the avoiding action turn. CON 11 then came on the telephone line and advised that although the F15s were displaying 'his' SSR codes, the ac were not yet on his frequency. Accordingly, the best co-ordination that could be

offered was "...both tracks not below FL90". The two F15s were now to the S of the B737 and turning northbound towards it. The APR had instructed the B737 crew to turn R progressively from a south westerly heading, onto 260° then 290° and finally onto 090° at 1238:30. The B737 crew queried the other traffic's altitude whereupon the APR advised "...I can't co-ordinate at the moment they're FL110 [&] FL100 manoeuvring south of you 3 miles stop turn now heading 300°", whereupon the B737 crew reported they were passing FL130 on the specified heading of 300°. The APR then tried telephoning Lakenheath for co-ordination, but by that time the F15s had been transferred to London MILITARY CON 11, who at 1239:32, called the APR back. At 1239:47, the APR instructed the B737 crew to "stop climb FL 150" and advised CON 11 during a co-ordination conversation, "OK I'll stop at 150 now cos I'm there can I have not below 160 shortly" [against F15 'B' as 'A' was no longer a factor] which CON 11 subsequently agreed at 1240:02, whereupon the landline call was terminated. Meanwhile, at 1239:42, F15 'B' passed just over 1.5nm astern of the B737 and some 700ft above it. The B737 was subsequently turned L towards BKY and, when clear of the F15s, climbed to FL200.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board noted that the Norwich APR had been concerned at his inability to contact the relevant controller to effect co-ordination. The allocation by LATCC (Mil) of SSR Mode A squawks to military fast-jet ac before departure, so that they are transponding their code throughout the departure, but before contacting the London MILITARY controller, is a long established practice. The rationale behind this controversial SOP is that it allows the pilot to concentrate on flying the departure profile and is one less distraction for him, which is especially beneficial in single seat high performance jets as here, where pilots are subject to a very high workload. The Mil ATC Ops advisor briefed the Board that a study had been conducted into this topic by HQ STC

Ops Support Staff. The overarching principle is that if the ac will be retained on the terminal ATSU's frequency for more than 2min from departure, then the terminal unit's squawk should be used before asking pilots to select the London MILITARY code prior to the handover. Whereas for shorter periods than this, the London Military code can be selected on departure from the outset. Here it appeared that there had been a significant delay between the departure, the radar handover being effected and the pilots finally being instructed to switch frequencies to CON11 - about 1½ min from the end of the handover conversation until the pilots achieved two-way com

Meanwhile the APR had been trying to ascertain whom he could achieve co-ordination with and RAPCON 2 had not passed traffic information about the B737. From the RT transcript it was evident that RAPCON 2 and CON 11 had conscientiously taken care to ensure that the two F15 ac (operating independently of each other) were afforded appropriate separation of 1000ft between them and were aware of each other – even though they were only receiving a RIS at the time. This, the Board was advised, was what CON11 was referring to, when he specified to RAPCON 2, "...keep their height restrictions on..." during the handover. However, CON11 did not point out the B737 to RAPCON 2, neither did the latter pass traffic information about the B737. The airliner should have been plainly apparent to both controllers as a potential confliction once the F15s were turned northbound and members agreed that if RAPCON had passed traffic information earlier the pilot of F15 'B' could have been pre-warned about the confliction and would have been able to give the B737 a wider berth. The HQ 3AF advisor explained that the controller thought he had called the traffic at the time, but that was plainly not the case.

Although CON11 had proposed to the APR that he might "...try and vector them clear..." the Board was advised that he would have had little intention of undertaking this under the RIS and he had not intended to stop off the F15 below the climbing B737. Others contended that the F15 pilot probably would have complied with any appropriate control instruction that CON11 may have chosen to issue; notwithstanding the extant RIS, 'good practice' suggested that positive action was warranted to keep the airliner and F15 'B'

AIRPROX REPORT No 216/02.

apart. The Mil ATC Ops advisor explained that it would have been preferable if CON11 had passed traffic information about the B737 first - before reaffirming the climb to FL230 - as soon as the pilot called. A request to expedite the climb would also have been beneficial. As it was, it was too late to stop off F15 'B' below the B737 by the time the conflict was first pointed out to the pilot of the fighter at a range of about 3-8nm. Some pilot members thought this was far too late to be informed about conflicting traffic for the first time under a RIS. Nevertheless, the Mil ATC Ops advisor commended CON11 for his action and some controller members thought that the F15 could outclimb the B737 with ease. But it was not until after the Airprox had occurred that co-ordination was achieved and CON11 was aware that the B737 was being stopped off at FL150 by the APR. Members agreed that the Norwich controller had recognised the conflict and initiated action to try and resolve it in good time, but he had been unable to achieve the requisite separation despite trying hard to sort out the situation. However, the B737's climb could have been stopped earlier below both F15s, but at that stage the APR would not have known that 'B' would be climbing higher. As it turned out separation ahead of 'A' was achieved, but the airliner passed only 700ft below F15 'B' as it flew 1.63nm astern of the B737. The STC fast-jet pilot member suggested that the F15 pilots might well have been expecting more from ATC under the RIS than the controllers

might, as a matter of course, provide. Whereas, others suggested that the pilot of F15 'B' might have been able to achieve a greater degree of vertical separation, because he was solely responsible for maintaining separation against other traffic. A controller member asked if the B737 would have been shown on the F15's radar, but it was explained that the pilot could recall little of the event and at that point, without any pre-warning the radar might not have been set to 'Air - Air Mode'. Nonetheless, the absence of traffic information from RAPCON 2 had been a contributory factor. The Board concluded after considerable debate that the cause of this Airprox was a conflict in the FIR, between the B737 flying under IFR and F15 'B'. That the latter's pilot had sighted the jet, albeit at close range, and could have afforded greater separation if need be, convinced members that no risk of a collision had existed in these circumstances.

PART C: ASSESSMENT OF CAUSE AND RISK

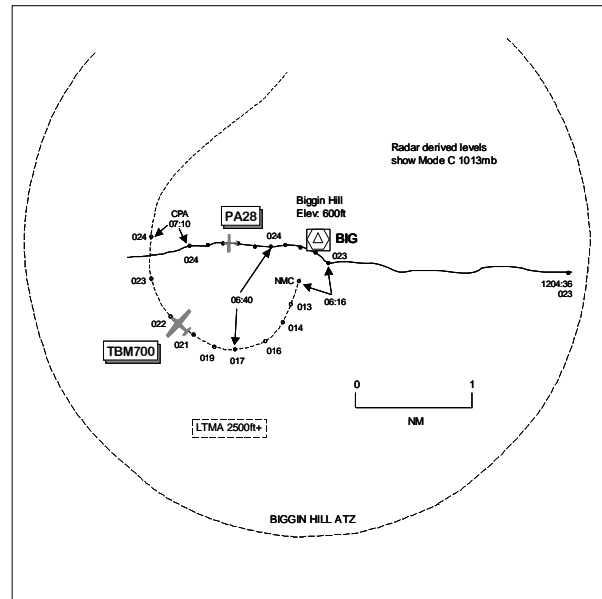
Cause: Conflict in the FIR.

Degree of Risk: C.

Contributory Factor: RAPCON did not pass traffic information to the pilot of F15 'B' about the B737.

AIRPROX REPORT NO 218/02

Date/Time: 8 Nov 1207
Position: 5120N 0001W (1.5nm W BIG - elev 600ft)
Airspace: ATZ (Class: G)
Reporting Aircraft *Reported Aircraft*
Type: TBM700 PA28
Operator: Civ Pte Civ Pte
Alt/FL: 2000ft↑ 2300ft
 (QNH 1008mb) (RPS)
Weather IMC KLWD IMC CLOC
Visibility:
Reported Separation:
 nil V 700ft V 800m H
Recorded Separation:
 nil V 0.33nm H

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

THE TBM700 PILOT reports flying an IFR departure from Biggin Hill RW21 at 140kt in IMC. The ac was coloured white/blue, his landing and strobe lights were switched on and he was squawking an assigned code with Mode C. After initial RT contact with Thames Radar on 132.7MHz and whilst climbing through 2000ft QNH 1008mb and turning through a north-westerly heading, his 'Skywatch' TCAS enunciated 'traffic'. Although he was TCAS trained it took a little time to work out what the display was showing, as the conflicting traffic was superimposed over his ac symbol and indicating the same level. He continued his climb without ever visually acquiring the conflicting traffic and assessed the risk of collision as high.

THE PA28 PILOT reports tracking 268° inbound to OCK at 110kt and 2300ft RPS and being in receipt of a RIS from Farnborough on 125.25MHz. He was flying solo in IMC, 200ft above and 0.2nm horizontally from cloud squawking an assigned code with Mode C. His ac was coloured white with orange wingtips and his anti-collision light was switched on. He was under a high workload, having just finished 2 way communications with Southend, having been receiving a RIS, he thought, and had immediately contacted Farnborough to request a RIS, which had taken

his mind off the fact that he was transiting through the Biggin Hill ATZ. He had visually acquired traffic, in his 10 o'clock range 0.5nm which crossed L to R in level flight, estimating it to be at 3000ft when it passed through his 12 o'clock range 800m. Although it was close, he had maintained visual contact with it throughout, although the hazy weather conditions combined with distortion owing to condensation on both the L and R windows may have caused poor judgement of distances. Just after sighting the traffic, he thought it was a TB10 ac coloured white with a black stripe, Farnborough ATC passed TI on the same ac. He thought there had been no risk of collision. Farnborough later asked him if he had received clearance through the ATZ, at which point he realised what he had done. Having mistaken BIG as being only a VOR, had led him to believe that he could proceed in accordance with his flight plan, not taking into account the position of the nav aid on the aerodrome. With hindsight, he should have paid more attention, at the planning stage, to the airspace environs, as at the time of the incident he was being very cautious not to infringe the London TMA above his route in the poor weather conditions. He apologised for entering the ATZ without specific clearance and had learnt many lessons from his mistake.

AIRPROX REPORT No 218/02.

ATSI comments that the PA28 contacted Southend Approach requesting a RIS. The ac reported maintaining 2000ft, IMC and, subsequently, passing DET for BIG. As radar was not available the pilot was given the option of a FIS with Southend or a transfer to Thames. The pilot opted to remain on the Southend frequency under a FIS. Apart from being passed a new QNH, no further contact was made with the PA28 until the pilot requested to change frequency to Farnborough at 1204:40, by which time the ac had entered the Biggin Hill ATZ. It might be argued that, having received a report from the pilot that he was routeing via the BIG VOR at 2000ft, the Southend Controller could have taken a pre-emptive role and ensured that the flight was transferred to another ATC agency that could provide a service either to approve entry into, or suggest action to remain clear of, the Biggin ATZ e.g. Biggin Hill, Thames or Farnborough. Nevertheless, it was the pilot's responsibility to ensure that he complied with Rule 39 (Flight within aerodrome traffic zones).

On contacting Farnborough, the PA28 was identified 0.5nm W of BIG and passed TI (shortly after 1207) on an ac in his 10 o'clock position, range 0.5nm tracking NW indicating 2200ft (the TBM700). The pilot reported it in sight.

The TBM700 contacted Thames Radar, at 1206:50, after departure from Biggin Hill, at about the time the pilot received a TCAS alert (on the PA28). The controller reported that he had no knowledge of conflicting traffic and the labels of ac in the vicinity of BIG were 'garbling' at the time. It is considered that both Farnborough and Thames Controllers reacted appropriately in the circumstances.

UKAB Note (1): The Biggin Hill METAR was EGKB1150Z 21017KT 2500m S RA SCT004 SCT006 BKN010 08/07 Q1008.

UKAB Note (2): Analysis of the Pease Pottage recorded radar at 1204:36 shows the PA28 2.3nm E of Biggin Hill squawking 7000 tracking 270° indicating FL023 (2150ft QNH 1008mb). At 1206:10, the squawk changes to 0434 (a Farnborough SSR code). Six sec later as the PA28 passes overhead BIG indicating FL023 (2150ft QNH), the TBM appears on radar 0.4nm SSW of BIG just airborne from Biggin Hill RW21 showing NMC; on the next radar sweep the TBM

is indicating FL013 (1150ft QNH). At 1206:40 the TBM700 is turning R through a westerly heading indicating FL017 (1550ft QNH) in the PA28's 10 o'clock position range 0.4nm, 700ft below it. The TBM's R turn is continued until the CPA is reached at 1207:10, when it has just crossed 0.33nm ahead of the PA28 indicating FL024 (2250ft QNH), at the same level.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The discussion opened on the piloting aspects of the incident. Firstly, although the TBM700 pilot was TCAS trained, the relative positions of the subject ac were not clear at first from the 'Skywatch' equipment; the 'superimposition' of the traffic symbol over his own one may have been a function of the selected display range at the time. In any event, when presented with a 'traffic' alert indicating the same level without the benefit of a 'resolution advisory', with limited time to assimilate the situation whilst flying 'unsighted' in IMC he had elected to continue his climb. Some thought this was 'brave' while others thought there was little else that he could have done in the circumstances described. Secondly, it was apparent from his report that the PA28 pilot did not appreciate the type of service he was under from Southend (a FIS, not a RIS). He had then left their frequency to call Farnborough for a radar service, forgetting the Biggin Hill ATZ ahead and the need to contact an appropriate ATSU in good time to request permission to enter it. Irrespective of workload at the time, members were critical of the PA28 pilot's pre-flight planning as the airspace/navaids information is readily apparent on 1:250,000 and 1:500,000 charts. Members were clear that the Airprox was caused by the PA28 pilot entering the Biggin Hill ATZ without permission and then flying into conflict with the TBM700 in IMC.

The Thames Radar controller had given a radar release to Biggin Hill for the TBM's IFR departure but the developing conflict was not apparent to him owing to a number of ac labels garbling in the

BIG hold. The TBM700 pilot reported the incident, shortly after making his initial call on the Thames frequency, but had not visually acquired the PA28 at all owing to IMC. A similarly 'cluttered' picture would have been presented to the Farnborough LARS controller, who had eventually identified the PA28 just to the W of the BIG VOR within the ATZ and had passed TI, on the TBM, to its pilot. Although the PA28 pilot said he had seen the TBM shortly before the Farnborough TI call, even though he was also flying in IMC, the recorded radar had presented a different picture. On the recording the TBM had crossed 0.33nm ahead of the PA28's track, almost at 90°, but at the same level and not above as reported. Although the late

visual sighting had ensured that the subject ac were never going to collide, the Board agreed that the passing distances in IMC had been purely fortuitous and that the safety of both ac had not been assured during the encounter.

PART C: ASSESSMENT OF CAUSE AND RISK

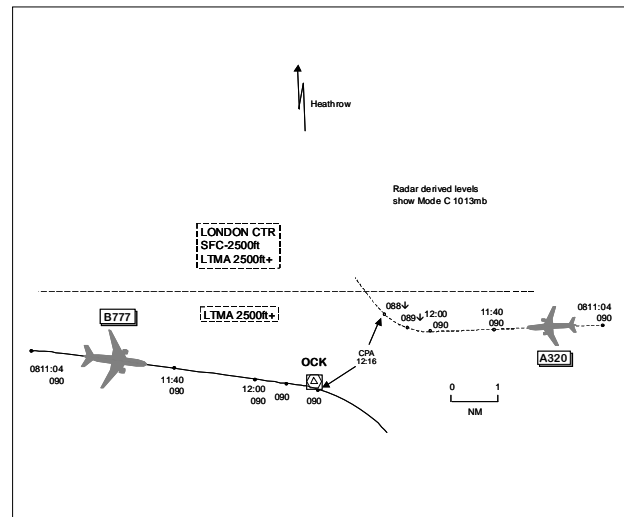
Cause: The PA28 pilot entered the Biggin Hill ATZ without permission and flew into conflict with the TBM700 in IMC.

Degree of Risk: B

AIRPROX REPORT NO 219/02

Date/Time: 10 Nov 0812 (Sunday)
Position: 5119N 0026W (1nm NE OCK)
Airspace: TMA (Class: A)
Reporting Aircraft Reported Aircraft
Type: A320 B777
Operator: CAT CAT
Alt/FL: FL90 FL90

Weather IMC NK IMC KLWD
Visibility: NK 3km
Reported Separation:
 200ft V 2nm H 2-3nm H
Recorded Separation:
 200ft V 2.2nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE A320 PILOT reports heading 275° at 220kt and FL90 in IMC following vectors towards RW09L from Heathrow Approach on 119.72MHz. On his nav display he saw TCAS traffic flying in the opposite direction at the same level. When the separation reduced to 5nm, a TA warning was received and he called ATC to advise them of the traffic. He was given a turn onto 340° and told to descend to FL80, which he complied with, and the other ac was seen on TCAS to pass 2nm clear to his L and 200ft above. He assessed the risk of collision as high.

THE B777 PILOT reports heading 090° at 210kt and FL90 in IMC inbound to Heathrow. He was given a R turn by ATC to avoid traffic whilst TCAS gave a TA warning; the other ac was seen on his display to pass 2-3nm clear to his L with a low risk of collision.

ATSI reports that at the time of the Airprox, both ac were under the control of the Heathrow Intermediate Director. The controller was working both the North and South Intermediate positions in a 'band-boxed mode'. The controller

AIRPROX REPORT No 219/02.

had accepted this position some 8 min earlier when, by reference to the long range radar, he estimated that there was relatively little traffic due in the immediate future.

Shortly after he had taken the position, there was a go around from RW09L at Heathrow (AC3) rapidly followed by another ac (AC4), having declared a PAN, requesting an immediate return to Heathrow owing to smoke in the cockpit. This combination of events significantly increased the controller's workload.

The radar director was operating the four holding stacks for Heathrow. His strip display was arranged with the fpos placed below the relevant stack designator. The A320 called the controller at 0806:20, and reported inbound to BIG, descending to FL90. The crew were instructed to leave BIG heading 275° and to maintain a speed of 220kt; this was correctly acknowledged.

The subject A320 was being sequenced behind an A321, which had also left BIG on a westerly heading, maintaining FL80, and positioned some 10nm ahead. At 0807:50, shortly before the A320 had reached BIG, the ac that had carried out a go around from 09L, AC3, called on frequency. The crew were given headings to position for a LH cct and climbed to 4000ft. At 0809:10, AC4 came on frequency requesting a priority return to Heathrow. As soon as the controller was aware of this emergency, arrangements started to be made to 'split' the position into Intermediate North and Intermediate South Directors. AC4 was instructed to descend to 4000ft, which would have put it into conflict with AC3, but the controller, quickly recognising his error, corrected the descent clearance to 5000ft.

The A320 had now left BIG and was maintaining a westerly track towards OCK level at FL90. Inbound to OCK, but not yet on frequency, was the B777 descending to FL90. At 0809:40, the two ac were on reciprocal tracks at a range of 25nm. The B777 had been instructed to contact the Intermediate Director at 0810:12, and the crew correctly read back the frequency of 119.72MHz. However, they reported back on the TC Ockham Sector frequency at 0811:04, stating "*.....nobody at home on 119.32*". The crew were, once again, instructed to change frequency to the Intermediate Director and established

communications with him at 0811:59, less than 2nm from OCK.

During the confusion regarding the frequency change, colleagues around the room had alerted the Intermediate Director to the conflict between the two ac at OCK. Almost coincident with STCA activating at 0811:40, the A320 reported traffic on its TCAS 5nm ahead. The controller, who had already recognised the problem and was trying to issue instructions on the RT, then transmitted to the A320 pilot "*A320 c/s turn right heading three four zero descend flight level eight zero*". The crew of the A320 read this back and immediately thereafter the B777 reported on frequency and was, in turn, instructed to turn R heading 180°; this was correctly acknowledged.

At the time the B777 reported on frequency, the A320 was in its 11 o'clock at a range of 4-5nm. As both ac started their respective turns, and the A320 commenced descent, separation reduced to a minimum, at 0812:16, of 200ft vertically and 2.2nm horizontally. Standard separation was restored shortly afterwards.

The controller later advised that, when he took over the position, the workload and traffic levels were both light but soon increased. Once it was known that an emergency, AC4, was in the system, arrangements were made for the position to be split. Unfortunately, this action occupied the Support controller at a time when her attention to the traffic situation would have been preferable. With hindsight, the Intermediate Director advised that he believed it would have been better to retain the band-boxed mode until such time that the emergency ac had been transferred to the Final Director's frequency.

The controller had planned to follow the almost standard procedure, when Heathrow were on easterly operations, and that was to take traffic from the BIG hold, route it under the OCK stack before turning base leg for RW09L. The A321 ahead of the A320 was at FL80 and the minimum holding level at OCK was FL90. As in the case of the A321, the normal procedure is to issue a descent clearance to ac cleared to leave BIG to ensure that they are below ac holding at OCK. Additionally, once the ac is clear of the BIG stack, the fpos is normally moved to under the OCK designator to highlight any potential conflicts.

On this occasion the controller had done neither. He had not instructed the A320 to descend to FL80 and he had not moved the strip to under the OCK designator, but was at a loss as to why. It was clear that in dealing with both the go around and the returning ac, his attention had been captured for a spell by traffic operating N of Heathrow. Once AC4 was transferred to the Final Director's frequency, however, the Intermediate Director turned his attention back to the OCK and BIG traffic. He saw the problem but was prevented from taking effective action as ac were calling and so he could not transmit on the frequency. He did not use the words '*avoiding action*' because the crew had already reported a TCAS contact on the B777 and the most effective way of dealing with this was to instruct the A320 to turn and descend. With hindsight, the controller accepted that using the words '*avoiding action*' might have engendered a quicker response from the crew.

The frequency selection error by the crew of the B777 added to the problems of the controller. Traffic is generally transferred from the TC Ockham Sector to the Intermediate Director when it still has some distance to run to OCK. When the B777 pilot was instructed to call the Heathrow Director, the ac was approximately 12nm W of Ockham and 20nm from the A320. However, this separation had eroded to 2nm from OCK and 4.5nm from the A320 by the time the B777 crew eventually established communications. If the frequency change had been accomplished sooner the developing conflict might have been picked up earlier.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members agreed that, with the benefit of hindsight, the situation could probably have been better handled. The decision to split the Sector during the period of the Heathrow go-around and PAN call, had occupied the Support controller's attention when it could have been put to better use by monitoring the situation and assisting the INT

DIR controller in 'man and boy' mode. Indeed, ATCOs agreed with the INT DIR's comments that the splitting of the sector should have occurred after the PAN traffic had been transferred to the FIN DIR's frequency. One ATCO questioned the roles played by the Group Supervisor (GS) and Traffic Manager (TM), and whether it had been appropriate for the Sector to be 'bandboxed' at the time. No reports had been secured from the Ops Room Managers although the NATS advisor had a report stating that traffic levels were light to moderate at the time; it was believed that the Group Supervisor and Traffic Managers' positions were also bandboxed. Information from the supervisory staff would have shed light on the decision making process which had been followed, particularly what consideration had been given to the support of the controller who had been faced with a rapid increase in workload immediately prior to the Airprox. Undoubtedly, the INT DIR's routine had been interrupted by AC3 and AC4 calling on frequency, both of which required immediate remedial action. However, he had given the A320 a radar heading from BIG at FL90 but he had not given it descent to FL80 to pass beneath the B777 which was entering the OCK holding stack at the same level. This had caused the Airprox.

The INT DIR had been warned of the confliction by his colleagues just prior to STCA activating and the A320 crew giving an RT alert. However he was prevented from giving immediate resolution instructions owing to a succession of ac transmissions. Members commended the A320 crew's situational awareness and actions and for calling the conflicting traffic, the B777, to ATC, post TA warning. The A320 crew complied with the turn and descent instruction and watched the traffic on TCAS pass abeam to their L by 2nm, 200ft above. ATCOs believed that had the B777 crew called earlier on frequency, it would almost certainly have prompted the INT DIR to notice the developing confliction earlier than he did. After their belated call, they had complied with the issued R turn and also watched the A320 on TCAS turn away at about 2-3nm range. Members agreed that the use of '*avoiding action*' phraseology was always recommended and has shown on previous occasions to engender quicker responses from aircrew. At the end of the day, these elements combined were enough to persuade the Board that any risk of collision had been effectively removed.

AIRPROX REPORT No 220/02.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Whilst dealing with a go-around and a PAN call, the Heathrow INT DIR vectored the A320 into conflict with the B777.

Degree of Risk: C

AIRPROX REPORT NO 220/02

Date/Time: 12 Nov 1549

Position: 5532N 0200W (12nm SE of Coldstream)

Airspace: UKDLFS - LFA12 (Class: G)

Reporting Aircraft Reported Aircraft

Type: Tornado F3 Harrier GR7

Operator: HQ STC HQ STC

Alt/FL: 750ft 250-300ft
(Rad Alt) (Rad Alt)

Weather VMC CLOC VMC CLOC

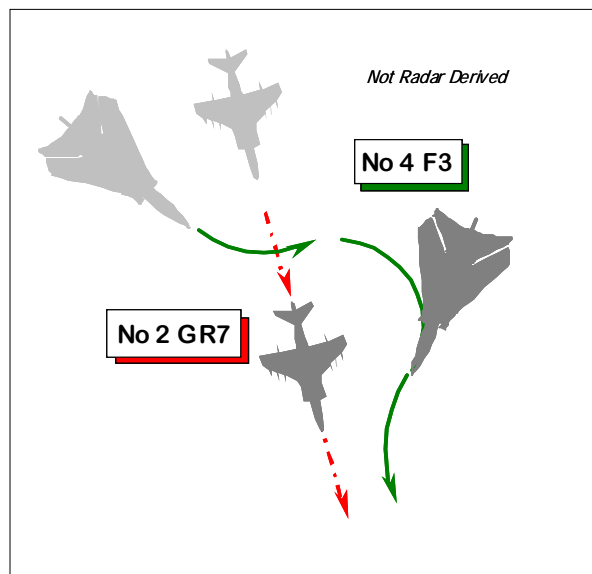
Visibility: 20km+ 20-30km

Reported Separation:

100ft H, 100ft V 300ft V

Recorded Separation:

Not recorded



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE TORNADO F3 PILOT provided a laudably frank and honest report, stating he was flying as the No4 of a four-ship F3 formation within LFA12. His ac has an air defence grey camouflage colour scheme, but the HISL was on. A squawk allocated by CRC Buchan was selected with Mode C, from whom he was receiving an Air Defence Information Service (ADIS); neither TCAS nor any other form of CWS is fitted. Together with the No3, he was set up at the northern end of Operational Training Area (OTA) C acting as a low level target for Nos1 & 2, to the S, who were acting as fighters during this low-level sortie.

During this run Nos 3 & 4 were flying at 750ft agl heading 145° in 2–3nm trail against the northbound 'fighters', in good VMC some 5000ft below cloud with an in-flight visibility in excess of 20km. He was 'spiked' [locked-up by a fire control

radar] and so to counter the threat 'notched' to the E [a tactical manoeuvre to defeat the radar lock] by breaking L, quickly clearing the flight path and then concentrating his attention back to his 3 o'clock to gain tally with the No 1 & 2 'fighters'. This was quickly achieved and a climbing break to the R was executed to engage the fighters. During this breaking turn a Harrier GR7 was suddenly spotted through the right quarter light at low 1-2 o'clock at close range – about 200ft away. To avoid the GR7 he rolled wings level as the Harrier passed 100ft below his ac and about 100ft away. As the flight paths crossed, his F3 was climbing through 750ft Rad Alt in the R turn at 460kt, whereupon he called "knock it off" to the rest of the formation. He assessed that the risk of a collision was "medium to low" and he thought averted only by his climbing break, but that was not why it had been executed. The Harrier pilot waggled his wings to acknowledge the presence

of his F3, but he was unsure if the GR7 pilot had seen his jet before their flight paths crossed or after the climbing break, which was only executed due to the 'fight' with the Nos 1 & 2 and not with the purpose of avoiding the GR7. He cited his concentration on searching for the No1 & 2 out to starboard as a significant factor.

THE HARRIER GR7 PILOT reports he was flying as the No2 of a pair of GR7s in good VMC on a bounced low-level sortie with no low cloud and a visibility estimated at 20-30km. Flying at 250-300ft agl in 'Battle' formation to the R of his leader at about 1½-2 nm spacing, he was heading S, at 420kt just to the S of Millfield glider site, within OTA C. His formation was monitoring a tactical frequency.

An F3 was seen [possibly the No3 leading the pair] as it passed him high, heading south. Shortly afterwards he saw another Tornado, which was first spotted about 400 yd away as it overtook him on the R also southbound and passed from his 4 o'clock position to just in front of his ac on his 3-9 o'clock line. He estimated that the F3 had about 50kt of overtake on his Harrier and it was initially just above his ac, flying at about 500ft agl. When it was just forward of the beam, he saw the F3 break left, and cross above his ac from R - L, with about 300ft of vertical separation before its pilot then reversed the turn so it rolled out on an almost parallel track again to port. He explained that he did not feel threatened by the proximity of the F3 or its flight path and he learned of the Airprox report when he returned to base.

UKAB Note (1): This Airprox was not shown on recorded radar. The No4 F3 is shown occasionally but the tactical manoeuvres executed and the intermittent nature of the radar contacts do not allow the geometry of the encounter to be assessed with accuracy.

THE TORNADO F3 PILOT'S STATION COMMENTS that this Airprox is a reminder to us all that there can always be another ac in the area, in addition to the one we are fighting, and we cannot rely on procedural de-confliction in the OTAs.

[UKAB Note (2): The OTAs are booked at squadron level within 1Gp on a computerised system, which is available to the CRCs. The bookings are frozen 1 hour before use and are

prioritized on a cascade basis (from complex multi types with AWACS control down to simple 1-v-1 PI sorties). Other users of the OTAs, such as 3rd AF, will call on the OTA frequencies to co-ordinate with AD ac using the area. The CRCs are not aware of LFA bookings nor do they have access to the LFS frequency to co-ordinate with other users of the LFS.]

THE HARRIER GR7 PILOT'S STATION comments that the GR7 pilot would seem to have become visual before the F3, but the Harrier pilot could not have manoeuvred in any manner to alleviate the situation.

ASACS SSU comments that the Tornado F3 formation was in receipt of an ADS from CRC Buchan who provided reports from the respective Weapons Controller (WC), Fighter Allocator (FA) and Master Controller (MC) together with a tape transcript. Regrettably, the WC RT and the radar data recording equipment were unserviceable (this equipment failure is subject to an urgent request for manufacturer's investigation by CIS Engineering at Buchan). Consequently the transcript of events was collated from the data recorded on the supervisory FA and MC positions.

The weather in the operating area was reported by the No1 as a cloudbase of 2500ft rising to 3000ft above the hilltops, but with good visibility below. The No 1 & 2 F3s were operating under a 'Limited' ADIS 5000 [equating to a RIS above 5000ft and a FIS below this altitude]; whilst No 3 & 4 elected to remain on a Limited ADAS 5000 [equating to a limited RAS above 5000ft] due to the poor weather. The Airprox occurred 55min into the sortie with No 3 & 4 acting as low-level targets for Nos 1 & 2 as the fighters. At the time of the Airprox, the No 4 F3 was receiving a FIS from Buchan below 5000ft and thus the pilot was responsible for his own safe separation from other traffic. Two primary radars were available to the WC - the NATS Great Dun Fell Radar and an ASACS source. The former was providing a clean uncluttered picture, but no low level coverage of the operating area, whereas the latter was suffering from considerable clutter, mirroring and ring around within 15 - 20nm of the radar overhead - where the Airprox occurred. The WC was switching between the two radar heads to maximize his situational awareness and fulfil his obligations under the terms of the ADAS. The first

AIRPROX REPORT No 220/02.

clear indication that the WC had detected the subject Harriers was at 1549:25, when he transmitted to the fighters No 1 & 2, "...your target, bull 135, 9 miles, manoeuvring - Buchan - additional pair of bogies [the Harriers] north east of them by 3". The fighters then made a target aspect call between themselves before the WC transmitted at 1549:49, "[C/S] 3 & 4, Buchan, heads-up, co-level strangers north of you, 1 mile, battle pair". The next transmission by the No1 & 2 'fighters' indicated that they had not realised the significance of the information being transmitted to the No3 & 4 'targets' and themselves by the WC. Although the stranger warning to No 3 & 4 was late, there was an indication of traffic to the NE 3nm away, which should have triggered a visual search of that area for other ac. Given the terrain in this area and the poor radar performance, the WC performed particularly well to detect the Harriers at 250ft agl, more than fulfilling his obligations under the terms of the FIS that pertained.

HQ STC comments that the CRC Buchan WC did extremely well to call the two Harriers, but this information did not appear to register with the F3 crews. The CRC RT transcript reveals the No3 F3 detected the Harriers on AI radar 2½min before the Airprox occurred "[C/S] shows bogey heading south-west, now pair, Bull 325 6, low, fast". The WC replied "...Buchan holds a battle pair, heading south, bull 330, 3 miles, 500 feet". The F3s overtook the Harriers but did not see them, which leads to the notion that perhaps there was an over dependence on AI Radar and the ac's Radar Warning Receiver (RWR), that the F3 crews were largely 'heads-in' and that they did not assimilate the available information to build their situational awareness. This would illustrate yet again, that radar and other electronic means, cannot guarantee to illuminate all other traffic. To get a complete air picture, and build situational awareness, you must also look out. Interestingly, the No4 F3 never saw the lead Harrier, and the No3 F3 did not see either of the two GR7s.

This Airprox illustrates clearly how suddenly seeing another ac causes a greater feeling of risk, than when an ac is observed over a period of time, but still achieves the same separation distance.

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 defence controllers involved and reports from the appropriate Air Defence and operating authority.

This Airprox was a salutary lesson to air defence pilots on overtaking at low level without noticing the other ac. The STC member explained that the No4 Tornado F3 pilot was inexperienced and was not 'combat ready' at that stage. He was operating in a very demanding training scenario to improve his combat skills and it was evident that he was working hard with reduced capacity remaining to absorb what he was being told by both his section leader - the No3 F3 - and the WC about the GR7 pair. The CRC transcript and ASAC's investigation had revealed that traffic information had been provided by the WC about the 'stranger' Harrier pair approaching from the N, albeit at a fairly late stage. The Board agreed that the WC had acted commendably to warn the formation (effectively only under a FIS at the time), but the No4 F3 pilot appears to have been oblivious to the GR7's presence as he manoeuvred first to 'break-lock' and then re-acquire and engage the fighters. When pilots are operating under high pressure, it is well known that one of the first human senses to suffer reduced function is hearing and in this case the information on the GR7 pair did not register in his mind, or, if it did, its significance was not assimilated. From his laudably honest account it appeared to the members that he had concentrated on acquiring the No1 & 2 and the 'fight' to the detriment of an all round scan. This led him to break L over the top of the Harrier not realising it was there until he suddenly spotted it close-in below, just as he turned R again. During all of this the No2 GR7 pilot assumed, erroneously, that the No4 F3 crew had spotted him, as the latter overtook his ac. Members speculated what the Harrier pilot might have done if he had known at the time that the F3 pilot was executing these manoeuvres unaware of his ac. Clearly the overtaking ac must give way to the ac being overtaken – but that can only work if the overtaking pilot knows the other ac is there – so the lesson here is never assume he does. The Board concluded that this Airprox had resulted

despite a warning from the CRC, because the No4 F3 crew had not spotted the GR7 beforehand.

Although the GR7 pilot confirmed that he “did not feel threatened by the proximity of the F3 or its flight path” that was in ignorance of the facts, but he did well to spot it overtaking to starboard. Fast jet pilot members disagreed with the Harrier pilot’s unit and thought there was room for the No2 GR7 pilot to move away if the No4 F3 got any closer as it flew over the top. Furthermore, the F3 pilot had eventually spotted the other jet just in time to turn away from it as he tried to cross its path for the second time. This occurred in plain view of the

GR7 pilot, which coupled with the reported vertical separation at the time, led the Board to conclude that no risk of a collision had existed in the circumstances conscientiously reported here.

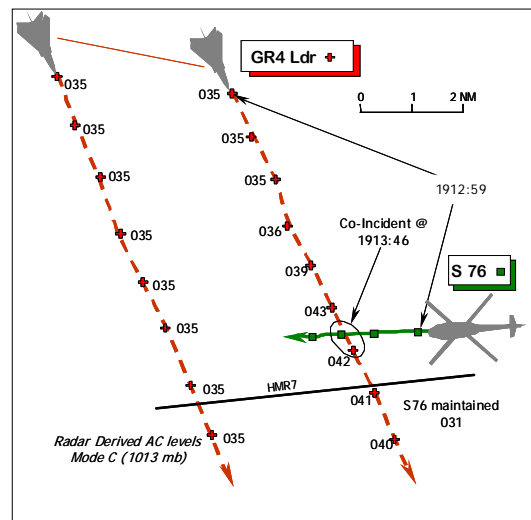
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Non-sighting of the No2 GR7 by the No4 F3 crew.

Degree of Risk: C.

AIRPROX REPORT NO 221/02

Date/Time: 12 Nov 1913 NIGHT
Position: 5341N 0039E (25nm E of Otringham)
Airspace: London FIR (Class: G)
Reporting Aircraft Reported Aircraft
Type: S-76 Tornado GR4pr
Operator: Civ Comm HQ STC
Alt/FL: 2500ft 3800ft
 RPS (989mb) (Rad Alt)
Weather VMC VMC SKC
Visibility: 30km 50km
Reported Separation:
 nil H, 400ft V <1nm H, 1000ftV
Recorded Separation:
 11-1200ft V - tracks crossed,



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE S-76 PILOT reports that he was inbound to Humberside from the E at 2500ft Humber RPS (989mb). He was in contact with ANGLIA RADAR and squawking the assigned code with Mode C, but TCAS is not fitted. He did not specify the form of ATS, but ANGLIA advised him of a fast jet pair 13nm to the N. Visibility was good and the beacons and nav lights of the pair were seen. The most easterly of the two jets appeared to be on a constant bearing, which concerned him and he asked ANGLIA for the best avoiding action. The controller advised that the best action was for him to remain on their current heading. The range and

closure rate of the conflicting ac was difficult to judge, but it appeared to climb suddenly and within a few sec flew directly over his helicopter "no higher than 400ft" above his S-76. He thought ANGLIA RADAR stated that the fast jet had climbed to 2900ft Mode C. He did not include any assessment of risk.

THE TORNADO GR4 PILOT reports he was leading a pair of Tornado GR4s recovering to Marham over the sea after a night low-level Terrain Following Radar (TFR) training sortie using Night Vision Goggles (NVG). A squawk of

AIRPROX REPORT No 221/02.

A7001 was selected with Mode C, but neither TCAS nor any other form of CWS is fitted. They were not in receipt of an ATS, but HISLs were on whilst flying in a clear sky with no cloud in VMC; the visibility through NVG was 50km. He did not specify a TAS.

Flight parameters during the sortie were accurately recalled by use of the on-board recording system. The pair was flying at 3000ft Rad Alt for the transit [above the UKNLFS and to clear an area of Helicopter Protected Zones (HPZs) ahead] on a south-easterly heading of 155° with about 3nm displacement between ac on a parallel track formation so as to give the No2 crew on his R experience of that disposition. CAS [L975 base level FL85] above the intended route precluded a significantly higher transit level. The flashing lights of the helicopter were first spotted at 1912:35, with the aid of NVGs and about 8nm before the CPA. He believed initially that his jet would pass ahead of the helicopter and well above it, but as the range reduced it became clear that this would not be the case, so a 2° avoiding action climb was executed up to 3800ft Rad Alt to increase the separation. This resulted in his ac passing just ahead of the helicopter at 1913:40, with <1nm horizontal separation and 1000ft above it. He added that aided by NVG and Forward Looking Infra-Red (FLIR) they had seen the helicopter over 1min before the CPA and had manoeuvred to stay clear of the S76. The TFR was also transmitting - but not engaged to the autopilot. The risk of a collision was assessed as "nil".

After taking positive action to avoid startling the helicopter crew, he did not consider that an Airprox had occurred, but after landing he was contacted by ATC who advised that the helicopter pilot had called and had queried if his helicopter had been seen. He confirmed that the S76 had been seen and explained the circumstances.

In hindsight he opined that perhaps he could have changed the routeing to avoid that area completely, they could also have contacted ANGLIA RADAR, or, they could have operated below 1000ft asl. But he stressed that they had been operating in excellent VMC in the "free airspace" of the open FIR.

THE TORNADO GR4 PILOT'S UNIT comments that this was a simple case of good lookout in

VFR, in free airspace using the "see and avoid" principle. The GR4 pilot attained an early spot, maintained visual contact throughout; ensuring that there was no risk of collision.

ATSI reports with RT transcript that the S76 crew was in communication with ANGLIA RADAR, but the Unit was not informed that an Airprox had been filed until nearly 4 weeks after the incident. The controller's recollections were understandably sketchy, but he recalled that both the traffic level and workload were light during the period of the Airprox. The S76 crew established communication with the ANGLIA controller at 1905, reported flying inbound to Humberside and requested a cruising altitude of 2500ft Humber RPS. The S76 crew was instructed to squawk IDENT, the ac identified in accordance with the procedures for providing a 'Modified RAS', and the crew's requested climb to 2500ft RPS (989mb) approved as the inbound cruising altitude. At that time, the ac was 43nm E of OTR routeing Helicopter Main Route 7 (HMR7) [1500ft-FL60], and at 1907:00, [over 6½min before the Airprox] the Claxby radar recording shows a pair of radar contacts, which is the subject Tornado pair 19nm N of Flamborough Head on a south-easterly track, some 60nm from the S76. If they had continued on their original track they would have passed well behind the helicopter. However, at 1910, the lead Tornado turned R onto a more southerly heading and into conflict with the S76, which was now in the Tornado leader's 10 o'clock - 32nm. The Tornados indicated 1900ft Mode C (1013mb) up to this point, which equates to an altitude of about 1250ft RPS (989mb). At 1912:15, the Anglia Radar controller queried the S76 crew's in-flight conditions, to which they replied "...we're Victor Mike Charlie". Traffic information was passed on the two unknown GR4 contacts at 1912:20, "...two fast moving contacts just showing on radar about 12 and 15 miles respectively from your 2 o'clock to cross right to left similar height". Twenty sec later the controller added, "...the nearest one to you now 8 miles right to left in your 2 o'clock 2700 feet [ALT 989mb] showing unverified". [Post UKAB Note (1): Mode C is displayed to the ANGLIA RADAR controller as an altitude below the transition altitude (T ALT) of 3000ft based on the applicable RPS for that sector. Above the T ALT Mode C is displayed as a Flight Level based on 1013mb.] Just before 1912:50, the S76 crew replied they had the other ac in sight, "yeah...got them are they going to go ahead of us or what?".

The controller advised "...your best avoiding action's is to continue at the moment I would say there's one gonna go probably just...slightly behind or ahead of you". Whereupon the crew confirmed that they were visual with both jets, which was acknowledged by the controller who added at 1913:00, "...they just climbed out of low-level they only appeared about er 5 miles by". Just before 1913:40, RADAR updated the traffic information advising that one of the contacts "should be one just about to go over the top now about 3000 feet". The crew responded "Yeah that's...straight over the top".

[UKAB Note (2): Analysis of the recording of the Claxby radar [as available to the ANGLIA RADAR controller at the time] at 1913:46, shows the lead GR4 indicating 4200ft Mode C (1013mb) just after it had passed 1100ft above the S76, which indicated 3100ft Mode C (1013mb) tracking N of HMR7 throughout the encounter. At the same time, the No2 GR4 indicated 3500ft Mode C as the jet passed R - L, 4nm ahead of and 400ft above the S76. Before the tracks crossed, in the previous sweep the leader indicated 4300ft Mode C some 1200ft above the helicopter.]

The ANGLIA RADAR controller continued to track the Tornados and subsequently informed the S76 crew of their destination. At 1923:10, the controller advised that there was no further known traffic to affect the S76 and suggested they switch to Humberside. The S76 crew advised that they would report the incident to their Company Operations and see if they could talk to the Tornado's Station, but no mention of an Airprox was made on RT.

The usual radar display configuration for ANGLIA RADAR consists of two displays, one above the other. The upper display showed the picture from the Claxby Radar and covered the northern part of the ANGLIA RADAR area of responsibility. Typically, this was set to a range of 60nm, displaying from abeam Flamborough Head to the south giving longer range coverage of 60-70nm and down to 2000ft. On the lower display, the Cromer Radar was selected and this gave good cover nearer to the coast.

The 'Modified RAS' is an ATS provided by certain NATs Ltd ATSUs and applicable only to those helicopter companies that have signed the Memorandum of Understanding - as here. Under

the 'Modified RAS', controller responsibility for providing separation between participating ac and unknown traffic, is identical to that under a 'standard' RAS. MATS Part 1, Section 1, Chapter 5, Page 3, 1.4.1 para (e), where "Controllers shall pass avoiding action instructions to resolve a conflict with non-participating traffic and, whenever possible, shall seek to achieve separation which is not less than 5nm or 3,000 feet...". The controller was unable to recall exactly when he saw the Tornados on his radar displays. It is probable that it was soon after they passed abeam Flamborough Head, but as the controller was concentrating on the southern part of his area where the S76 was operating, he believed that he would have been paying more attention to the lower radar display.

When the controller recognised the potential conflict he requested the S76 crew's in-flight conditions. Given the closing speeds of the ac (radar derived groundspeeds were 120 kt and 480 kt respectively) the time in which to issue effective avoiding action was limited. Traffic information was passed and the helicopter crew reported visual with the traffic. The controller advised that it was, in his opinion, common practice at this Unit for controllers to pass traffic information and, once the participating ac's crew reported visual, just to update the traffic information and not pass any avoiding action. Additionally, the expression "...continue at the moment" was a frequently used expression at the Unit and meant: 'I can give no effective avoiding action at the moment so continue on your present heading and be ready for any further instructions'. The point was reached where no avoiding action turns would be effective and the only choice remaining was a vertical resolution. The controller stated that he did not consider this option and, in his opinion, it was rarely used. The fact that the S76 crew did not advise, either on the RTF or by telephone, that it was their intention to file an Airprox report has, undoubtedly, made it more difficult to ascertain all the facts relating to this incident. The controller reported that the incident was 'a typical encounter in Class G airspace'.

[UKAB Note (3): The UK AIP, at ENR 1-15-1, promulgates that to enhance flight safety and expedite Search and Rescue in the Southern North Sea Airspace a Radar Advisory, Flight Information and Alerting service is available from.....ANGLIA RADAR [0630-2030 daily].

AIRPROX REPORT No 221/02.

These services are available to Helicopters.....and to civil & military ac transiting the area below FL65.]

[UKAB Note (4): The RAF FLIP UK Mil AIP, at ENR 1-15-1, reiterates the information at Note 2 for military pilots. HMRs are described as routes where helicopters are operating on a regular and frequent basis. HMRs have no lateral dimensions ...but the vertical operational limits are from 1500ft amsl up to and including FL60, with a caveat that helicopters may be encountered below 1500ft amsl in icing conditions.]

[UKAB Note (5): The UK RAF FLIP Mil AIP at Vol III Part 1-8-13 - HELICOPTER MAIN ROUTES - promulgates guidance to military pilots that - operations near HMRs should normally be conducted at or below 1000ft amsl or above FL85 and with due regard for civil helicopter operations when crossing HMRs.]

HQ STC comments that whilst the confliction was eventually resolved by the GR4 pilot climbing, he could have made a small early turn to give horizontal as well as vertical displacement. ANGLIA RADAR could have advised the S76 pilot to descend, having noted the Tornados were maintaining a higher altitude. Similarly, the S76 pilot could have acted on the information passed by ANGLIA RADAR, and with his early visual sighting descended to increase separation. Curiously, despite early identification of the confliction, neither the two pilots involved nor the controller, attempted any positive early avoiding action, despite all three having sufficient available information in good time. The degree of complacency exhibited by those involved - all expecting someone else to take positive action - is disappointing. Though not strictly pertinent to this Airprox, it would have been better if the GR4 pair had transited at the correct quadrantal level and whilst not mandatory (nor in many circumstances feasible) on this occasion the Tornados could have contacted ANGLIA RADAR for traffic information as they transited the HMRs.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

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

The Board noted the comments from HQ STC, recommending flight at the applicable quadrantal level even when flying under VFR and when not in receipt of an ATS. Analysis of the radar recording just before the Airprox indicated the GR4 pair was in fact flying at an applicable quadrantal level (FL35) - though apparently more by chance than by intention - nonetheless, the Board endorsed the Command's view on this topic. Here, the lead GR4 crew had chosen to transit at an altitude that took them through the HMR, but they were legitimately entitled to do so provided 'due regard' was given to commercial helicopter traffic on this route. In the Command's view, the crew had complied with the military regulations promulgated in the Mil AIP that did not prohibit fast jets from flying through the HMR. Though not 'legal', some Board members thought the Tornados' choice of routeing was poor and a call to ANGLIA RADAR could have produced a different outcome.

Here the GR4 crew was cognisant of the potential for conflict with helicopters and were looking out for them. It was evident to the Board that the lead GR4 crew (aided by NVG and FLIR in the absence of a CWS) had spotted the S76 in good time 8nm away and had elected to climb to increase the vertical separation, eventually achieving about 11-1200ft above the helicopter, but this was only a short time before the tracks crossed. A turn to pass astern of the S76 might also have been advantageous here but, nevertheless, the lead GR4 crew had taken positive action to afford vertical separation to the helicopter in Class G airspace. It was unfortunate that this was not made clear to the S76 pilot at the time and might have allayed his concerns over the encounter, but from the information provided by ANGLIA RADAR he was led to believe and thus reported, erroneously, that the vertical separation was 400ft when the jet overflew his helicopter. The altitude called by ANGLIA RADAR might have been derived from the lead GR4's level just before it climbed up and members were cognisant that SSR label overlap at close range can make it difficult for controllers to discern Mode C readouts. The controller had mentioned just before 1913:40, that the lead GR4 was "...just about to go over the top now about 3000 feet", which would certainly have given the S76 pilot the impression that the jet

was about 500ft above his altitude of 2500ft RPS. Members wondered which pressure setting the controller's call was related too; it was subsequently determined that the RPS is input into the ANGLIA radar equipment to display Mode C indications below the transition altitude of 3000ft as an altitude amsl. Given a RPS of 989mb, the difference between the two pressure datums was considerable (about 720ft) and it appeared as though the traffic information given, related to an altitude. The radar recording (where Mode C is based solely on 1013mb) showed that in the period leading up to the Airprox the GR4 Ldr indicated 3500ft (1013mb). The GR4's Mode C then increased to 3600ft equating to 2880ft RPS, and just before the traffic information was given at 1913:40, it indicated 3900ft (1013mb) - equating to an altitude of 3180ft RPS - but from that point the indication would have changed and would have been displayed to the controller as a FL tracking the GR4's climb ultimately to FL43, or 3580ft RPS. Whilst undoubtedly given with the best of intentions, the 'altitude' information given here did not 'paint' an accurate and complete picture of what actually happened; members thought this probably misled the S76 crew into believing that the jet was closer than it actually was. Consequently, members concluded this was probably why the Airprox was reported and formed part of the cause.

Although the GR4 had right of way under the 'Rules of the Air', the S76 crew was probably not well positioned to avoid the jet, unless doing so in the vertical plane - a descent might have been the preferred option here at close quarters. Nevertheless, the S76 crew had not been obliged to take avoiding action themselves, but civilian controller members were surprised at the way the ANGLIA RADAR controller had applied the RAS to the S76 crew. Despite the availability of radar data from the Claxby Radar, which had been displayed and showed the GR4 pair closing at long range, members noted that the presence of the jets had not apparently been detected by the controller's scan until a relatively late stage. The first indications of the conflict were reported to the S76 crew at 1912:20, more than 2min after the jets had turned onto a conflicting heading. Whilst seeking to achieve the prescribed separation

minima in the provision of a RAS to helicopters against conflicting fast jets, controller members opined that positive and robust avoiding action must be given at an early stage. Here the controller had passed traffic information and the S76 crew had sighted the jets some 30sec later (less than one min before the CPA), but he had not attempted to offer explicit avoiding action. The RT transcript suggested that this was a late spot by the controller, but the jets should have been plainly apparent to him. It was emphasised that there was little else to divert the controller's attention from this conflict - he had opined that the traffic level and workload were light during the period of the Airprox - which led members to conclude that the controller had left it too late to take avoiding action and in so doing had not fulfilled his responsibilities under the RAS and thus not provided the level of ATS the S76 crew could have reasonably expected. It was accepted that ANGLIA RADAR would not have known the intentions of the GR4 pair and controller members contended that in order to achieve any horizontal separation against the lead GR4 the options were limited, but a hard R turn onto N given early enough could ultimately have provided some horizontal separation and still given the S76 crew a better chance of acquiring the jets visually. As it was the controller offered little practical advice, that given was ambiguous and in effect he proffered only traffic information. Recognising that it was a 'modified' ATS agreed between the company and the ATSU, the controller should still have attempted to provide avoiding action and tried to achieve some degree of horizontal separation. A solitary view was that the controller had advised the S76 crew to maintain their heading, which he contended might be taken as avoiding action. However, the majority - civilian and military alike - agreed that the ANGLIA RADAR controller had not applied the RAS correctly and the traffic information passed about the lead Tornado, as it flew above the helicopter, gave the S76 pilot a mistaken impression of the vertical separation that pertained at that moment. In the end 'see and avoid' had worked - each ac had been seen from each other's cockpit - and the Board agreed unanimously that no risk of a collision had existed in the circumstances related here.

AIRPROX REPORT No 222/02.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The ANGLIA RADAR controller did not apply the RAS correctly and the traffic information passed about the lead Tornado, as it flew above the helicopter, gave the S-76 pilot a mistaken impression of the vertical separation.

Degree of Risk: C.

Post UKAB Note: Following the Board's findings on this Airprox, the Head of ATSI commented:

Whilst there is no doubt that the Anglia Radar controller could have done better, ATSI is concerned that the ATC contribution has been

deemed causal rather than contributory. As our report indicates, the most obvious avoiding action option may have been an early right turn onto North. However, turning a slow moving helicopter head-on to two high speed, converging contacts is obviously not an attractive proposition. To say that this action would have helped prevent the Airprox can only be speculative and, therefore, to attribute the cause primarily to the controller not applying the RAS correctly is somewhat harsh. All the more so when guidance/advice, designed and promulgated specifically to de-conflict military and air transport operations, had not been followed.

AIRPROX REPORT NO 222/02

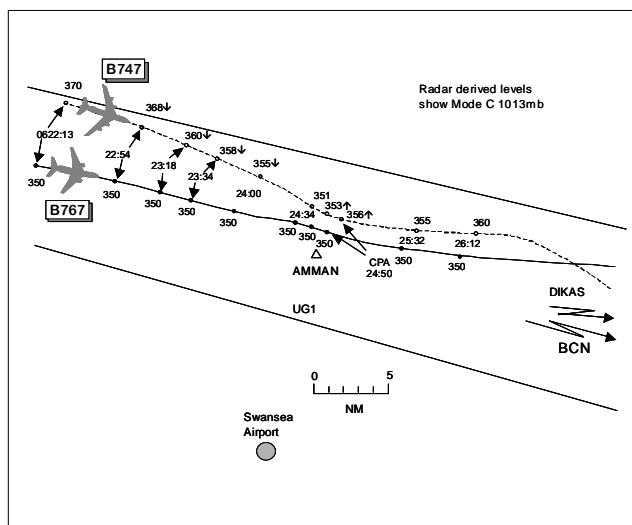
Date/Time: 15 Nov 0626 NIGHT
Position: 5153N 0355W (4nm NE AMMAN)
Airspace: UAR UG1 (Class: B)
Reporting Aircraft **Reported Aircraft**
Type: B747 B767
Operator: CAT CAT
Alt/FL: FL360↓ FL350

Weather VMC VMC

Visibility:

Reported Separation:
400ft V 500m H 400ft V 2nm H

Recorded Separation:
600ft V 1.5nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE B747 PILOT reports heading 115° at M0-80 inbound to Heathrow and receiving an ATS from London. Flying on parallel tracks with another ac and with both in descent, he thought, ATC turned both ac towards one another. TCAS gave an RA alert, which he complied with, and he saw the other ac visually to his R by about 500m and 400ft vertically below. He assessed the risk of collision as high. He opined that the RT delivery by the other ac's crew could have been better as it would

have allowed him time to query better the ATC instructions.

THE B767 PILOT reports cruising at FL350 on UAR UG1 routeing to DVR and receiving an ATS from London on 129.37MHz. Prior to DIKAS ATC told him to maintain his heading (108°) followed one min later by a L turn onto heading 100°. However, he noticed on TCAS an ac, the subject B747, in his 9-10 o'clock position descending.

After visually acquiring the B747, he informed ATC and asked them what he was required to do. After ATC told him to turn L onto 070°, which he refused owing to the B747's conflicting flight path, the controller then told the B747 to turn R onto 130° which was refused. ATC then told the B747 pilot to stop his descent at FL355 whilst continuing to pass conflicting heading changes to both ac before giving climb clearance to the B747 to FL360. London then stated that he had mislabelled or switched labels on his radar display by mistake and asked both crews to file a report. In hindsight, he realised that the controller had been trying to turn both ac away from each other but in reality had turned both ac towards each other. TCAS had 'turned red' but with no aural warnings and he had seen the B747 400ft above and 2nm to his L. He did not assess the risk.

ATSI reports that the controller was operating Sectors 5, 8 and 23 in bandboxed mode. Approximately twenty minutes before the incident Sectors 6 and 9 had been split from the position. He commented that it was standard practice, owing to staffing considerations, to operate in this manner at that time of the morning. He described the workload as moderate in the one hour ten minutes he had been in position.

The Tactical Controller stated that prior to either of the subject ac contacting his frequency, he had repositioned their Track Data Blocks (TDB) on his radar display. He explained that the two ac had been tracking together, the B747, at FL390, was just behind and N of the B767 at FL350. He confirmed that their respective TDBs could be clearly seen, as they were not garbling/overlapping at the time. His initial plan was to route the B767 direct to VABIK (a reporting point 25nm E of DVR), en route to Brussels, and the B747 direct to Ockham (OCK) for Heathrow. This would result in the B767 tracking N of the B747. Accordingly, he positioned the TDBs of the two ac in that configuration i.e. the B767's TDB NE of its radar return, marked by a diamond, and the B747 to the SW of its associated diamond. This meant that, providing the ac were routed in accordance with the controller's initial plan, the TDBs would, later, reflect their geographical positions relative to each other.

The B767 established communication with the Sector, at 0614:30, reporting maintaining FL350. However, instead of being routed to VABIK, as

originally intended, the flight was instructed to route via Strumble (STU) and UAR UG1. The controller explained that he changed his plan because routing the ac direct to VABIK would have involved co-ordination with the Daventry Sector, at a time when that sector would have been getting busier. Shortly afterwards, the B747 made its initial call to the sector at FL390 and was cleared direct to Ockham (OCK), with a request for it to reduce speed, due probable delays in the OCK hold. This change to the controller's original plan resulted in the B767 routing along the centreline of UG1 and, consequently, to the S of the B747. The TDBs of the subject ac were still positioned as if to give the impression that the B767 was N of the B747.

At 0619:21, the B747 was given descent to FL370. The radar shows the B747, 5.5nm N of the B767, which is tracking towards STU. However, the controller admitted that, by his actions, the relative positions of the two ac on his radar display were transposed. Consequently, when he instructed the B767 to continue on its heading of 108° and the B747 to turn R heading 115°, he believed that their tracks would diverge, so as to ensure that, if descent clearance was issued, horizontal separation would exist before vertical was lost. Accordingly, the B747 was given descent to FL310, at 0622:30 when the two ac were 4.7nm apart. From observation of the radar replay of the event, it is readily understandable why the controller made the error that he did, in respect of the relative positions of the subject ac.

The controller said that he was surprised to see that the tracks of the two ac, rather than diverging as he anticipated, were slowly converging. He even mentioned this to the Planner but added that he did not invoke any input from his colleague because he told him he was going to resolve the problem by giving both flights further turns, as he believed, away from each other. Accordingly, the B747 was instructed, at 0623:30, to turn R heading 125° and the B767 to turn L heading 100°. Noticing that the tracks were still closing, the controller, believing that the B767 may have made an error, asked the pilot to report his heading, which was confirmed, correctly, as 100°. By 0624:00, the distance between the subject ac had decreased to 3.1nm, by which time the B747 was at FL355. The controller said that, although he could still not work out why the two ac were converging, he realised there was a continuing

AIRPROX REPORT No 222/02.

reduction of separation, which needed to be addressed. He added that the only alternative he had was to provide vertical separation. Observing that the B747 was passing, he recollected, FL356 he, initially, sought to provide 500ft 'emergency' separation by instructing it to stop its descent at FL355, while he sorted out in his own mind what was happening. He also informed the pilot that there was traffic on his LHS at FL350. Unfortunately, the pilot made no comment about the traffic actually being on his RHS. Still trying to resolve the situation laterally, the controller gave the B767 an avoiding action L turn heading 070°, although the B747 also replied to the call before it, in turn, was given an avoiding action right turn heading 180°. During this period there were several simultaneous transmissions, after which the B767 was heard to report traffic at ten o'clock, about two miles, and ask "what do you want us to do?". The controller said that he did not recognise the significance of the pilot's message, with reference to the position of the traffic relative to the B767. He again passed an avoiding action turn to the B767, this time onto a heading of 050°. The pilot replied: "Negative I'd turn into him". Not registering this information, the controller sought confirmation from the B747's pilot that he was maintaining FL355. The pilot responded that he was at FL357, with traffic in sight on his R. Still persisting with his plan to try and diverge the tracks of the subject ac according to the way their TDBs were displayed, rather than basing it on the relative position information having now been passed by both crews, the controller issued a R turn heading 130° to the B747 (the pilot had not taken the turn onto 180°) and a L turn heading 100° to the B767 (the pilot appears not to have deviated from his original track throughout the encounter).

The B747 was cleared to climb to FL360 at 0625:32 and reached the cleared level at 0626:13, after which the tracks of the two ac are seen to cross as the B747 makes its R turn. The controller stated that, it was only at about 0626:30, he realised that he had transposed the relative positions of the subject ac because of the way the TDBs had been positioned and made comment to that effect on the frequency to both pilots. Radar reveals at 0624:34 that the B747 had continued descending to FL351 before arresting its descent and climbing. At its lowest level it was 100ft above the B767, which was 1.8nm to its SW, both ac being on conflicting tracks. It is understood that a

passenger was thrown off balance and sustained an injury when the B747 commenced climbing.

[UKAB Note: The CPA occurs 16sec later, at 0624:50, the B747 is indicating FL356, 1.5nm NE of the B767, 600ft below.]

With regard to the controller's plan to provide an initial 'emergency' 500ft vertical separation, The Manual of Air Traffic Services Part 1, Section 1, Chapter 3, Page 2, states, with reference to a loss of separation, that: "*If, for any reason, a controller is faced with a situation in which two or more ac are separated by less than the prescribed minima (for example, air traffic control errors or differences in the pilot's estimated and actual times over reporting points) he is to: a) Use every means at his disposal to obtain the required minimum with the least possible delay; and b) When considered practicable, pass traffic information if a radar service is being provided, otherwise, pass essential traffic information*". However, it is realised that, on this occasion, as the controller was obviously confused about why he was unable to resolve the conflict laterally, he did, at least, attempt to provide separation sufficient to overcome any risk of collision.

Much discussion took place concerning the issue of whether there should be a line (strut) connecting the diamond, the radar symbol indicating the ac's position, and its associated TDB. The controller explained however that, if the position of an individual TDB needs to be moved, the initial operation is to use the 'mouse' to click on the target and then drag the TDB in the desired direction. Whilst carrying out this action, a strut appears on the radar display. There are sixteen position options available, eight close to the ac symbol and eight further away (approximately 2cm). If the TDB is placed in the position close to the diamond, the strut disappears. The strut is only displayed when placed in the outer positions. Had the struts been displayed on this occasion, there would not have been any confusion about the relative positions of the ac. Transposing TDBs is a routine matter and as long as connecting struts remain attached there is little scope for error. This situation reverses however if the struts are not displayed.

As a result of this incident, a LACC Safety Notice was issued concerning the positioning of individual TDBs and the lessons to be learnt from

this incident. It mentioned two clues which would assist controllers in discovering that they had transposed the acs' idents i.e. *"If a TDB appears to have moved relative to the diamond believed to be associated with it – this is not possible."* And *"If the TDB begins to encroach onto the diamond – this is also not possible."* Both the relative movement and the encroachment occurred on this occasion. Additionally, the LACC ATS Investigations Section made two recommendations as a result of this incident, both of which have been accepted by the Deputy General Manager, Technical: *"1) It is recommended that unit management instruct all ATC staff when an individual Track Data Block is re-positioned, it must be placed in one of the positions that enable a strut to be displayed; 2) It is recommended that unit management consider disabling the functionality that allows an individual Track Data Block to be re-positioned without a strut being displayed on completion of the task"*.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The ATSI advisor informed members that the S5, 8 & 23 Tactical controller had raised two further comments post incident. First, the latter said that requests had been made previously from the NERC Training Team (NTT) at Swanwick to change the equipment functionality so as to prevent the controller being able to move a TDB without a strut. However, according to the LACC Safety Manager, no mention of 'strut' or 'leaderline' had been made in any NTT or Operational Conversion training observations. Second, the controller said that the Planner and other controllers had gathered around the screen during the loss of separation where they could see the alleged error clearly but had not mentioned it to him until after separation had been restored. Members noted these points and went on to discuss why the incident had happened. Having transposed the B767 and B747 TDBs to meet the requirements of his original plan, the S5, 8 & 23T then changed his mind about the subject ac's routing and devised a new plan. Crucially,

however, he seemed to have forgotten that he had 'swapped' the TDBs. Consequently, the Tactical controller had placed both the B767 and B747 on tactical headings which, according to his 'mindset', would allow both tracks slowly to diverge, thereby safely increasing lateral separation, whilst he descended the B747 through the level occupied by the B767. However, in reality, the opposite occurred, with both ac slowly converging in the horizontal plane as the B747 descended into conflict with the B767 and this had caused the Airprox.

Members were concerned. Although the controller had been unable to change his 'mindset', irrespective of the visual and audio clues that something was wrong, presented to him during the encounter, it might be possible for the same situation to occur again. TDB overlap is a common occurrence at LACC owing to the label size used and the number of ac within the large volume of airspace covered by each Sector so controllers routinely move TDBs on their displays. It was agreed that the CAA should ask NATS to review and amend the way that TDBs and ac symbols are displayed to remove the scope for any similar future confusion.

Turning to risk, it was apparent that the Tactical controller had missed several indications on the actual situation that pertained at the time. One, the subject ac were converging on headings that should have caused their tracks to diverge. Two, the relative positions of the TDBs and their associated ac position symbols were changing. Three, the B767 crew had monitored the situation on TCAS and, having been issued with an avoiding action L turn, had visually acquired and then reported the traffic in sight in their 10 o'clock, and that the L turn would turn him into it. However, the controller was still convinced that the B767 was N of the B747. Seeing that the subject ac were still converging, he had attempted to establish emergency vertical separation, by stopping the B747's descent whilst it was still 500ft above the B767, whilst he tried to reason what was happening. However, it appeared that at about the same time, TCAS gave a TA warning then RA *"climb"* alert to the B747 crew, who followed its guidance. During this flight path profile change, the B747 crew had arrested their descent at FL351 before climbing and had visually acquired the B767 to their R, 400ft below; the crew reported this sighting to ATC. In the end, the

AIRPROX REPORT No 223/02.

Tactical controller realised that he had transposed the TDBs only after he had climbed the B747 to FL360 and after tracks had crossed. Although the controller had been confused, both crews knew what the situation was and their actions persuaded the Board that any risk of collision had been effectively removed.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The LACC S5, 8 and 23 Tactical controller confused the relative positions of the B747 and

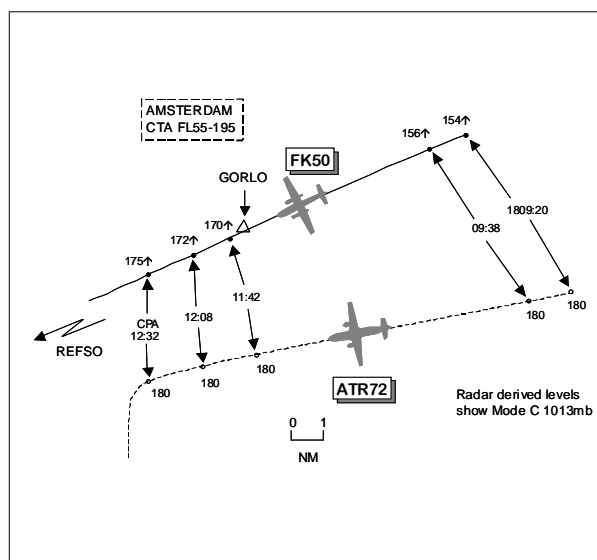
B767 and descended the B747 into confliction with the B767.

Degree of Risk: C

Recommendation: The CAA asks NATS to review and amend the way in which Track Data Blocks and aircraft symbols are displayed, to remove the scope for any similar future confusion.

AIRPROX REPORT NO 223/02

Date/Time: 14 Nov 1812 NIGHT
Position: 5153N 0305E (16nm ENE REFSO)
Airspace: CTA (Class: A)
Reporter: LACC S14T
First Aircraft Second Aircraft
Type: FK50 ATR72
Operator: CAT CAT
Alt/FL: ↑FL180 FL180
Weather VMC VMC
Visibility:
Reported Separation:
not seen 5nm H
Recorded Separation:
500ft V 3.3nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE LACC SECTOR 14 TACTICAL CONTROLLER (S14T) reports that during a very busy period, owing to a lot of weather problems, he noticed the fpss of an ATR72 and FK50 were indicating that both ac were at the same level. On looking, he saw the ATR72 maintaining FL180 and he asked the S14P (Planner) if a revision had been passed on the FK50 who also showed FL180 on the fps. He then noticed the FK50 was climbing so he gave avoiding action to the ATR72 pilot to 'turn hard south'. The only action he could remember doing was to 'lock' the FK50 on its heading on initial RT contact.

THE FK50 PILOT reports that he was transferred from Amsterdam frequency to London and after a while, ATC queried his flight level. When he, the Capt, replied FL180, ATC questioned who had given the clearance; he replied "you did". ATC then asked what level Amsterdam had cleared them to which the Capt answered "FL160". He checked with his FO whether he recalled the clearance to FL180, which he confirmed. No other traffic was seen on TCAS or visually.

THE ATR72 PILOT reports flying inbound to Gatwick heading approx 270° at 220kt in the

REFSO area. The flight had been under the control of Amsterdam before being transferred to London. The crew had been monitoring a target on TCAS which appeared to be below their ac in the 1-2 o'clock position a few miles away but it was not perceived as a threat. A few minutes after initial RT contact, London ATC told him to *"turn left radar heading 190 avoiding action"* owing to traffic flying in London airspace but under Amsterdam control, the crew of the other ac were then heard to contact London, he thought. The controller was heard at first to question the other ac's cleared level and heading and then secondly, who had issued the climb clearance. TCAS displayed the target as a solid cyan diamond at the closest point but there was no audio alert throughout the 'avoiding action' manoeuvre. In fact, the ac was so far away that, to aid spatial awareness, he asked ATC to confirm that the ac concerned was the target showing about 5nm behind his ac, which they did. ATC did not indicate that a report would be filed so, as the separation was judged to be adequate and safety had not been compromised, an ASR was not filed, the flight documentation was not annotated with relevant detail and so was disposed of, as usual, after the flight was completed. Subsequently, it had been a surprise to hear that a report had been filed, his report being completed from memory.

ATSI reports that at the time of the Airprox, both ac were under the control of the Sector 14 Tactical (Radar) controller (S14T). He described his workload as 'medium to high' and likewise the traffic level. He had one and a half bays full of fpps and ac requesting weather avoidance added to the workload. The ATSA's telephone panel failed prior to the Airprox and that is discussed in the ATS analysis. Although the Airprox itself was relatively simple, the events preceding it, as will be seen, are very complex. It proved very difficult to collect and interpret all the relevant information, however, the following analysis has been prepared using the information which was available.

The FK50 established communications with the S14T controller at 1809:20, reporting climbing to FL160 on track to REFSO. The Tactical controller replied *"FK50 c/s roger on reaching flight level one eight zero continue on your heading"*. The crew replied *"Climb maintain flight level one eight zero and at level one eight zero maintain the heading*

FK50 c/s". The Tactical controller's Paper Flight Strip (PFS) indicated the allocated level for this flight was FL180, he did not notice the pilot's original report that he was climbing to FL160.

The FK50 was tracking along the centreline of the airway and, at the time of reporting on frequency, was passing FL153. Meanwhile, the ATR72 was 6nm SSE of the FK50 maintaining FL180, on a converging track. The ATR72 established communications with the Tactical controller at 1809:40, less than 20 sec after the FK50 had called. The Tactical controller acknowledged the call from the ATR72 and advised the crew to expect a TIMBA 2E arrival at Gatwick. The pilot of the ATR72 did not report his level, as is required when establishing contact with another ACC, had he done so, it may have drawn the controller's attention to the developing situation.

At 1811:39, STCA activated and the Tactical controller was, initially, unsure as to the cause of its activation. Just under half a minute later, at 1812:05, he transmitted *"ATR72 c/s avoiding action turn left heading one niner zero there is traffic in your three o'clock range four miles climbing beneath you"*. The crew acknowledged the transmission and complied. The FK50 was 3.5nm to the N and 800ft below the ATR72. At the CPA (1812:32), separation reduced to a minimum of 3.3nm and 500ft, as the turn undertaken by the ATR72 took effect. Standard separation was quickly restored. When the Airprox took place the Tactical controller initially informed the crew of the ATR72 that the other ac was not on his frequency but still working Amsterdam. When he subsequently called the FK50 he was slightly surprised to realise it was actually on his frequency. This incident took place after a busy 90-min session on the radar during which the traffic situation remained complex throughout.

Prior to the actual Airprox, a number of events took place. At approximately 1750, the ATSA's telephone panel failed. He could hear the telephone ringing but his display was blank and so the Sector 14 Planner (S14P) took the call at his position; it concerned flight details on a B737 about to enter the sector. The unserviceability was reported and whilst the arrival of the engineer was awaited, the panel began to illuminate slowly of its own accord. This permitted the ATSA once more to identify agencies that were calling.

AIRPROX REPORT No 223/02.

A short time later at approximately 1755, Amsterdam ACC called and passed the ATSA details of a level revision on the FK50, which would now be climbing to FL160 rather than FL180 as originally planned. The ATSA had looked for the electronic flight details but could not see them and so wrote the revision on a piece of paper located between the Planner and himself. He then set about trying to find the FK50's flight details via the 'Find Flight Window', but was interrupted by the Planner who asked him to input the flight details on the B737, mentioned previously, into the Host Computer System (HCS). The ATSA agreed, but in turn said that he asked the Planner to enter the level revision on the FK50. However, he could not remember whether the Planner had acknowledged this request or not, and the Planner stated that he had no recollection of being asked to input the revision. Later the piece of paper on which the FK50's flight details were written was examined. It showed the level revision; the flight plan details were written in green ink (as used by the Planner) and the level revision on the FK50, in blue ink (as used by the ATSA).

Towards 1800, the ATSA handed over his position to a colleague. Problems with the telephone panel were covered but not the FK50's level revision. He was convinced that the Planner would have entered the revision and, as a result, a message would be printed notifying the change, which would be handed to the Planner.

A replay of the ATSA's and Planner's Workstations, as well as obtaining a listing from the electronic log of the HCS, showed what inputs/outputs had been carried out and where. The Planner answered the telephone call from Amsterdam at 1751, regarding the B737, and attempted to find its flight details by using the 'Find Flight' facility, searching on the company designator. Having found the flight in question, nothing appears to have been done with the details. At 1753, the ATSA used the same search facility, found the B737 flight and took the necessary action. At 1753:27, the ACT message was received on the FK50 at FL180. At 1754:11, the B737's level and squawk were entered at the ATSA's position and some 20 sec later, an electronic strip appeared in the Auto Accept bay of both ATSA and Planner, with a red diagonal line through it. The red diagonal line indicated that the computer had rejected the flight and an error

message would have been sent to the originator. All this added to the distractions which were taking place at the time.

At 1755:30, the ATSA took the call from Amsterdam (the level revision on the FK50 climbing to FL160). Further amendments to the B737's flight details were input and the 'crossed out' electronic strip on the flight disappeared from both the ATSA's and the Planner's display, replaced by a new electronic strip that indicated the computer now accepted the details and the B737's entry into the sector. At 1756:56, the assigned level of the FK50 from FL180 to FL160 was amended at the ATSA's position and, 4 sec later, a paper flight progress strip on the flight was printed. Examination of this strip indicated that the cruising level was shown as FL180 and the requested level FL160. This is how the system operates; even though correct data was entered, changing the cruising level, the paper strip did not reflect the change.

Following these actions, the exit level was changed to FL180 at 1757:20, at the Planner's position. Moments later at 1757:26, the assigned level of the FK50 was amended to FL180, i.e. effectively undoing the amendment input made earlier at the ATSA's position. It was also established that the ATSA was relieved at approximately 1800.

The unit's MATS Part 2, GEN 3.7 para 3.7.3 (Responsibilities of the Planner) includes: *'Ensure that crossing clearances, joining clearances, releases and any changes to coordination are reflected in the PFS as necessary, and that any such changes to coordination are notified to the Tactical'*. Additionally, the two electronic strips (that for the FK50 and the ATR72) were in the Planner's 'Accepted Bay', next to each other, waiting to be co-ordinated out manually, with both showing the same time and level.

The PFS as presented indicated that the ATR72 was accepted into the sector at FL180 with a REFSO time of 1816 and an estimate for ERING of 1826, whilst that for the FK50 also shows the level as FL180, REFSO at 1817 and LOGAN at 1826. The Planner stated that it was common practice for Amsterdam ACC to pass estimates (automatically accepted by the OLDI link) on two or more ac at the same level with similar or identical estimates for the same position and was

not unduly concerned by this situation. He would have expected a subsequent telephone call from Amsterdam stating how the flights would be separated, e.g. placed on radar headings. If he was not satisfied with the separation offered, he would draw the Tactical controller's attention to it. On this occasion, Amsterdam did not call to say how the flights would be separated and he was, apparently, unaware of the level revision and so, should have alerted the Tactical controller to the situation. The MATS Part 2 makes no mention of this practice other than, on page CIn 2.6 para 2.6.2.2, which states that Amsterdam is permitted to use 3 minutes reduced longitudinal separation provided the distance between the ac does not fall below 20nm. Furthermore, on page CIn 2.6 para 2.6.2.7 there is the provision for silent radar handovers between Amsterdam ACC and S14 provided a radar spacing of 10nm exists. However, there is a note to the effect that this 'separation' must not be used for planning and data transfer purposes where standard vertical or longitudinal separation must be applied. One of the Planner's responsibilities is to ensure that separation exists, at the time of acceptance, between the entry flight level of ac coming into the sector and the entry flight levels of previously accepted ac.

When the FK50 reported on frequency, there was only 6nm horizontal separation between it and the ATR72, with both ac on their own navigation, i.e. none of the aforementioned conditions for transfer were met. From the Amsterdam viewpoint, this was safe as the ATR72 was maintaining FL180 and the FK50 was only climbing to FL160, however the Planner did not know this, for the reasons explained. He would see both estimates having been automatically accepted at FL180 and displayed to him on his electronic strips. The Tactical controller freely admitted that he was concentrating on a problem at LOGAN and it is unfortunate that he did not detect, from the FK50's initial transmission, that the ac was only climbing to FL160 and not FL180 as shown on his PFS. Furthermore, his phraseology to the FK50 was not in accordance with 'best practice', which states that a controller should not mention an ac's 'cleared level' when responding to a crew's initial RT transmission on the frequency. MATS Part 2 Gen 2.7, para 2.7.5 Confirmation of Cleared Level states: *'It is the pilot's responsibility to report their cleared level on first contact after a frequency change. If the cleared level is omitted from the*

pilot's initial call. It shall be confirmed in the ATC reply and an acknowledgement received'.

The Tactical controller also explained that it was his normal practice to tick the callsign on the PFS when ac established contact with him, however, he could not explain why he had done this with the ATR72 but not with the FK50, other than that he had to look for the strip in the strip display. However, he had written an 'H' on the strip to indicate it was on a radar heading.

The design of the LACC system separates the levels printed in the live level box from the level in the flight plan data as held by the HCS. This permitted a PFS to be printed, following an amendment, with an incorrect 'active' flight level on it. It was the Planner's responsibility to ensure correlation between the electronic and paper flight progress strips as presented to the Tactical controller and to point out any anomalies. It appears, however, that an incorrect level can be printed on a PFS, even when appropriate amendments have been correctly input.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members commended the detailed report from ATSI. When the FK50 first called on frequency, the busy S14T did not assimilate the information contained in the transmission (climbing to FL160) and, by using the words that he did in his reply, implied that the FK50 was cleared to climb to FL180. Moreover, when the ATR called shortly thereafter, he did not recognise the confliction between the ac, either from the radar or the PFS. In essence, the S14T had allowed the FK50 climb into conflict with the ATR72 and this had caused the Airprox. However, all of the information/data that was available to the Sector team had not been disseminated prior to the incident which contributed to the Airprox. Firstly, the Planner did not recognise the apparent lack of separation between the subject ac, as presented to him by the 'electronic strips' in his bay, and accepted both ac into the Sector in potential conflict without

AIRPROX REPORT No 223/02.

arranging separation subsequently. Secondly, neither the ATSA nor the Planner informed the Tactical controller about the clearance change from FL180 to FL160 for the FK50; the assigned level was never manually updated on the PFS. Although the Planner was responsible for co-ordination into and out of the Sector, the ATSA had taken the level revision call from Amsterdam. The level was updated at the Planner's position on the electronic strip back to FL180 after the input had been changed to FL160 at the ATSA's position to reflect the Amsterdam call. The Board was unable to resolve who made the inputs but this breakdown in teamwork had led the S14T to be presented with incorrect PFS data i.e. both ac PFSs showing FL180.

Although the S14T had not 'taken in' the crucial information contained within the initial call from the FK50, he had noticed the PFS assigned level error. Both ac were on slowly converging tracks and STCA had activated as the FK50 was climbing through FL170 and shortly thereafter, the controller gave an avoiding action L turn to the ATR72. Neither crew received any TCAS warnings although the ATR72 crew had watched the FK50 on TCAS and visually acquired it out to

their R. Subsequently the ATR crew were surprised at the subsequent reporting action of the S14T as they perceived that the other ac had been about 5nm away after they had turned. The prompt actions of the ATR crew had rendered the incident benign which 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 S14 Tactical controller allowed the FK50 to climb into conflict with the ATR72.

Degree of Risk: C

Contributory Factors:

1. The Planner accepted both ac into the Sector in potential conflict without arranging separation subsequently.
2. Neither the Planner nor the ATSA informed the Tactical controller about the clearance change from FL180 to FL160 for the FK50.

AIRPROX REPORT No 225/02.

the extended centreline he was warned of 6 gliders in the vicinity. Just before GP interception, whilst hdg 262° at 200kt, 2 gliders were seen, the 1st passed 200m ahead and 300ft below, the 2nd passed 1000m to his R and 200ft below. No avoiding action was required, although the severity of risk was assessed as medium. No markings on the gliders were distinguishable due to a combination of poor visibility, resulting from rain, and late acquisition. He added that gliders should avoid the Eglinton ILS GP and should not cross the area below 3500ft.

THE EGLINTON DUTY ATCO reports that he was providing a procedural approach service [UKAB Note: Eglinton is not equipped with radar] to the SF34 inbound on RW26 ILS. Earlier in the day he had been advised by the Bellarena glider tug, that the site would be active with up to 8 gliders and this information was passed to the SF34 pilot. At about 7nm final the pilot reported that a glider had passed about 400ft below followed, shortly afterwards, by another about 300ft below. After landing the SF34 captain reported that he would file an Airprox.

UKAB Note (1): No mention is made in UK AIP AD 2-EGAE Warnings of gliding activity at Bellarena. However, City of Derry Airport (Eglinton) MATS Pt 2 Chap 10 states: *“The Ulster Gliding Club operates gliders from the Bellarena site situated 9 miles NE of Derry Airport. The gliders are capable of transiting many miles from the site but the largest concentrations are usually adjacent to the gliding site and on the Binevenagh Ridge to the South of the site. The ILS centreline for Runway 26 passes within 3.5 miles of this site at its closest point. It is important therefore that aircrews on the ILS or in the vicinity of the gliding site are provided with accurate information on the activity status of the gliding site. The following outlines the procedure to be followed.*

Operating status of the Ulster Gliding Club

Monday to Friday

The Duty ATCO can assume the Ulster Gliding Club is not active unless otherwise notified by:

A telephone or radio call from the Gliding Club stating they are open, or

Correspondence has been received indicating the Gliding Club will be active on that day.

Ulster Gliding Club – Start of Operations

When opening for the day the Ulster Gliding Club Duty Flying Instructor will telephone City of Derry Airport ATC (telephone 71811099) and report the gliding Club as active. If ATC, City of Derry Airport have not opened the call will be diverted to Airport Security, who will pass the message to ATC on their arrival.

On the first flight of the day the tug pilot will call Eglinton Approach on frequency 123.625MHz and report that the gliders are now airborne. He will pass the following details:

Maximum anticipated altitude

Maximum anticipated number of gliders

Anticipated operating areas of gliders

If any of these details change significantly during the course of gliding operations, the tug pilot will pass revised details to ATC.

Glider Pilot Actions

In the interests of flight safety, prior to operating within 2nm of the ILS centreline, gliders are advised to contact Eglinton Approach on frequency 123.625MHz for traffic information.

ATC Procedures when the Bellarena Gliding Club is active

When the Gliding Club is known to be active the duty ATCO will take the following actions;

Advise the Ulster Gliding Club Duty Flying Instructor that the Airport is active (state closing time) and that the ILS will be active at all times within this period.

Place the Bellarena Gliding flight progress strip on the flight progress board.

Annotate the flight progress strip with known details of the Bellarena activity such as;

Maximum anticipated altitude

Maximum anticipated number of gliders

Anticipated operating areas of gliders.

Advise aircrews adjacent to Bellarena or carrying out an instrument approach of the gliding activities. Pass the contact frequency (130.1MHz) to any aircrews requiring further information on the gliding activities.

If the airport hours are extended beyond the time stated in 1. above, contact the Ulster Gliding Club Duty Flying Instructor and advise him of the extension.

Note. As the Airspace is Class G, this procedure does not guarantee that all traffic operating in the Bellarena area and the area associated with the ILS will make contact with ATC."

THE SCHLEICHER ASKa13 GLIDER PILOT reports that his glider had a red fuselage with white wings. He was conducting an instructional flight and listening out on Bellarena Radio 130.1MHz when, at approximately 1245, he heard an incomplete transmission from a pilot calling to report joining the ILS for Eglinton. Bellarena Radio replied that there were 6 or 7 gliders in the vicinity who would be listening out. The calling pilot acknowledged the response and indicated that a good lookout would be maintained. Law agreed procedures he left the ILS area and was transiting, at 40kt, E to W in front of the SW face of Binevenagh in VMC, clear of the ILS, and descending through 2000ft (Bellarena QFE) when, at approximately 1300, a Saab low-wing twin ac appeared about 500ft away from behind and above the starboard wing. The ac passed directly over the cockpit crossing from his 4 to 10 o'clock and, although unfamiliar with the size of the ac, he thought it about 200ft or more above. No avoiding action was necessary, nor did he see any taken by the Saab pilot. However, had the other ac been a glider he would not have considered the event unusual at that location. But because it was a commercial ac, the relative speed difference and because the Saab was descending he reported the incident to the club on landing. He assessed that risk had been medium, assuming that the Saab pilot had him in sight.

THE SCHLEICHER ASW19 GLIDER PILOT reports that he was flying his glider, which was coloured white, near Keady Mountain [4nm SE Binevenagh spot height] but saw a band of showers move between his position and the Bellarena gliding site. He headed back towards the gliding site but was caught between the bad weather to the N and the ILS region to the S. He flew in this region encountering some rain but avoided getting too near to the clouds. At 1256 he noticed the inbound [to Londonderry/Eglinton] ac about 2 miles away to the E and kept it in view until it passed with minimum distance around 1km.

THE GLIDING CLUB CHAIRMAN reports that the procedure with City of Derry Airport [as published in MATS Pt 2] was agreed and implemented in Jul 99. However, from the perspective of the Club the procedures are overly complicated in as much as it would be preferable that individual glider pilots should not be required to call on Eglinton Approach when they are close to the ILS, but rather Eglinton ATC broadcast on the gliding frequency, 130.1MHz, when traffic is on or about to use the ILS. Few gliders, it should be noted, are equipped with a radio having Eglinton Approach frequency; most are capable of transmitting and receiving on 130.1. Nevertheless, the procedure is included in the daily briefing that precedes flying and has been given increased emphasis since the reported incident. Furthermore, as regards the Club's radio procedure, all ac usually operate on 130.1MHz with only the tug ac being on Eglinton Approach. The tug pilot, or an instructor in an airborne glider, or the log-keeper on the Club base radio acknowledges any incoming call from commercial traffic.

UKAB Note (2): Bellarena gliding site (5506N 00658W) is not listed in the UK AIP ENR 5.5 under Glider Launching Sites. However, the AIP promulgates Benone Strand (551000N 00651W) as a site "*by winch/ground Tow, V limits 2000ft agl, active daylight hours with site elevation SL*" and listing the operator as the same gliding club.

UKAB Note (3): Met Office archive data reveals that the Londonderry/Eglinton 1250 METAR was:

22013KT 8000 SHRA SCT021 09/06 Q1022=.

UKAB Note (4): Analysis of the Tiree radar data recording reveals that the reported incident

AIRPROX REPORT No 225/02.

cannot be seen on radar. However, radar shows the SF34 on a NW track and in descent; it then turns L on to the RW26 ILS and levels at 023 on Mode C (equating to 2570ft on Eglinton QNH 1022mb) at 1256:25. At this point there are 2 slow-moving, primary contacts at 10 o'clock to the SF34 tracking WNW at a range of about 0.5nm. The SF34 passes to the N of these contacts and maintains altitude until 1257:45 when descent, presumably on the ILS GP, is recommenced. The reported incident would have occurred shortly beforehand. By this time one of the slow-moving contacts has disappeared from cover, whilst the other crosses behind the SF34. Two radar sweeps show the SF34'S Mode C indicating 022Ø. The next, however, shows 024!, although this is probably the result of Mode C garble with the radar return of a high level overflight rather than indicative of a vertical manoeuvre by the SF34. The next sweep displays no Mode C but on the sweep timed at 1258:19, the SF34 displays 019Ø on Mode C. Thereafter the SF34 disappears below radar cover.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It seemed to members that despite the arrangements that were in place to co-ordinate flying activities at City of Derry Airport and the Ulster Flying Club, these were not sufficient to prevent conflicts between gliders and aircraft on an ILS approach to the airport. Glider pilots appeared to be at liberty to operate at any time within 2nm of the ILS centreline and were only advised to be in contact with Eglinton Approach to receive traffic information - however, not all gliders carried the appropriate radio frequency. Moreover, if airline pilots wanted more than

general information on gliding activity in the approach area, the onus was on them to contact the Ulster Flying Club.

In this Airprox the ASKa13 glider pilot heard the call on the Club frequency from the approaching SF34 pilot and had started to fly away from the ILS. However, at 40kt there was no time to clear the area before being overtaken from above as the airliner intercepted the glidepath. Having overflowed the ASKa13, the SF34 next flew past the ASW19 which was well out to starboard and slightly below. In neither case was avoiding action necessary, but note was taken of the inflight weather conditions reported by the airline pilot - 5km in rain - who, like the glider pilots, had an equal duty to "see and avoid" in Class G airspace. This had worked on this occasion, but similar future conflicts on the RW26 ILS approach seemed likely unless arrangements were changed to remove their cause. 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 then addressed the risk of collision in this incident. All were agreed on the potential and future potential for a more serious outcome, but in terms of what had taken place there had been no collision risk in this instance.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict on the Londonderry RW26 ILS approach in Class G airspace.

Degree of Risk: C

Recommendation: The City of Derry Airport and the Ulster Gliding Club reviews jointly their operating procedures.

AIRPROX REPORT NO 226/02

Date/Time: 17 Nov 0436 (Sunday) NIGHT

Position: 4646N 02638W

Airspace: Shanwick OCA (Class: A)

Reporter: Shanwick OACC ER3 Controller

First Aircraft Second Aircraft

Type: B767(A) B767(B)

Operator: CAT CAT

Alt/FL: FL350 FL350

Weather: VMC NK

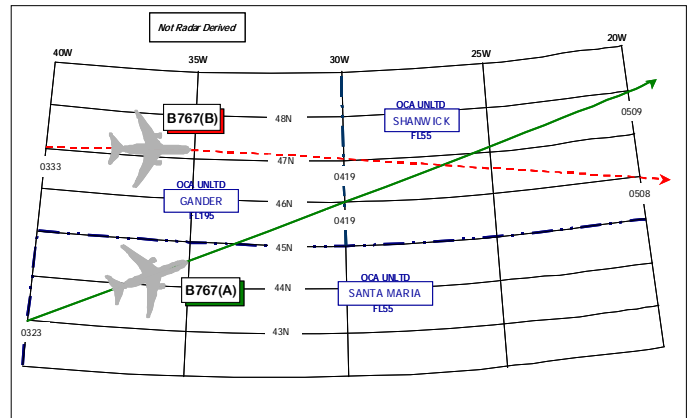
Visibility: NK NK

Reported Separation:

6nm H, Nil V NK

Recorded Separation:

NR

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

SHANWICK OACC ER3 CONTROLLER reports that B767(A), routing 43N40W – 46N30W – 48N20W, was co-ordinated between Santa Maria, Gander and Shanwick OACCs to climb to FL340 and be level by 45N. However, at 0431 a position report for 30W was received from the ac indicating that it was maintaining FL350. A priority message was sent to confirm the flight level and the flight profile was updated on FDPS [Flight Data Processing System] accordingly. The update indicated a conflict with B767(B), which was routing 47N30W – 46N20W at FL350. Consequently, B767(A) was instructed to descend immediately to FL340. The crew of B767(A) reported that they had been given climb to FL350 by Santa Maria and had “*passed within 6nm (of traffic) at 46N*”. When the flight profiles were checked at 0439, the subject ac had already passed each other. Initial enquiries with Gander confirmed that climb had been co-ordinated with Santa Maria at FL340 but Santa Maria reported that the flight was given clearance to FL350.

THE B767(A) PILOT reports that *he was in contact with Shanwick Oceanic maintaining FL350 at M0.86 and in VMC. A TCAS proximity, crossing target was noted at the same level and 6nm ahead. No avoiding action was taken.*

No report was received from the **B767(B) PILOT**.

ScOACC ATCI reports that B767(A), en route from La Romana (Dominican Republic) to Paris, was co-ordinated between Santa Maria, Gander and Shanwick to climb to FL340 prior to entering the SE corner of Gander’s airspace for approximately 180nm (22 min) before entering the Shanwick OCA. The ac incorrectly entered Gander’s airspace at FL350 and, subsequently, the Shanwick OCA.

At 0256 Shanwick received from Gander OACC a clearance for B767(A) that included the route portion 43N40W-46N30W-48N20W at FL330. At 0333 Shanwick received a position report from the B767(A) crew that they had crossed 43N40W at time 0323, level at FL330, estimating 46N30W at 0418 and requesting FL360. Since the ac was still within Santa Maria OCA and yet to enter Gander OCA, responsibility for approving the climb was not that of the Shanwick controller. However, anticipating that in due course Gander OACC would request the higher level, this was entered into FDPS at 0338. But FDPS showed a conflict with other traffic that would cross with only 5 min separation instead of the requisite 15 min.

Consequently, the ER controller re-entered the request with a revised level of FL350 but this showed a conflict with B767(B) against which only one min crossing separation would be achieved.

AIRPROX REPORT No 226/02.

Therefore, at 0339, the Shanwick ER controller entered FL340 for B767(A) and this showed no conflicts. Accordingly, B767(A) was provisionally cleared within FDPS to maintain FL340.

At 0342 Gander OACC contacted Shanwick ER2 controller by telephone to request a higher level, FL340, for B767(A), which at this point was maintaining FL330. FL340 was approved.

At 0431 the B767(A) crew reported having passed 46N30W at 0419, at FL350, estimating 48N20W at 0510. Since this was not iaw the agreed co-ordination, at 0433 the ER3 controller contacted the B767(A) crew, via Ballygirreen Radio Relay station, to confirm their FL. Gander OACC then telephoned ER2 in connection with the level of B767(A) stating that "*Santa Maria ... only climbed the ac to FL340*". ER2 responded that he was just receiving confirmation from the B767(A) crew that they were at FL350. So the Shanwick ER2 controller stated that he would descend B767(A) and, at 0437, sent a priority message, via Ballygirreen, instructing the crew to descend immediately to FL340. The pilot of B767(A) responded that he was leaving FL350 for FL340. However, by calculation B767(A) would have been closest to B767(B) at 0436, at which time it is estimated that minimum separation would have been one minute, equating to 8nm. Thereafter, the pilot of B767(A) reported level at FL340 at 0441.

Subsequently, at 0445, the ER3 controller queried with the pilot of B767(A) who had issued clearance for climb to FL350? The pilot replied that at 0349 Santa Maria OACC had instructed him to cross 45N level at FL350.

UKAB Note (1): An uncertified RT transcript of conversations between the 3 OACC Supervisors at 0443 reveals the Santa Maria Supervisor, making reference to B767(A), stating "*This flight it was co-ordinated at FL340 with Gander and by mistake we climbed the flight to FL350*".

ATSI concurs with the ScOACC ATCI report and adds that it is not known why it took 12 min between B767(A) passing 30W and receipt by the Shanwick ER3 controller of the position report; usually such messages are received within 2-3 min. It was noted, however, that other position reports associated with this flight reached

Shanwick at least 10 min after the reported position time.

Furthermore it was also noted that Shanwick had received a message from Santa Maria, which if acted upon would have shown that B767(A) was climbing to FL350. At 0349, the Shanwick Flight Plan Reception Suite Non-Active (FPRSNA1) support position received an RLS (Report Level and Speed) message from Santa Maria with the text '*c/sF330L350*'. The RLS message type is not recognised by FDPS and automatically defaults to the FPRSNA position, whose tasks include the re-direction/re-entering of incoming on-line messages to appropriate positions. At 0353, the FPRSNA1 re-input the RLS message in the form of a MIS (Miscellaneous) message and directed it to the ER2 controller. The FDPS Log records that ER2 deleted the MIS message without having actioned or queried it.

At the time of the Airprox there were no documented instructions for Shanwick controllers, with reference to RLS messages. However, TOI 67/02 (S) was issued on 28 Nov 02 and this states:

"1. INTRODUCTION.

Santa Maria radio have implemented a message to convey reports of Level and/or Speed changes.

The RLS message, Report Level and Speed, was developed and agreed by a sub-group of the NAT Systems Planning Group (NATSPG).

Santa Maria are the only radio station to have implemented the RLS message which is not recognised by FDPS.

2. MESSAGE FORMAT

The message contains the following fields:

Message Type

Callsign

Level(s) and/or Speed

A level followed by an L indicates the aircraft has reported leaving that level.

Field 18

Examples:

RLS-BAW1295-F330L350.CSF/VAJC1235

BAW1295 is leaving F330 for F350

RLS-DAL110-F370M086-CSF/

DAL110 is maintaining F370 and M086

3. PROCEDURES

3.1 FPRS/NA actions:

When an RLS message is referred to FPRSNA, the message is to be forwarded to the controller responsible for the flight as a MIS message.

3.2 Controller Actions:

On receipt of an RLS message, controllers are to check that the contents of the RLS message are in accordance with the FDPS flight profile. Any discrepancies are to be clarified with Santa Maria."

UKAB Note (2): The reported incident occurs outwith UK radar coverage.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included the reports from the pilots of B767(A), reports from the air traffic controllers involved and reports from the appropriate ATC and operating authorities.

It was disappointing that the pilot of B767(B), after being asked several times, had not provided a report. At the very least, the TCAS indications in his cockpit would have been useful to the Board. Nonetheless, sufficient information had been assembled to determine why these two airliners had lost over 90% of their expected time separation when they crossed at the same level.

It seemed from what was reported to have been said on the telephone, between the three OACC controllers after the incident, that the cause of the Airprox had been found; the Santa Maria Oceanic controller had, for whatever reason, apparently cleared B767(A) to climb to FL350 without seeking further co-ordination with either the

Gander or Shanwick controllers. There was no reason to doubt the veracity of what had been reported, but without a certified transcript of the telephone conversation the information was hearsay. What was factual was the message sent to Shanwick from Santa Maria nearly one hour before the conflict, showing that B767(A) was climbing to FL350. Unfortunately this message had been discarded unread and members debated whether or not this aspect had contributed directly to the final outcome. At length they thought it would be unreasonable to reach such a conclusion, persuaded by the lack of documented instructions at the time on such messages. Nonetheless, hindsight had exposed the lesson here plainly enough.

One factor that had contributed directly to the final outcome was the delayed reporting intervals from B767(A) crew, as highlighted in the ATSI report; e.g. 12 minutes had elapsed between the B767(A) passing 30W at FL350 and the position report being received by the Shanwick ER3 controller, when 2-3 mins was the norm. This late information had prompted action from the ER3 controller, through Ballygirreen Radio Relay. Even so, by the time the controllers involved realised the danger and had arranged for a priority avoiding action descent message to go out, again via Ballygirreen, the two airliners had already crossed tracks. Instead of being separated by 15min the time interval had reduced to just 1min, although members recognised that TCAS had remained in place throughout as the final safety net. This situation meant there had been little likelihood of the two aircraft ever colliding, but the safety margins on planned separation had been seriously reduced, indeed eroded to the extent that safety had been compromised.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Santa Maria Oceanic Controller apparently climbed B767(A) into conflict with B767(B), in breach of co-ordination agreed between Gander, Shanwick and Santa Maria OACCs.

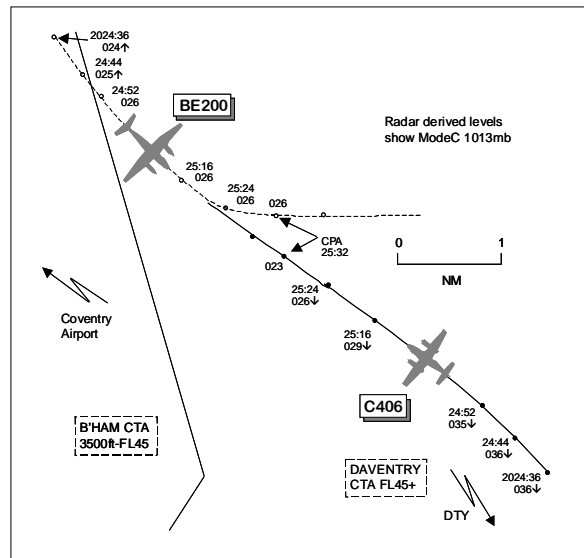
Degree of Risk: B

Contributory Factor: Significant elapsed time in receiving position reports from B767(A)

AIRPROX REPORT No 227/02.

AIRPROX REPORT NO 227/02

Date/Time: 19 Nov 2025 NIGHT
Position: 5220N 0120W (5nm SE Coventry - elev 281ft)
Airspace: London FIR (Class: G)
Reporting Aircraft Reported Aircraft
Type: BE200 C406
Operator: Civ Pte Civ Comm
Alt/FL: 2500ft 2500ft↓
(QNH 1010mb) (QNH 1010mb)
Weather VMC CLBC VMC CLBC
Visibility: 10km >10km
Reported Separation:
nil V, 400m H NR
Recorded Separation:
300ft V, 0.4nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BE200 PILOT reports that he had just departed Coventry RW05 on a DTY05 Departure. His ac was displaying navigation lights and HISLs, and was squawking assigned code with Mode C; TCAS was not fitted. Approaching the "CT" NDB, and climbing to initial altitude of 2500ft, he was cleared by the Coventry Tower controller to turn R to the Daventry VOR and instructed to call Birmingham on 118.05MHz. On calling Birmingham, and whilst flying at 2500ft QNH and 140kt, he was given an avoiding action L turn onto 090° owing to opposite direction traffic at his level. The other traffic's lights were seen during the turn, at an estimated range of 5km, slightly above and descending. The other ac started a L turn and passed 400m clear down his RHS. The risk of collision was assessed as "high".

THE C406 PILOT reports that he was heading about 350° inbound to Coventry, descending at 180kt. His ac was displaying navigation lights, ice inspection lights and HISLs. He was squawking assigned code with Mode C but TCAS was not fitted. He had just been transferred from Birmingham to Coventry Radar, who then provided a RIS. Birmingham had not informed him of conflicting traffic, and by the time Coventry had called it, he was visual with the other traffic, which he first saw at an estimated range of 3nm, and was assessing whether avoiding action was

necessary. The other traffic was just R of his ac's nose and apparently diverging, so he altered course by about 15° to the L. The pilot did not assess the minimum separation or risk level.

ATSI reports that both Coventry controllers described their respective workloads as light at the time of the incident. Whilst the BE200 was taxiing, the Coventry ADC obtained a departure clearance, in accordance with local procedures, from Birmingham Approach. Standard Routes are promulgated for ac departing from Coventry to join the airways system. The BE200 pilot was issued with a Daventry (DTY) 05 Departure i.e. "Via DTY VOR RDL 327° to DTY VOR (to be at FL60 by DTY VOR)". Birmingham Approach agreed to release the flight for departure but only to 2500ft. No reference was made about the C406, which by this time, the Coventry APR had agreed, with Birmingham, to accept inbound at 2500ft. Having passed the altitude restriction to the pilot, the ADC telephoned the APR to inform him of the departure to DTY at 2500ft. The latter asked if it was "one of ours or airways?" Ascertaining that the ac was routing via airways he responded "OK fine". No mention was ever made of the ac's c/s. It is possible that, if Birmingham had released the BE200 'subject your discretion (C406 c/s)' the ADC may have drawn this to the attention of the APR and more positive co-ordination may have

taken place. The BE200 was cleared for take-off at 2022:30.

The APR reported that he had been requested to act as the 'dedicated radar controller' for the C406, inbound to Coventry. He explained that Coventry Radar's hours of operation are promulgated (UK AIP Page AD 2-EGBE-1-6) as "Winter, Mon-Fri 1000-1715. All other times by arrangement." However, he added, it is standard practice, if a radar controller is available, to provide a radar service for IFR arrivals. In fact, just prior to being in position in the APR Control Room for C406, he had provided a radar service to another IFR inbound.

The Coventry APR received a telephone call from the Birmingham Approach Assistant, at 2020, requesting a level for the C406. He agreed an altitude of 2500ft for the flight and received a radar ident. Shortly afterwards, the C406 established communication with Coventry Radar reporting descending to 2500ft on a radar heading of 320°. For an inexplicable reason the APR believed that the ac was maintaining 2500ft and based any further action on that erroneous premise. (Coventry ATC is not equipped with SSR). The radar recording, taken from a source not available at Coventry, shows the C406 in CAS at the time, SE of DTY at FL73, where the base of the DTY CTA is FL65. He asked the pilot if he could accept a RIS. The pilot replied "*Affirm...and probably a visual approach*", whereupon, the controller instructed him to turn L ten degrees, as, alternatively, a heading for the start of the downwind leg or for RB on RW05. A RIS can be provided only to ac outside CAS and is defined in the MATS Part 1, Section 1, Chapter 5 Page 3, 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 ac whether or not the controller has passed traffic information....The controller may provide radar vectors for the purpose of tactical planning or at the request of the pilot.*" Although the APR did not realise that the C406 was in CAS, it should not have been provided with a RIS until it was within Class G Airspace (about three minutes later).

Just after the C406 made its initial contact, APR received the previously mentioned telephone call

from the ADC, concerning the BE200's departure. The APR explained that, when operating the Radar position outside the promulgated hours, fpps on departing ac were not routinely supplied to the Approach Control Room, due to staffing considerations. Consequently, he had no details on the BE200 and its c/s was never mentioned during co-ordination with the ADC. The only information he had ascertained about the flight was that it was routeing to DTY, at 2500ft, prior to joining airways. Approximately ten sec later, the APR telephoned the ADC to inform him about the next arrival, the C406, inbound via DTY at 2500ft but which was "*someway out though*". No mention was made of the potential confliction between the outbound BE200 via DTY at 2500ft and the inbound C406, via the same point, at the same altitude. The ADC said that he did not know the exact position of the C406 on the ATM at the time, as the ac had not been positively identified to him by the APR. He assumed that his colleague would be routeing it away from the outbound track, towards a RB position for RW05. The APR explained that he had believed that the telephone call he received about the outbound would be followed up later with another call when it was about to depart. In any case, as far as he was concerned, he was only providing a dedicated radar service (RIS) to the C406, having been delegated the flight by the ADC/APP. He considered that the ADC would be providing a combined ADC/APP Control service to the BE200 and would co-ordinate its departure with Birmingham Radar. The Coventry MATS Part 2, Page 4-1, states that: "*When radar is available at Coventry, the Approach Control and Approach Radar functions will be combined*". The APR reported that he regarded the term 'available' as meaning during the promulgated hours of operation. Outside this time he regarded it as a stand-alone APR service, applicable to designated ac only. This, he reasoned, was why he considered that the ADC and APP positions should have been operating as a combined function at the time.

The APR mentioned that, whilst in communication with the C406, he noticed that the Radar Vectoring Area (RVA) map was not displayed on his radar display. He explained that he used the map to positively establish when an ac enters the RVA, so that he could continue its descent to 2000ft. This map is particularly important for inbounds from the S, as there is little guidance on the radar display

AIRPROX REPORT No 227/02.

to be able, otherwise, to determine the boundary from that direction. Whilst trying to select the RVA he 'locked up' his display. To overcome this problem, he selected the RVA map on the adjacent console. Whilst being thus distracted and not having received, in accordance with local procedures, an ATD from the ADC, he did not notice straight away that the BE200 had departed. He only observed the ac on his radar display after it had turned R for DTY and, thereby, towards the C406. He immediately asked the ADC, via intercom at 2024:40, if he still had the outbound on frequency, and was informed that it had just been transferred (to Birmingham).

[UKAB Note (1): The radar timed at 2024:36, just before the call via intercom was made, shows the BE200 tracking SE at FL024 (2300ft QNH 1010mb). The C406 is passing FL036 (3500ft QNH), approximately 6.5nm away, on a conflicting north-westerly track.]

In accordance with the RIS being provided, the APR Controller passed traffic information to the C406 *"you may see traffic twelve o'clock range of five miles opposite direction on the airway climbing initially two thousand five hundred feet off zero five"*. The radar at 2024:52 shows that the subject ac were now 4.9nm apart, with the C406 above the BE200 by 900ft. The C406 pilot replied that he was visual with the traffic. As the flight had now entered the RVA, further descent to 2000ft was issued.

Simultaneously, as the Coventry APR made his TI transmission, the BE200 pilot called Birmingham Approach, after transfer from Coventry Tower. The Birmingham Controller immediately transmitted to the pilot *"avoiding action turn left heading zero nine zero traffic was twelve o'clock to you range of three miles reciprocal track it's a Shorts Three Sixty. Coventry are working the traffic inbound to them"*. He then telephoned Coventry saying: *"Stop that (C406 c/s)"*. [UKAB Note (2): the actual C406 c/s quoted (XYZ115) was incorrect, the numerical suffix being one less than the actual (XYZ116)]. The Coventry APR said that, not knowing the actual c/s of the departure, he initially thought that Birmingham were referring to the outbound ac. If he had realised that the C406 had been descending to 2500ft, rather than his erroneous assumption that it had been maintaining that altitude, he may have understood that the message referred to stopping

its descent. Consequently he replied *"I haven't got it, is that the one that's departed is it?"* (He reasoned that the C406 operator could easily have been using a trip number one digit out from the inbound flight.) Birmingham then corrected the c/s to which he replied *"at two thousand feet"*. Birmingham reported the outbound at 2500ft. Following a request from the Coventry APR, the C406's pilot reported passing 2200ft. As the pilot was visual with the traffic and below its level, the Coventry APR was confident that all risk of a collision had now been removed. The radar, timed at 2025:24, shows the subject ac head on, 1.2nm apart, with the C406 descending through the BE200's level. Thereafter, the CPA is reached, at 2025:32, when the BE200 is in the L turn in response to the avoiding action instruction. The C406 is 300ft lower, passing down its RHS, 0.4nm away.

As a result of this incident, a Coventry Supplementary Instruction (SI 09/02), dated 26 November 2002, was issued to address the provision of radar services. This confirms that, *"Whenever an approach radar service is provided at Coventry, the Approach Control and Approach Radar functions will be combined"*. Other salient points include: *"Account of all traffic that is likely to conflict with that receiving an approach radar service is to be made"*. The Approach Radar Control function includes the responsibility: *"To issue radar derived instructions in-order to de-conflict aircraft (either direct to ac on frequency or via aerodrome control) that are likely to conflict with aircraft already receiving a service from approach radar control (this includes traffic in receipt of either a FIS, RIS or RAS)"*.

Of pertinence to this incident, the MATS Part 1, Section 1, Chapter 3, Page 1, states that: *"Standard vertical or horizontal separation shall be provided, unless otherwise specified, between: IFR flights in Class G airspace being provided with a service by an approach control unit"*.

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 clear that there had been a breakdown in teamwork within Coventry ATC. The APR was under a misapprehension that he was providing a dedicated service (RIS) to the inbound IFR C406 and had fulfilled his responsibilities by providing TI on the outbound IFR BE200. However, the Board believed that the APR had been providing an inappropriate service at the time. Although the APR had expressed doubt that the functions of APP and APR were combined, he was aware of the outbound Beech routeing in the opposite direction towards DTY at the same altitude. Moreover, he had made two erroneous assumptions. Firstly, that the C406 was level at 2500ft when it established communications and secondly, that the ADC would check with him before releasing the BE200. Without knowledge of the Cessna's descent profile, at the time the APR gave it descent clearance to 2000ft, the Cessna was still above the Beech and descending into conflict. Additionally, had the APR co-ordinated with the ADC in a more positive manner, the Beech would not have departed without his knowledge. Arguably, if the ADC had passed the APR an ATD, in accordance with the local instructions, the APR would have been aware that the BE200 was airborne before it was transferred to Birmingham and may have noticed the conflict earlier. Conversely, the ADC could also have been more pro-active. After he was informed by the APR of the next inbound from the DTY area at the same level as the outbound Beech, he could have asked the APR if he wanted to work the Beech rather than assuming that the C406 would be routed clear of its departure track. Although the C406

was not identified to the ADC, reference to the ATM would have shown the C406 tracking towards Coventry in potential conflict. The Board were clear that the Airprox was caused because the Coventry ATC team had released the BE200 into conflict with the C406.

Although TI had been passed by the APR to the C406 pilot, its pilot had already seen the BE200, he thought 3nm ahead and just to the R of his ac's nose, and assessed that a small turn to the L was required to avoid. However, the BE200 pilot was unaware of the conflict until he contacted Birmingham ATC when he was given an avoiding action L turn onto E with TI. He saw the lights of the C406 whilst in the turn, above but descending, and watched it turn L and pass about 400m away to his R. The radar recording shows the subject ac 1.2nm apart, the C406 descending at >2000fpm through the level of the Beech, with the latter just starting its L turn. Although the visual sightings and late turns ensured that the ac were not going to collide, the subject ac had passed in unnecessarily close proximity at night which led the Board to conclude that safety had been compromised during the encounter.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Coventry ATC team released the BE200 into conflict with the C406.

Degree of Risk: B

AIRPROX REPORT No 228/02.

AIRPROX REPORT NO 228/02

Date/Time: 22 Nov 1047

Position: 5105N 0218W (2nm NW of ADSON)

Airspace: London FIR (Class: G)

Reporting Aircraft Reported Aircraft

Type: BAC 1-11 Hawk

Operator: DPA HQ STC

Alt/FL: FL175↓ ↑FL200

Weather VMC CLOC IMC in Cloud

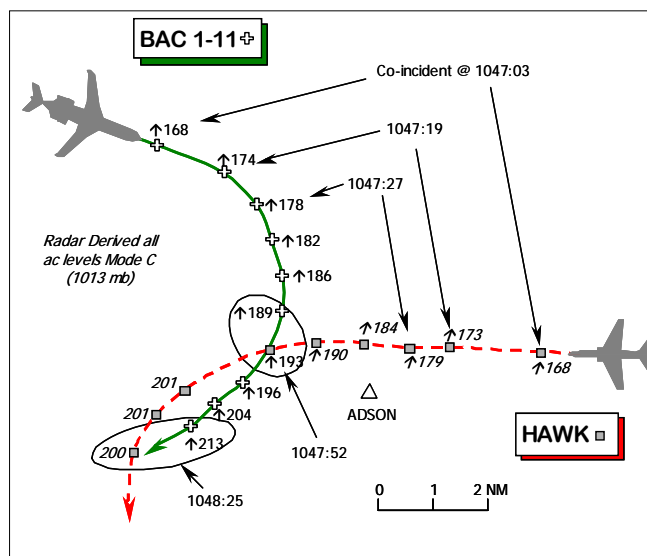
Visibility: NK NK

Reported Separation:

Unknown Not seen

Recorded Separation:

0.75nm H, 400ft V



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BAC 1-11 PILOT, a QFI flying with a student pilot, reports his ac has a red/white & blue colour scheme and the HISL was on whilst conducting a trial under a RIS from Boscombe RADAR (RAD) on 276.85MHz. A squawk of A2607 was selected with Mode C, but neither TCAS nor any other form of CWS is fitted. He was flying 1000ft above and 1500m clear of cloud at the time of the Airprox, but the in-flight visibility was not known.

Whilst climbing through FL175 at 300kt, about 20nm W of Boscombe turning R through 180° to remain clear of cloud, he spotted a Hawk ac at 1 o'clock – 200m distant - heading away to the west from L to R and slightly below his ac. It appeared that the two ac's flight paths must have crossed extremely close to each other, although he could not determine the precise distance. The Hawk ac did not alter course and did not appear to have seen his ac. No avoiding action was taken because both ac had passed by the time the Hawk was spotted. He assessed the risk of a collision as "high".

THE HAWK PILOT reports his ac has a black colour scheme and the HISL was on whilst on a dual sortie under a RAS from RAD, also on 276.85MHz. A squawk of A2620 was selected

with Mode C, but neither TCAS nor any other form of CWS is fitted.

After departure from Boscombe Down, climbing in cloud, IMC, about 15nm W of the aerodrome heading 270°(M) at 420kt, ATC instructed him to turn L onto 180° for avoiding action, just as he was approaching his intended level of FL200. Upon rolling out on the assigned heading of 180°M, still IMC, he heard the BAC 1-11 crew report an Airprox on the frequency. The BAC 1-11 was not seen at all by either of the Hawk pilots, as they had been IMC in cloud throughout. He was unable to quantify the risk.

MIL ATC OPS reports that the BAC1-11 crew was operating under a RIS from RAD to the W of Boscombe Down operating in a block FL100-200. [UKAB Note (1): The position was manned by a trainee and qualified mentor, who assessed the workload as light with only the BAC1-11 and Hawk under service.] The Hawk pilot reported airborne and was instructed to "...climb report established in the block 3000 feet to FL160 Portland pressure [RPS] 983", which the pilot acknowledged. At 1044:25, the flight was identified by RAD and placed under a RAS. At 1044:50, the Hawk pilot was instructed to "...turn right heading 270°, report VMC on top". The Hawk pilot reported

steady on W and about two min later at 1047:22, RAD passed traffic information about the Hawk to the BAC1-11 crew, "...traffic south east, 5 miles, west bound, Hawk indicating FL175 under my control". The mentor reports that at that point the BAC1-11 was tracking 100° on a shallow converging heading against the Hawk maintaining 270°; it appeared that not less than 3nm horizontal separation would be achieved on those headings. However, following a R turn by the BAC1-11, RAD transmitted at 1047:33, "[Hawk C/S] *avoiding action turn left heading 180 traffic right 1 o'clock 3 miles crossing right-left BAC1-11 indicating FL180*". Ten seconds later RAD enquired if the Hawk pilot was still IMC, which he confirmed. After requesting a change in his operating levels at 1047:59, the BAC1-11 pilot was released by RAD to fly in the block FL160-FL240. Later the BAC1-11 pilot questioned "...where is the Hawk in relation to us?" RAD responded that the Hawk was "...west...2 miles". The BAC1-11 pilot queried RAD about the ATS that the Hawk crew was operating under and advised that "...he came extremely close to us". At 1049:00, the BAC1-11 pilot reported that he was "...going to be declaring an Airprox on that traffic".

Looking at the projected tracks at 1046:00, the contacts would have remained separated by about 3nm, with the BAC1-11 in the Hawk's R 1 o'clock at 16nm. After RAD passed traffic information on the Hawk to the BAC 1-11 pilot, the mentor was surprised that the latter elected to turn R towards the Hawk. However, a replay of the radar recording reveals that the BAC1-11 crew had already commenced the turn when the traffic was called. It is apparent that the avoiding action L turn was issued immediately the conflict was perceived by the controller. Unfortunately, the Hawk's reaction only becomes apparent 20 sec later, during which 2¼ miles were covered. Nevertheless, here under the RAS, the onus was on the controller to provide a minimum of 3nm horizontal separation between his ac. With the foreknowledge of the BAC1-11's operating area/level block and flight profile (it had been flying a series of racetracks to the west) it would have been prudent if the controller had taken more positive control by manoeuvring the Hawk toward a different operating area. Instead by attempting to take 3nm horizontal separation against manoeuvring traffic the controller exercised poor judgement. Appropriate action has been taken.

However, the Hawk pilot who took so long to initiate the avoiding action turn did not help him.

[UKAB Note (2): At 1044:33, the Clee Hill radar video recording shows the Hawk 3nm SW of Boscombe Down, tracking 240°, climbing through FL34 Mode C, at which point the BAC 1-11 has turned onto an easterly heading and is indicating FL150. At 1046:22, the BAC 1-11 appears to be tracking 100°, which placed the Hawk in the pilot's 12 o'clock – 12.6nm. Moments before RAD passed traffic information to the BAC1-11 crew at 1047:22, the BAC1-11 is in a R turn and the Hawk is 5.2nm SE, climbing through FL173. The next radar return at 1047:27, shows the Hawk indicating FL179, 100ft above the BAC1-11, which is R 1 o'clock – 3.75nm, indicating FL178. The tape transcript timings correlate with those of the radar recording. When avoiding action was issued to the Hawk pilot (1047:33,) the BAC1-11 was R 1 o'clock – 2.48nm but a turn is not evident until 1047:52, some 20 sec after the instruction was transmitted and even then it was quite shallow. At that point, the BAC 1-11 was still in a R turn with the Hawk about 0.75nm to the SSW – the point of minimum horizontal separation – and 400ft above it, turning L. The outcome of both turns brought the Hawk back through the BAC1-11's 12 o'clock at a range of about 1.12nm at 1048:25, now separated by 1300ft, because of the BAC1-11's continued climb. Thereafter the BAC 1-11 continues to the W and the Hawk S, whence the separation increases.]

THE CREWS' STATION comments that in addition to the ATC aspects, there were a number of aircrew related factors; ATC and the aircrew involved met to discuss the issues. The Hawk was instructed to operate between 3000ft RPS and FL160. The Airprox occurred at FL175, and the pilot stated in his report - but not to ATC - his intention to climb to FL200. The Hawk pilot appears to have broken his 'contract' with ATC under the RAS. However, he understood that the ATC instruction to "*report VMC on top*" meant that the block no longer applied. Moreover, the incident might still have occurred if the Hawk captain had stayed within the declared block, since the BAC1-11 was initially operating (as previously approved by ATC) in a block FL100-200. There is an apparent anomaly in the meteorological conditions reported by the pilots. The BAC1-11 pilot reported a visual sighting of the Hawk in VMC, but the Hawk pilot reports being

AIRPROX REPORT No 228/02.

IMC in cloud throughout. At the time of the incident, the BAC1-11 was operating in a bowl of clear conditions surrounded by cloud with very little horizon, and with high level cloud overhead. A pilot flying into this bowl at altitude on instruments would not necessarily perceive this as a change in flight conditions. RIS and RAS are basically incompatible services, particularly under IMC. Under RIS, the BAC1-11 was wholly responsible for maintaining separation from other ac, and there was no breakdown of ATC responsibilities towards this flight. The BAC1-11 captain accepts that he should have taken a greater interest in the position of the Hawk, but RAD's words "...traffic south east, 5 miles, west bound, Hawk indicating FL 175 under my control", lulled him into a false sense of security.

The Unit has learnt a number of lessons from this incident, none of them new. These lessons have been given wide publicity throughout the Station.

DPA comments the Station has conducted a very thorough and effective review of the circumstances, which resulted in this Airprox. This review identified the root cause but also exposed a number of other related issues.

Undoubtedly, the trainee and screen controllers did not plan, monitor and act appropriately. The Unit's view that RADAR did not provide the required separation implicit in the RAS contract with the Hawk pilot is, indeed, correct. The incident was further compounded by the crew of the BAC 1-11 not sighting the Hawk until after the encounter had occurred.

The point regarding the incompatibility of RAS and RIS are well made by the Unit and, given the weather conditions described, it might have been more apposite for the BAC 1-11 crew to have operated under a RAS as well.

HQ STC comments that it is important that the salutary lessons re-identified here are noted by all in the aviation community: ATCOs should think 3D and take early action - keeping a height cap on the Hawk might have been an easy solution. For aircrew - are you truly VMC with no horizon and minimal cloud separation? How much opportunity are you giving for 'see (and also be seen) and avoid' to be effective? What safety margins have you allowed?

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available to the UKAB 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.

A controller member disagreed with the view that RAS and RIS are incompatible. In the light traffic environment that applied here, he opined that a competent controller can apply both services effectively and this was a routine scenario that confronts controllers daily in many ATSU's throughout the UK FIRs. A RIS might well have been appropriate for the trial being conducted, but if the BAC1-11 crew had realised that the weather conditions were not conducive to visual sighting and separation, then RADAR should have been informed and an upgraded ATS requested, which was an important lesson for all aircrew and worth mentioning here. The Mil ATC Ops Advisor explained that RADAR's plan was to apply 3nm horizontal separation between the two ac - the minima specified under the RAS that applied to the Hawk in this terminal environment. This would have just been achieved if the BAC1-11 crew had not turned about on their trial when they did. Furthermore, the Board was briefed that the mentor had indeed expected the Hawk pilot to climb above FL160 whilst seeking to achieve 'VMC on top' and thereby exceeding his briefed level, which concerned controller members. It was evident that traffic information had been given to the BAC1-11 crew about the Hawk under the RIS that pertained, but this was transmitted after the crew had initiated their turn about westward of their own volition. RADAR should have been expecting this turn on the established trial profile, which the BAC1-11 crew was perfectly at liberty to initiate at any stage, because at that point they had no knowledge of the Hawk climbing rapidly towards them. In the Board's view the BAC1-11 crew might not have made the R turn if they had been told about the Hawk earlier, but there was no assurance of that and there was a fine balance to be struck as to when this traffic information should be issued. It appeared to some, that RADAR had assumed that the traffic information given to the BAC1-11 crew might induce them not to turn toward the Hawk, whereas it had been shown they

had already initiated the turn and more positive and urgent action was demanded by the jets' close proximity. Expecting the BAC1-11 crew operating under 'see and avoid' to remain clear of the Hawk was, to some controller members, poor technique and RADAR should have ensured that standard separation was not eroded between the only two ac under his control at the time. Moreover, no indication was given to the BAC1-11's crew, within the traffic information given, that the agile Hawk was climbing rapidly toward their ac and controller members were critical of the overall content of this 'message', which did not 'paint the whole picture'. Members also thought the phrase "...under my control" might also have influenced the crew unduly. Whilst the trainee controller might have chosen the words used here, it was up to the mentor to ensure that the service was applied safely. Many options were available to RADAR to achieve this. HQSTC had identified one, but with two apparently conflicting operating blocks and the Hawk wishing to climb rapidly to achieve VMC so that the pilots could commence their exercise, positive action was required. RADAR had chosen the Hawk's westbound vector, and it might have appeared that standard separation would be maintained, but that alone would not guarantee separation against the BAC1-11, which was free to manoeuvre. 'Locking' the BAC1-11 onto a heading for a short while until the two ac had passed was another way of preventing this entirely avoidable Airprox, if RADAR wished to permit the Hawk to climb through the former's level safely. This Airprox was a salutary lesson to all controllers on what can occur if positive action is not taken to restrict ac when necessary. In the Board's view, this was indicative of poor planning on the part of RADAR (specifically the mentor who was responsible for his trainee's actions) who did not exercise early and positive control over the situation. RADAR had not taken action to ensure safe separation

between these two ac as the Hawk pilots could reasonably have expected under the RAS; if this service had been applied correctly the conflict would not have occurred and the Board agreed that this Airprox was the result of RADAR allowing the Hawk to fly into conflict with the BAC1-11.

Turning to the inherent risk the Hawk crew was climbing in cloud under IMC and did not see the BAC1-11 at all, whereas the latter's crew only saw the small jet after their paths had crossed for the first time. The radar recording showed that the Hawk passed about 0.75nm ahead of the BAC1-11, but was already 400ft above the latter at this point. Fortunately, the BAC1-11 was also climbing at the time because the radar showed that moments later the Hawk pilot had levelled at about FL200. The radar recording clearly illustrated the potential for a second conflict which would have ensued after the Hawk turned L in compliance with the avoiding action issued by RADAR, (pilot members opined that the allegedly wide turn was a rate one turn because of the weather conditions) if the BAC1-11 had not itself continued climbing above the Hawk and thereby outside of the BAC1-11 crew's allocated operating band. This continued climb was purely fortuitous and not the result of any premeditated avoiding action. Whilst here the prevailing circumstances had precluded an actual collision, in the Board's opinion the safety of these two ac had not been assured.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Boscombe Down RADAR did not apply the RAS correctly and allowed the Hawk to fly into conflict with the BAC1-11.

Degree of Risk: B.

AIRPROX REPORT No 229/02.

AIRPROX REPORT NO 229/02

Date/Time: 25 Nov 1424

Position: 5242N 0117E (1.3nm N of Norwich Airport - elev 117ft)

Airspace: Norwich ATZ (Class: G)

Reporting Aircraft Reporting Aircraft

Type: Tornado F3 x3 S76

Operator: HQ STC Civ Trg

Alt/FL: 1000ft (Coltishall) 1000ft(Norwich)
QFE 1002mb) QFE 1000mb)

Weather VMC CLBC VMC CAVOK

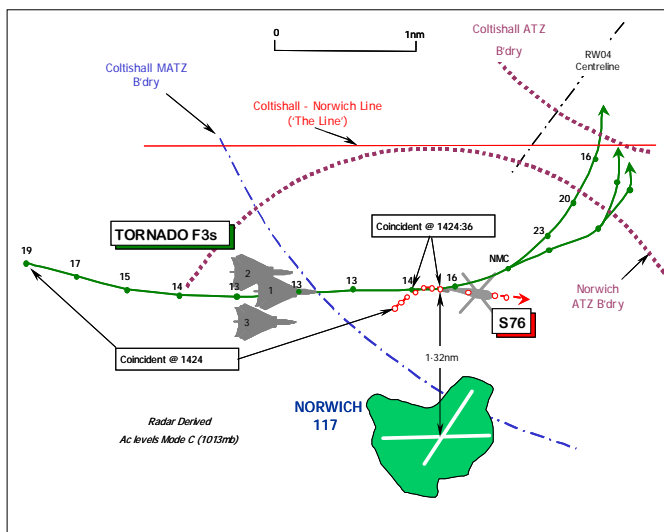
Visibility: 10km 10km

Reported Separation:

0.25nm H, Nil V 0.5nm H, 300ft V

Recorded Separation:

Not recorded



BOTH PILOTS FILED

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE TORNADO F3 FORMATION LEADER provided a very comprehensive report, stating that his formation of 3 Tornado F3s was on a weather diversion at the end of a 6hr transit flight from Akrotiri Cyprus and being positioned by Coltishall APPROACH (APP), under a RIS, for a radar-to-visual approach to RW04 at Coltishall. All 3 ac were camouflaged grey and the HISLs were selected on. Flying in arrow, the formation No 2 was 30° swept L at 50m and about 50ft below the leader, and the No 3 was 30° swept R at 150m at the same height as the leader. Flying at 400kt and level at 1000ft Coltishall QFE (1002mb), the formation was turning L at 45° AOB, onto a radar hdg of 080° when ATC advised of helicopter traffic. Although the call was missed by the leader due to an intra-formation transmission on another frequency, No 3 heard the call and asked for confirmation from ATC, who repeated the traffic information advising of a helicopter operating not above 500ft. At this point the leader achieved visual contact with Coltishall aerodrome, instructed a formation frequency change to Coltishall TOWER and initiated a L turn toward the aerodrome. Almost immediately the helicopter was seen dead ahead, at or very near to the

formation's height and the range was rapidly closing. At this point he was unsure of the helicopter's heading, but then assessed that it was tail-on and that they were approaching it from astern. Immediate avoiding action was necessary as he was concerned that his RH wingman (No 3) would collide with the helicopter. At the same time the LH No 2 also saw the helicopter and similarly assessed that the formation would fly close to the helicopter and that the RH No 3 would pass extremely close. The leader transmitted "pull up" just as No 2 transmitted "helicopter 12 o'clock, break." Both of these transmissions were made during the change to TOWER's frequency that was being dialled-up by the navigators within the formation ac. Consequently, neither of these transmissions was heard by the No 3 crew, who never saw the helicopter. The leader and No 2 both pulled up immediately, whilst No 3, who was unsure as to what the lead and No 2 were doing, rolled R and then pulled up. After the formation break to avoid the helicopter, individual visual arrivals were co-ordinated into the Coltishall Cct and an Airprox was reported to TOWER. He did not see how close his No 3 came to the helicopter, but the No 2 stated that there was very little lateral

separation between them and estimated the minimum horizontal separation as ¼nm at the same height with no vertical separation. Both the lead and No 2 assessed that there was a high risk of collision.

THE S76 PILOT reports that his ac was coloured red, white and blue and that anti-collision beacons, white HSL and position lights were all selected on. He was conducting a training flight, which included simulated emergencies at Norwich Airport and was in contact with Norwich TOWER on 124.25MHz. Since Coltishall had inbound traffic, the RW27RH Cct direction was 'Restricted', which curtailed the Cct to no more than 1.25nm from the airport. At 0.8nm N of the Airport, heading 090° at 1000ft Norwich QFE (1000mb) and flying at 100kt, 3 Tornado F3s were spotted at 8 o'clock, about ½nm away and 300ft above his helicopter, by a 3rd pilot who was sitting in the passenger compartment. The Tornados flew a similar heading before they broke L. No avoiding action was taken, as the flight crew could not see the Tornados.

THE NORWICH AERODROME CONTROLLER (ADC) reports that he was busy working a complicated traffic pattern with the visual Cct on RW27 active in a LH direction. The S76 was operating on the 'November' taxiway in a 27 direction doing 'restricted' RH circuits – ie below 1000ft remaining within 1.25nm of the RW – as advised by the Norwich APPROACH RADAR controller (APR). He subsequently learnt that one of 3 Tornado F3s inbound to Coltishall RW04 had filed an Airprox on the helicopter.

THE NORWICH APPROACH RADAR CONTROLLER (APR) located in the Approach Control Room at Coltishall, reports that she was advised by Coltishall APP of 8 Tornado F3s that were diverting into Coltishall because of poor weather at Coningsby. It was expected that the Tornados would make PAR approaches to RW04, so APP requested that the S76 operating a RH Cct on RW27 at Norwich be 'restricted'. Although unable to recall the exact phrase used, she understood APP meant that the Norwich Cct height should be restricted to 500ft, in accordance with the local agreement for Coltishall RW04 PAR approaches. Accordingly she instructed Norwich ADC to restrict the Cct in height and azimuth. The helicopter was observed to comply laterally, as the

restrictive line is displayed on the radar video map.

The inbound tracks of the Tornado F3s to Coltishall RW04 were closely monitored, as there were 2 IFR departures from Norwich that the ADC wished to release. Both departures were delayed slightly as she was not satisfied that the Tornado F3 inbound tracks were remaining to the N of the Coltishall E-W line as required by local agreement. After co-ordination with Coltishall APP and Director (DIR), the Norwich IFR departures were released. However, on both occasions the inbound Tornados drifted S of the agreement line and Coltishall APP and DIR had to be requested to turn the F3s from the Norwich departure path. There was no loss of separation, but she was more concerned about this than the subsequent Tornado manoeuvres within the Norwich ATZ, as she believed that the S76 was operating at 500ft. Consequently, Norwich ADC was not alerted to the confliction. Moreover, despite her belief, to the contrary, the S76 was entitled to be operating up to 1.25nm N of RW27 centreline at 1000ft in a 'restricted' circuit whilst ac recover to Coltishall RW04 visually. It is only during PAR approaches to Coltishall RW04 that helicopters N of Norwich RW27 need to be restricted to 500ft.

MIL ATC OPS reports that the three-ship Tornado formation was inbound to Coltishall for a radar-to-visual approach under a RIS from APP. The formation leader established contact on 315.32MHz at 1420:40. [UKAB Note (1): Cross reference between the Coltishall RTF tape transcript and LTCC radar recording times indicates that Coltishall RTF tape transcript times are in error by 1min 15sec; accordingly, for clarity, RTF transcript times have been correlated to that of the radar recording.] Having been identified and placed under RIS, the formation was cleared for descent, initially to 2500ft Coltishall QFE (1002mb) and then, at 1421:27, to 1500ft. However, at 1422:54, the formation leader reported levelling off at 2500ft stating that he was "... *not convinced we're gonna be VMC at 1000ft...*" and adding that the formation was just clearing a cloud bank and would be ready for further descent thereafter. APP responded that previous ac had become visual with the aerodrome at 1000ft, qualifying this with "... *but, er, continue at your discretion.*" APP then advised the formation leader that there was no radar

AIRPROX REPORT No 229/02.

traffic ahead, although a similar type was in the Coltishall visual circuit. This was followed, at 1423:39, by an instruction to turn L onto 090° together with a request to report ready for further descent. The formation leader acknowledged the turn instruction and reported descending to 1000ft QFE. At 1424:00, APP issued a further L turn onto 080°, which was qualified with traffic information "... helicopter traffic north side of Norwich Airport, just to the SE of you by 3nm, should be at 500ft". APP added, shortly afterwards, "He's operating VFR". A response from the formation requested APP to repeat the traffic information and APP transmitted "12 o'clock at 1nm, helicopter believed to be at 500ft operating N side Norwich visual circuit". At 1424:25 the formation leader reported level at 1000ft QFE and 4 sec later reported "visual with the field". APP responded, at 1424:31, "Roger, the 1 in [the Coltishall Cct] I believe, has just landed. Continue with Coltishall TOWER 339.95." At 1424:37, the leader instructed his formation "339.95, mains go" followed, 2 secs later, by "Pull up, pull up"!

A LOA between RAF Coltishall and Norwich Airport defines Joint Operating Procedures (JOPs), one of which states that "RAF Coltishall will endeavour to operate from RW22 unless overriding meteorological conditions or operational requirements necessitate the use of RW04". On this occasion, the surface wind, although light, gave an unacceptable tailwind component for Coltishall-based ac, hence the selection of RW04. Moreover, JOPs also define 'The Norwich - Coltishall Line (The Line)'. JOPs require that "the Coltishall controller is to notify the [Norwich APR] of all traffic inbound to Coltishall that will pass within 15nm of Norwich Airport whilst south of the Norwich Coltishall line". In this case the Tornado formation approached from the NW and the Norwich APR was aware of the traffic before it encroached S of the 'The Line'.

APP had been advised that a total of 8 ac were diverting into Coltishall because of adverse weather at Coningsby, their intended destination. One specifically requested a GCA although the type of recovery for the remainder could not be confirmed until they came on frequency. Nevertheless, in anticipation APP negotiated an agreement with the Norwich APR, whereby APP understood that helicopter operations N of Norwich would be operating not above 500ft and

that this would remain in force until all diverting ac had been recovered. However, there is no radar-to-visual procedure for RW04, for which ac may join either visually or via a GCA. The formation leader was not advised that the procedure was not available for RW04 and also no brief was given on how a visual recovery was to be effected or on the proximity of Norwich Airport. Nevertheless, as the formation was diverting after a long transit flight, it was, perhaps, more prudent to vector the formation to a position more conducive to visual acquisition of Coltishall rather than risk overloading the leader with such administrative detail. Alternatively, even though the weather colour code was 'Blue', signifying a minimum cloud base of 2500ft agl and visibility of 8km, APP was aware that the previous ac had only achieved visual contact with Coltishall at 1000ft. Therefore, with the benefit of hindsight, it may have been better if the formation been positioned for an instrument recovery, however this may have further disrupted Norwich's operations.

As it was, APP persisted with radar vectoring for a visual join. In his responsibilities under RIS, APP passed traffic information on the helicopter qualified by "should be at 500ft" and "believed to be at 500ft", as was his understanding. Unfortunately, the S76 displayed no SSR Mode C to substantiate this belief. Moreover, it is apparent from the radar recording that the formation was slow to initiate the L turn onto 090°, which, although not preventing a crossing of 'The Line', nevertheless exacerbated the situation.

It would appear that a misunderstanding of the vertical restriction imposed on the helicopter precipitated the Airprox. As a result, the Unit has taken appropriate action to ensure all controllers are mindful of extant procedures and, in concert with Norwich ATC, is conducting a review of those procedures to ensure the removal of any ambiguity.

ATSI reports that the Norwich APR described her workload as increasing from light to moderate in the period leading up to the Airprox. She explained that the increase was the result of extra co-ordination necessitated by the diversion of 8 Tornados into Coltishall. She overheard the military controllers discussing the diversion before Coltishall APP, seated immediately to her R, informed her that these ac would probably be carrying out a PAR to Coltishall RW04. Therefore,

the S76 helicopter, previously noted operating in the Cct to the N of Norwich Airport would need to be 'restricted'.

The Norwich MATS Pt 2 describes the Joint Operational Procedures, referred to in the LOA between Norwich Airport and RAF Coltishall. The aim of the procedures is to *"integrate safely and expeditiously, traffic operating at RAF Coltishall and Norwich Airport, allowing maximum operational freedom."* The procedures are primarily dependent on the RW in use at Coltishall. One stipulation is that *"Coltishall traffic is not to penetrate the Norwich ATZ unless co-ordination has been agreed"*. In addition to the general operating procedures, instructions are included that apply when helicopter training takes place to the N of Norwich. On this occasion, the S76 was operating RH circuits on RW27 at Norwich Airport, in communication with Norwich TOWER.

Relevant entries in the Norwich Airport MATS Pt 2, SI 02/02, state the procedures for helicopters operating circuits N of the airport:

"1a. Helicopters need to fly circuits to the North of RW09/27 at Norwich. If RAF Coltishall is active the following conditions will be met:

i) The helicopters will remain south of a line 1.25 nms. north of runway 09/27. This line (displayed in red on the radar video map) lays parallel to the existing Norwich Coltishall line (see vii below)... This will create a buffer zone of some 1.25 nms depth.

ii) Helicopters will only operate Northside at Norwich if they are flying under Visual Flight Rules AND the cloud base is 600ft or more and the visibility is 2000m or more.

iii) Normally the northside circuit will not be flown above 1000ft Norwich QFE. Circuits higher than 1000ft or wider than 1.25nm are only to be granted subject to agreement of Coltishall ATC.

iv) The Norwich Aerodrome Controller will advise the Norwich Approach Controller (NAC) in sufficient time that the Coltishall Approach Controller (CAC) can be informed.

Coltishall using RW04 – Visual Recoveries

vii) Coltishall ATC will inform inbound visual recoveries and circuit traffic of the Norwich helicopter operations. Coltishall traffic will remain north of the existing Norwich Coltishall line." The Norwich Coltishall Line (The Line) is defined in the Norwich MATS Part 2 as: "This is a line running East/West equidistant from the Norwich and Coltishall ATZs centred on a point 5242.7N 001.19.1E". It is marked on the radar video map.

viii) Norwich will inform the helicopters that Coltishall RW04 is active and that ac will be operating north of RW27.

Coltishall using RW04 – Instrument recoveries

ix) Coltishall will inform inbound IFR recoveries that Norwich helicopters are operating not above 500ft Norwich QFE.

x) *Norwich will inform the helicopters that Coltishall RW04 is active and to remain within the Aerodrome Boundary not above 500ft Norwich QFE. (This restriction can be removed when Norwich ATC can positively determine that the IFR traffic has passed beyond the helicopters)". Additionally, because the various restrictions are rather long-winded to spell out to aircraft each time they operate northside, the following procedure has been adopted and is included in the LOA: " **Codewords have been allocated to the various circuit restrictions but are applicable only to aircraft operated by [3 companies including that of the S76] helicopters. Any other helicopters must have the restrictions spelled out fully prior to operating on the northside.***

The following codewords are in use:

a. **UNRESTRICTED.** No restrictions, RAF Coltishall traffic is not affecting Northside operations

b. **RESTRICTED.** Not above 1000ft QFE and no further north than a line parallel to **and** 1.25 nm north of the centreline of RW 27/09. RAF Coltishall traffic arriving or departing RW22 (instrument & visual) or visual joins to RW 04

c. **LOW LEVEL.** Not above 500ft QFE and remain within the airfield boundary (defined as no further north than a line joining the RW 22 threshold to the

AIRPROX REPORT No 229/02.

disused RW 18 threshold). RAF Coltishall have instrument recoveries to RW 04.”

In accordance with the foregoing procedures, the S76 had been notified to Norwich APR and Coltishall APP as operating northside at Norwich. Accordingly, when Norwich APR was informed that the diverting Tornados would probably be making an instrument approach to RW04, she telephoned the ADC intending to instruct him to restrict the S76's circuit to 'low level' i.e. remaining within the Aerodrome Boundary not above 500ft Norwich QFE. However, for an inexplicable reason, she did not use the correct 'codeword'. The transcript of the telephone conversation, timed at 1400, reveals that the following dialogue took place between the 2 Norwich controllers:

APR: *“Erm, N of the, erm, RH circuit to be, er, restricted in, erm, level and”*

ADC: *“OK”*

APR: *“The other”*

ADC: *“Yeah, right oh”*

APR: *“Yeah”*

ADC: *“Restricted in in all all forms”*

APR: *“In all the, in all senses yeah”*

The result of this exchange was that APR believed she had taken appropriate steps to restrict the S76 to 'low level' and she informed Coltishall APP accordingly. Conversely, Norwich ADC, acting on the understandable belief that APR intended that S76's circuit should be '**restricted**' (the actual word used) to not above 1000ft and within 1.25nm, had informed its pilot accordingly. APR mentioned that she observed the S76 on her radar display, whilst in the circuit at Norwich, but was unable to establish its height as it was not showing Mode C. However, she commented that she noticed it N of the airport boundary, but just S of the 'red line'. Its positioning should have provided a clue to the fact it was operating outside the stipulated parameters of 'Low Level'.

When it was decided that the Tornados would carry out a visual recovery, rather than an instrument, approach to Coltishall RW04, the Norwich APR was informed accordingly.

However, she opted to maintain what she believed was the 500ft 'Low Level' restriction agreed with ADC, in case they might, subsequently, have to make an instrument approach. Consequently, she did not inform the ADC of the change of plan. Had she done so, it is possible that the type of circuit being performed by the helicopter would have become apparent. APR explained that the inbound Tornados were split into 3 groups. Believing that the first group had been deconflicted from the S76, she turned her attention to the other 2. She was concerned that both would conflict with 2 IFR departures requested by ADC. She commented that she delayed both departures initially, because she was not certain that the Tornados would remain N of 'The Line'. However, following co-ordination with Coltishall APP, seated to her L, the departures were released. She added that the Tornados drifted S of 'The Line', necessitating her to request that they be turned away from the departure track. Although no loss of separation occurred, her attention was focussed on this traffic and therefore did not notice the progress of the first group of Tornados and the fact that they routed S of 'The Line' and, unexpectedly, into the Norwich ATZ.

Norwich ADC confirmed that he understood, following co-ordination with the APR, that the S76's circuit was to be '**restricted**' ie to within 1.25nm of the RW and not above 1000ft QFE and he informed the pilot accordingly. The RTF transcript shows that, at 1422, in accordance with the local procedures, he informed the S76 pilot of the Tornados: *“...keep a good lookout in your circuiting N side there's a lot of diversions inbound to Coltishall on their RW04. They are joining visually but they probably don't know their procedures that well, so they may stray a little bit S”*. ADC said that he did not observe the ensuing confliction. He commented that the VCR faces S and his lookout was concentrated in that direction as he was dealing with traffic circuiting S of the airport.

THE TORNADO FORMATION LEADER'S UNIT comments that this unfortunate incident occurred after a long transit flight from Cyprus. The weather at Coningsby had deteriorated and so, following several approaches, the formation had diverted to Coltishall. Two of the formation pilots believed that there was a severe risk of collision whilst the third, the No 3, missed the break call

because the crew was changing to the manually dialled Tower frequency. It is probable, therefore, that it was this ac that passed closest to the helicopter.

HQ STC comments that there are several areas in this incident where performance was less than perfect, but ultimately this Airprox was the direct result of a breakdown in communication between the Norwich controllers who did not communicate clearly. This Airprox will be used as an example of poor teamwork in team resource management training (TRM). C-in-C STC commented recently on, "the importance of effective communication and good crew co-operation, and that ATC instructions need to be clear, concise and unambiguous." The need for clear and precise communication is just as great between controllers on the ground, as between controllers and aircrew in the air.

UKAB Note (2): Met Office archive data reveals that the Norwich 1420 METAR was: 03005KT 9000 FEW015 SCT050 SCT150 10/09 Q1004=, and the Coltishall 1350 METAR was: 03005KT 9999 FEW016 SCT100 BKN220 10/08 Q1004 BLU TEMPO SCT016 WHT=.

UKAB Note (3): The UK AIP at ENR 2-2-2-1 notifies the Coltishall ATZ as a radius of 2½nm centred on RW04/22, extending from the surface to 2000ft above the aerodrome elevation of 66ft amsl, active H24. The Norwich ATZ is a radius of 2½nm centred on RW09/27, extending from the surface to 2000ft above the aerodrome elevation of 117ft amsl.

UKAB Note (4): The LATCC (Mil) Cromer radar recording shows the Tornado F3 leader squawking A1745 indicating 021 Mode C, 3.7nm WNW of Norwich Airport tracking ESE and descending. The S76, shown only as a primary return, is 0.9nm NNW of Norwich tracking NE. At 1424:11, the Tornado formation turned L and levelled at 1424:21, with the leader displaying 013 Mode C - equating to 970ft Coltishall QFE (1002mb). Meanwhile the S76 has turned R downwind in the Tornado formations 12 o'clock. The formation rapidly closes and at 1424:36, the S76 is 1230 to the formation leader - 0.2nm ahead and tracking to the R at about 1.32nm N of the ARP. The next sweep, at 1424:41, reveals that

the leader has climbed indicating 016 Mode C (1013mb), but no return is apparent from the S76. It is probable that the reported encounter occurred at about this time, although neither the exact geometry nor separation can be determined with any accuracy. By interpolation, however, it would appear that the horizontal separation between the S76 and the Tornado formation leader was in the order of 0.08nm. It is probable that the horizontal separation between No3 and the S76 was less. The next sweep shows no return from the S76 nor Mode C from the Tornado F3 leader. At 1424:52, however, the Tornado formation break is evident when another primary return appears to the R of the Tornado formation leader, with a 3rd visible on the sweep timed at 1425:01, but after the event.

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 recognised that this was a complex scenario and a difficult situation significantly involving a number of ac recovering to an unfamiliar aerodrome after a long transit flight. Given the reported weather at the time – BLUE FEW 015 - [1-2/8ths at 1500ft] a VISUAL approach to RW04 would have seemed feasible at the nominated weather diversion, but the Coltishall APP controller was aware that preceding ac had obtained visual contact with the aerodrome only when they had descended to 1000ft QFE and below the Cct height of 1200ft QFE. Thus, expecting that the jets might have low fuel reserves that could have made a full pattern PAR impractical, APP had accepted the formation for a radar-visual recovery, fully aware that such a procedure was neither established nor promulgated for use on RW04. Some members were concerned about this issue, but the STC fast jet pilot member who was very familiar with Coltishall's operations briefed the Board that in practical terms the procedure was commonly in use. However, because of the proximity of Norwich airport and its associated ATZ this approach required careful handling by Coltishall ATC and accurate flying by homebased pilots

AIRPROX REPORT No 229/02.

alike. The Board thought visitors might not be so aware. Nonetheless, it was clear that APP, whilst vectoring the formation toward the centreline for RW04 had allowed them to fly south of 'The Line' which took the formation into the Norwich ATZ, something that was only permitted within the Norwich MATS Pt 2 for "instrument recoveries". In this confined airspace, controller members had some sympathy with the APP controller endeavouring to vector ac flying at 400kt; it required adept handling. Though entry into the Norwich ATZ had not been specifically agreed, nonetheless, APP had co-ordinated with Norwich APR - seated alongside - to facilitate this particular radar-visual recovery. The APR controller who was expecting the jets had, in turn, completed what she thought was appropriate co-ordination with her colleague in the Tower in case the jets had to revert to a PAR. But here was the crux of the issue; it was clear from the comprehensive ATSI report that incorrect phraseology was the root cause of this Airprox, insofar as the APR had not understood properly the meaning of the codeword and the implications of its use. In what emerged to be a thoroughly confusing and unclear exchange between the APR and ADC, the former had intended to make sure that the S76 would be flying within the aerodrome boundary and at a maximum of 500ft agl. Indeed this Airprox might not have occurred if she had used the correct codeword - "low-level". But her chosen words did not convey her meaning to the ADC, who quite understandably applied a "restricted" Cct, thereby allowing the S76 to fly out to 1¼nm from the aerodrome – though the helicopter was marginally outside this distance – and, significantly at the same level as that to which the Tornados had been descended. Some members considered that APP's vectors into the ATZ was a factor here and should be part of the cause. Other controller members opined that, though unexpected on her part, the APR believed she had taken sufficient action to ensure 500ft vertical separation, but she was mistaken. Opinion remained divided on the weighting given to this factor but at length a majority concluded that the Norwich APR did not correctly co-ordinate with the Norwich ADC, which led to the Tornado formation flying into conflict with the S76.

Turning to risk it was evident that, wisely, the ADC had passed a useful warning to the S76 crew

about the recovering jets. However, the helicopter crew was not well positioned to effect the outcome of this encounter. The pilots flying the ac could not see the jets approaching very rapidly from astern and though warned by the passenger (also a pilot) who spotted the developing conflict through the cabin window, those at the controls were unable to take effective avoiding action. Fortunately traffic information had been given to the formation about the presence of the S76, but unbeknown to either APP or the recipients this had given erroneous height information. It was fortunate that the lead and No2 F3 crews saw the helicopter when they did and called 'Break'. Unfortunately the No3 crew had missed this message when transmitted and must have been slightly bewildered when they suddenly saw the leader and the No2 breaking apparently without a warning on RT. That this Airprox occurred during the frequency change to TOWER was unlucky, but fortunately the No3 broke also, while unaware of the close proximity of the S76, which this crew did not see at all. As the radar recording did not clearly show all the ac separately within the formation it was not feasible to determine the minimum separation that pertained between the S76 and each F3. Against the lead ac it was in the order of 0.08nm [148m] but the leader had reported that the No3 flew about ¼nm from the helicopter. Whilst the No3 pilot's actions - rolling R and pulling up - had averted a collision with the S76, this was not deliberate avoiding action and some thought there must have been a risk of collision. However, without more factual information it was concluded that the safety of the ac involved had suffered significant compromise.

The Mil ATC Ops advisor added that a mutual review of procedures had been conducted by both ATSU's and appropriate revisions had been made to the respective units' standard and joint operating procedures.

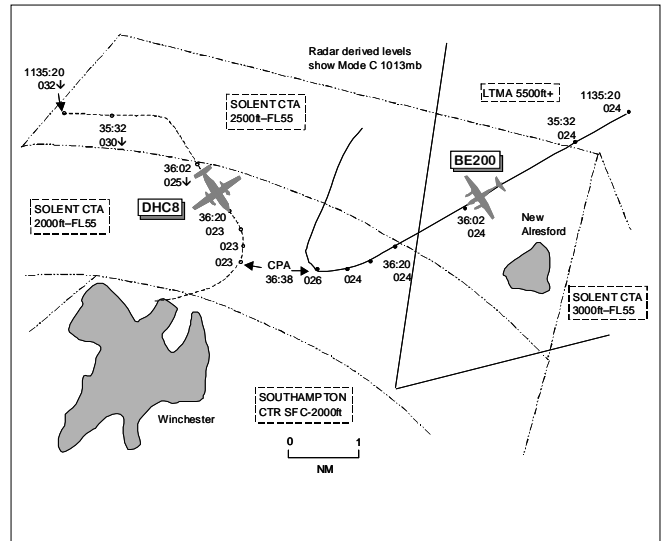
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Norwich APR did not correctly co-ordinate with the Norwich ADC, which led to the Tornado formation flying into conflict with the S76.

Degree of Risk: B.

AIRPROX REPORT NO 230/02Date/Time: 26 Nov 1137Position: 5105N 0116W (9nm NNE
Southampton - elev 44ft)Airspace: CTA (Class: D)Reporting Aircraft Reported AircraftType: DHC8 BE200Operator: CAT Civ TrgAlt/FL: 2300ft 2400ft
(QNH 1011mb) (QNH 1011mb)Weather IMC VMC CLACVisibility: 10km >10nmReported Separation:
100ft V 1.5nm H, NRRecorded Separation:

300ft V 1.1nm H

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

THE DHC8 PILOT reports that he was inbound to Southampton under a Radar Control Service in the CTA, flying at 160kt and on a heading of 160°. He had been cleared to establish on the localizer for RW20 but at about 9 DME, as he was descending through 2300ft for 2000ft, ATC gave an avoiding action R turn onto 270° and instructions to maintain current level. The ac was in 'clean' configuration at this stage, with the autopilot engaged. Whilst in the turn, the crew received a TCAS TA on other traffic, which was not seen, which TCAS indicated came within 1.5nm laterally and 100ft vertically. The TCAS TA was described as "useful" and the risk of collision as "high".

THE BE200 PILOT reports that he was engaged on a training flight inbound to Southampton from Norwich. His ac was coloured white with black and grey stripes and HISLs were on. He was squawking assigned code; TCAS was not fitted. The pilot did not see the other ac and could not report on separation or risk, but described his flight profile. He was initially in contact with Farnborough ATSU and reports receiving a RAS. As he was approaching Southampton airspace, he was about to query his clearance into the airspace when Farnborough passed a message to the effect that he was identified by Solent Radar and should contact them on 120.22MHz. This

frequency was initially busy, with what he believes were the avoiding action instructions to the DHC8. On initial contact he was told that he had entered Southampton airspace without a clearance and was issued an avoiding action R turn onto 090°.

ATSI reports that no Field Investigation was carried out in respect of this Airprox, as it initially appeared to have been an unauthorised infringement of CAS surrounding Southampton Airport. However, the following analysis has been compiled by reference to reports, radar and RT recordings.

The BE200 contacted Farnborough at 1126:30 and gave his position as 3.5nm E of OCK VOR. The pilot passed his details and requested a RIS. The Farnborough LARS controller instructed the pilot to squawk 0430 and identified the ac stating that it was now under a RIS. However, the controller did not pass the pilot his position, as is required in accordance with MATS Part 1.

At approximately 1133, the Farnborough LARS controller telephoned Southampton to pass the details on the BE200. The Southampton assistant, who clearly identified himself as "Solent Assistant", answered the call. The Farnborough controller then passed the details on the BE200 to the assistant. (*Note: radar handovers are only*

AIRPROX REPORT No 230/02.

permitted controller – controller, and not via an assistant). The Southampton assistant requested that Farnborough instruct the ac to remain outside controlled airspace and inform the crew that they (i.e. Southampton) could not promise an ILS approach, which had been requested as part of the training detail.

According to the Farnborough controller's report, she experienced difficulty in selecting the frequency* on her radar position and so asked the Farnborough Approach controller to pass the information on to the BE200. The exact content of this 'handover' is not known, as it was not conducted on a recorded line but face to face. The Farnborough Approach controller transmitted, at 1135:30, "*BE200 c/s er Southampton have you identified contact Solent Approach one two zero two two they can't guarantee an ILS*". No mention was made of the requirement to remain outside controlled airspace and it was incorrect to state that Southampton had the ac identified.

**(This was the first day of operation in the new Tower Building at Farnborough. After a period of working the controllers decided that it would be best to change around the working positions of LARS and Approach. This was achieved just after the details on the BE200 had been passed to Southampton).*

The radar recording shows that at that time, the BE200 was 12.5nm NE of Southampton Airport, at 2300ft and just about to enter the Solent CTA where the base is 2000ft.

Meanwhile, the Solent controller was vectoring the subject DHC8 for an ILS approach to RW20 at Southampton. Shortly after 1135, the controller instructed the DHC8 to turn R onto heading 160° and to report established on the localizer. The controller then passed TI to the DHC8 crew, advising that there was unknown traffic 5nm E, SW bound, with an unverified Mode C readout of 2400ft, just outside CAS. At 1136, the Solent controller passed avoiding action to the DHC8 to turn R immediately onto heading 270°.

The pilot of the BE200 established contact with Solent shortly after 1136, when the Southampton controller advised him that he had entered CAS without a clearance. The pilot was instructed to

turn L immediately onto an easterly heading, as avoiding action, and passed the position of the DHC8 as "*...west of you by two miles*". The pilot of the BE200 acknowledged this with "*turning c/s*" but then turned R instead of L as instructed.

[UKAB Note: During these avoiding action manoeuvres, the CPA occurred at 1136:38, as the DHC8, indicating FL023 (2230ft QNH 1011mb) was turning and passing 1.1nm W of the BE200, indicating FL026, 300ft below it.]

The pilot of the DHC8 reported having the traffic on TCAS and was positioned back onto the ILS. The BE200 was later issued with a VFR clearance to enter the zone.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Much debate took place surrounding the events immediately prior to the Airprox. The Farnborough LARS controller had passed the flight details on the BE200 to the Solent Assistant who had requested that the Beech pilot be told to remain outside CAS. The LARS controller then had difficulty selecting the correct frequency so the Farnborough Approach controller was requested to pass on the message to the Beech pilot. Although the BE200 pilot was told, erroneously, that he was identified to Southampton and to contact them on their frequency, he had mistakenly believed that this 'radar handover' could be taken as clearance to enter the Solent CTA. Although no mention had been made to him, by Farnborough, to remain outside CAS, the onus nevertheless remained on the BE200 pilot to obtain positive clearance to enter the CTA before doing so - a salutary lesson to all aviators. With only a short time between leaving the Farnborough frequency and reaching the CAS boundary, the BE200 pilot was then baulked from making his initial call, owing to other RT transmissions. During this period the BE200 pilot entered the CTA and flew into conflict with the DHC8. Eventually, after calling on the RT and being admonished by the Solent controller for

entering the CTA without clearance, he was given an avoiding action L turn onto E. However, for whatever reason, the Beech pilot turned R, which unfortunately compounded the incident by turning his ac, towards, not away from, the DHC8.

Looking at risk, the Solent controller had forewarned the DHC8 crew of the approaching BE200 and then issued an avoiding action R turn onto W as the Beech approached the FAT of RW20 from the NE. The DHC8 crew, flying IMC, reacted to the ATC instruction and watched the BE200 on TCAS pass 100ft above and 1.5nm behind their ac. The BE200 was given a L turn away from the DHC8, immediately after calling on RT, but unfortunately the pilot turned R. This turn exacerbated the situation with the pilot never visually acquiring the conflicting DHC8, as he turned belly-up to it. The recorded radar shows the BE200 climbing 200ft during their tight turn,

passing 1.1nm E of and 300ft above the DHC8, unsighted. Although the avoiding action given by the Solent controller should have resolved the conflict, members agreed that the unfortunate direction of turn made by the Beech pilot had turned what would have been a 'no risk of collision' situation into one where safety had not been assured during the encounter.

PART C: ASSESSMENT OF CAUSE AND RISK

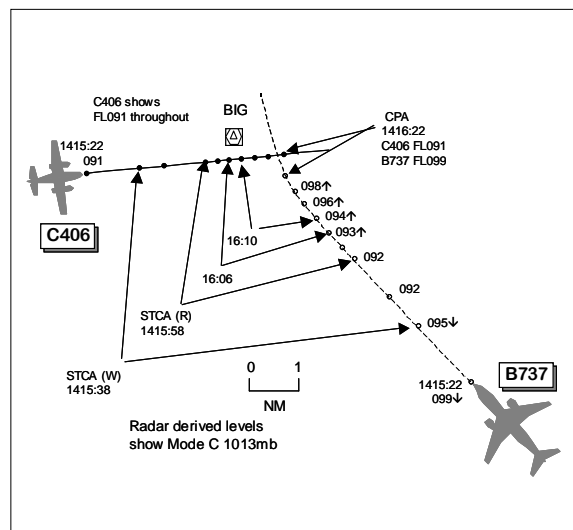
Cause: The BE200 pilot entered the Solent CTA (Class D) without clearance and flew into conflict with the DHC8, which he did not see, compounded by the BE200 pilot turning R instead of L as instructed.

Degree of Risk: B

AIRPROX REPORT NO 232/02

Date/Time: 5 Dec 1416
Position: 5119N 0003E (1nm SE BIG)
Airspace: TMA (Class: A)
Reporting Aircraft Reported Aircraft
Type: B737-500 C406
Operator: CAT Civ Comm
Alt/FL: ↓FL70 FL90

Weather VMC CLOC VMC CLAC
Visibility: 10km >10km
Reported Separation:
 400ft V nil H not seen
Recorded Separation:
 800ft V 0.5nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE B737 PILOT reports heading approx 340° en route to BIG at 220kt and descending to FL70 in accordance with his clearance from London. Approaching FL90 and as the Capt (PNF) was giving a PA call to the cabin crew, a TCAS TA warning was received on climbing traffic, he thought, just L of the ac's nose, about 5nm away. The FO (PF) visually acquired the other ac

simultaneously with TCAS annunciating "climb". The PF disconnected the A/P and auto-thrust and, whilst following the TCAS guidance, ATC gave "avoiding action turn right heading 070° and descend to FL70". The RA then 'softened' the climb rate, quickly followed by "clear of conflict"; ATC then gave a heading of 290° and descent to FL70. The conflicting traffic was seen as a blue/

AIRPROX REPORT No 232/02.

white twin engined propeller driven ac which passed 400ft under the ac's nose and he assessed the risk of collision as medium.

THE C406 PILOT reports heading 095° at 220kt cruising at FL90 en route to Germany and in receipt of an ATS from London. In the vicinity of BIG, he heard ATC tell another ac to "*expedite descent*" but this was followed shortly by the subject ac reporting "*TCAS climb*". Less than 45sec after the TCAS transmission, he experienced moderate to severe turbulence, on an otherwise calm day, which he assumed to be 'wake turbulence'. Although he was flying 3000ft above cloud in VMC with >10km visibility, the other ac was not seen visually either prior to or post incident; he assessed the risk as high.

ATSI reports that the controller was operating the TC SE Sectors BIGGIN/TIMBA in bandboxed mode. He described the traffic loading as medium although the presence of the overflight (the C406) through the TMA at FL90, did add to the complexity of the task.

The B737 established communication with the BIGGIN/TIMBA Sector at 1407, reporting maintaining FL240 but with clearance to descend, when ready, to FL150 to be level at TIGER. This was in accordance with the Standing Agreement between LACC Sector 17 and TC BIGGIN. The ac was instructed to route direct to BIG VOR, to expect no delay.

At 1411, the B737 was cleared to descend to FL110. The SC could not recollect why he used this level but it could have been against a Gatwick departure via Clacton, which, the RT recording reveals, he had just instructed to climb to FL100. In any case, it ensured that the flight was given a continuous descent profile. Approximately ninety seconds later, the B737 was instructed to descend to FL70, to be FL80 or below, by BIG. Although this transmission was blocked, initially, it was repeated and the pilot read back the clearance correctly. The SC explained that the level restriction at BIG was intended to provide separation from the C406, at FL90, routing eastbound through BIG towards the Dover (DVR) VOR. The radar shows the B737 passing FL147, 21.3nm from BIG, with the C406 30.4nm to its NW.

The SC said that he could not remember if the C406's fps was in the display when he took over the position about twenty minutes previously. However, he recollected that the co-ordinator had informed him about the overflight at FL90. He commented that, as the SC, he had the option to request that the flight be routed clear of the TMA but, in view of his relatively low workload, he could foresee no insurmountable problem to it routing through BIG. The C406 made its initial call on the frequency, at 1413, and was instructed to continue on its reported heading of 095°. Shortly afterwards, it was instructed to turn L heading 085°, to ensure that it would route close to the BIG VOR. (NB Subsequently, it passed approximately 0.5nm S of BIG). By this time, the radar shows that the B737 was passing FL123, 12.2nm from BIG VOR and 17.5nm SE of the C406. The SC commented that, as far as he was concerned, his plan to separate the subject ac would resolve the potential confliction and he turned his attention to traffic elsewhere in the sector.

The SC said that he only became aware of the developing situation between the subject ac when STCA activated, with a low severity alert, at 1415:38. At the time, the B737 was passing FL95 on a conflicting track with the C406, which was 6nm away. His first reaction was to instruct the B737 to "*expedite the descent*". Receiving no acknowledgement, he repeated the call, again without response. The SC thought that, if the pilot had reacted straight away to his first call to expedite descent, the situation could have been resolved without a loss of separation. However, at the same time as the STCA turned to a high severity alert (1415:58), the SC transmitted to the B737 "*...avoiding action turn left immediately now heading zero seven five degrees*". [UKAB Note (1): The radar recording shows the subject ac 3.45nm apart, the B737 at FL92 and 100ft above the C406]. The pilot replied "*TCAS climb*". The SC confirmed that he had intended to pass the heading as 275° but inexplicably transmitted 075°. (The pilot wrote in his report that ATC had issued a R turn heading 075°.) The SC stated that, as the pilot had reported reacting to a TCAS RA, he considered that the situation was being resolved and there was no need to pass TI to either flight and/or 'avoiding action' to the C406. The MATS Part 1, Section 1, Chapter 3, Page 2,

states that when a controller is faced with a situation when two ac are separated by less than

the prescribed minima he is to “*When considered practicable, pass traffic information if a radar service is being provided*”. Additionally, the MATS Part 1, Supplementary Instruction 3/2001, states the procedures to be followed by controllers after a pilot has reported reacting to a TCAS RA. These include: “*On being informed that an ac is manoeuvring in accordance with a TCAS Resolution Advisory (RA), a controller must not issue control instructions to that ac which are contrary to the RA communicated by the flight crew. Once an ac departs from an ATC clearance, in response to an RA, the controller ceases to be responsible for providing standard separation between that ac and other ac affected as a direct consequence of that RA manoeuvre. However, controllers should continue to provide traffic advice to ac affected by the manoeuvre*”. The pilot of the C406, whose ac was not equipped with TCAS, reported that he had not seen the other ac but had experienced, what he believed, was wake turbulence caused by its close proximity. The receipt of TI may have assisted the pilot’s awareness of the situation. The SC said that he was aware of the ‘new’ avoiding action phraseology but had reverted to the one he was more used to and which he had been trained to use at the College of ATC. The radar recording reveals that the B737 did not descend below FL92. By the time it was passing FL93 in the climb (1416:06), after reacting to a TCAS RA, the subject ac were 2.3nm apart. 4 sec later when the B737 was climbing through FL94, the separation distance had reduced to 1.8nm. [UKAB Note (2): The CPA occurs at 1416:22 with the B737 indicating FL099 with the C406 in its 1 o’clock range 0.5nm, 800ft below. The next radar sweep shows the B737 passing directly behind the C406 by just over 0.5 nm, still indicating 800 ft above]. Throughout the encounter, the C406 is shown to be maintaining FL91. There is no reason to believe that the B737 would not have complied with its clearance, to be at FL80 or below by BIG, if it had not received a TCAS RA. It averaged a descent rate of over 2000fpm minute until it was passing FL95, by which time it was 5nm from BIG and the rate started to decrease. It then levelled off at FL92, before climbing in response to a TCAS RA. If the average rate of descent had been

maintained, it is assessed that the level restriction would have been accomplished. Consequently,

even with the pilot of the B737 complying with the level restriction at BIG, there was no guarantee that the SC’s plan would ensure that separation would be maintained. Alternative plans to resolve the confliction might have been to vector the B737 behind the C406 or instruct the B737 to be at FL80 or below, 10nm from BIG.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members agreed with the ATSI report that the technique employed by the SC had not been ‘fail safe’. Although the B737 would have complied with the ATC imposed ‘level restriction’ at BIG, the descent clearance issued by the TC BIGGIN/TIMBA SC did not ensure that the subject ac would be adequately separated when their acs’ projected tracks crossed. This had caused the Airprox.

TCAS had alerted the B737 crew to the confliction which enabled the PF to acquire the C406 visually, about 5nm ahead, as an RA “*climb*” command was received. The crew reacted quickly and followed the guidance as ATC gave avoiding action instructions – they had informed ATC of their TCAS manoeuvring. Although STCA had alerted the SC, his first two RT calls to the B737 crew to “*expedite the descent*”, to resolve the confliction, went unanswered presumably as the B737 PF was busy assimilating TCAS information and following the equipment’s advice to climb. The SC’s intended avoiding action L turn onto 275° was unfortunately passed as L onto 075° but interpreted as a R turn by the B737 crew; by then it was too late to have any degree of effectiveness. The C406 pilot had heard the B737 “*TCAS climb*” transmission but, without the benefit of TCAS or TI, he had not seen the conflicting B737 at all. Members noted the Cessna pilot’s comment about ‘wake turbulence’ but this

AIRPROX REPORT No 233/02.

was not borne out from the radar recording as emanating from the subject B737, which had passed above and behind the C406. Although untidy, the visual acquisition of the C406 and prompt actions by the B737 crew to climb in response to the TCAS RA led the Board to agree that any risk of collision had been effectively removed.

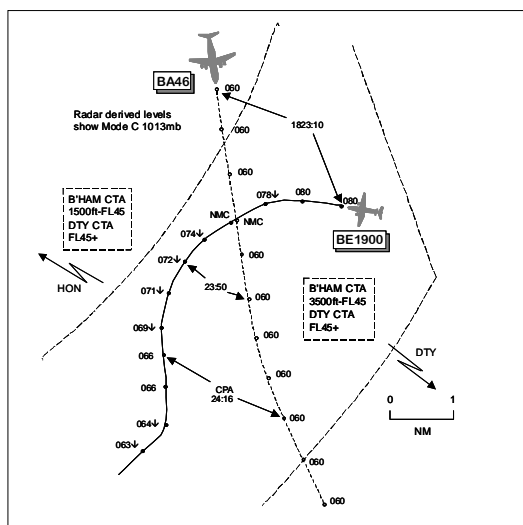
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The TC BIGGIN/TIMBA SC descended the B737 into conflict with the C406.

Degree of Risk: C

AIRPROX REPORT NO 233/02

Date/Time: 6 Dec 1824 NIGHT
Position: 5216N 0127W (10nm SE HON VOR)
Airspace: CTA (Class: A)
Reporter: LTCC MIDLANDS/COWLY SC
First Aircraft Second Aircraft
Type: BA46 BE1900
Operator: CAT CAT
Alt/FL: FL60 NR
Weather: VMC IMC
Visibility: >10km
Reported Separation:
nil V 3nm H NR
Recorded Separation:
600ft V 2.1nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE LTCC MIDLANDS/COWLY SECTOR CONTROLLER reports that he was acting as Instructor with a trainee controller operating the position. They had been working the BA46 for about 10nm, following its departure from RW33 at Birmingham. In accordance with procedures, the ac was maintaining FL60 owing to conflicting traffic above (the subject BE1900) inbound to Birmingham. Both he and the trainee noticed that the BE1900 had started to descend before the standard separation of 5nm had been established. The trainee gave avoiding action and TI to the BA46 but as the BE1900 was already in the 6 o'clock of the BA46, separation was quickly regained.

THE BIRMINGHAM APPROACH NO 2 DIRECTOR reports the BE1900 was transferred to him for vectoring to an ILS on RW33 in a

descent to FL80 heading towards HON. Owing to faster following traffic he descended the BE1900 to FL70 and then the crew reported reducing speed to 180kt. For positioning into the traffic sequence, he then gave it a L turn onto heading 170° and further descent to FL50. He was then made aware of an outbound BA46, which was 2nm S of the BE1900, tracking S level at FL60 which was working London. Owing to label clutter, he could not determine the BE1900's level so he gave the crew a R turn onto heading 240° to increase separation.

THE BA46 PILOT reports heading 155° at 250kt following a COWLY 2D SID from Birmingham and he had levelled at FL60 whilst awaiting further climb clearance from London on frequency 133.07MHz.. Another ac was observed on TCAS, approaching from the E and descending. The ac

was acquired visually and was seen to pass directly overhead. It continued descent, passing through the same level at about 3nm range. There were no TCAS warnings, but the London controller gave an avoiding action L turn onto 110°. The A/P was disconnected for the turn, after which the flight continued normally. The pilot reported *"no risk of collision existed"*.

THE BE1900 PILOT reports that he was in the latter stages of an en route descent at 180kt inbound to Birmingham. His ac was displaying navigation lights, strobes and recognition lights, and was squawking an assigned code with Mode C; TCAS 1 was fitted. The pilot was not able to supply any further information concerning the incident.

ATSI reports that at the time of the Airprox, the BE1900 was in communication with the Birmingham Approach No. 2 Director whilst the BA46 had been transferred to the TC Midlands SC. The Birmingham No 2 Director reported his workload as light, likewise the traffic loading.

The BA46 departed from RW33 at Birmingham following a COWLY 2D SID and established contact with Birmingham Approach at 1818. In accordance with the SID, the BA46 was climbing to FL60 and, at 1818:50, was transferred to the TC Midlands frequency.

At 1820:10, the BE1900 established communications with the Birmingham APR and reported descending to FL80 inbound to HON. This position was being manned by a mentor and trainee. The crew were advised that they were number three in traffic and they could expect vectors to the ILS for RW33. Shortly afterwards, the crew were instructed to leave HON heading 240° and, at 1822:20, to change frequency to the Birmingham Approach Director. At that time, the BE1900 was 18nm SE of Birmingham Airport, passing FL88 with the BA46 in its 2 o'clock position range 9nm level at FL60.

On initial contact with Director, the BE1900 was given clearance to descend to FL70. This was acknowledged and the crew requested to reduce speed to 180kt, which the Director approved together with issuing an instruction to turn L heading 170°. At 1823:10, the Director instructed the BE1900 to descend to FL60. This was acknowledged but he asked for confirmation of

the radar heading of 170°. The Director explained to the crew that he was *"...just winding you out you're number three at the moment."* At that time, the BE1900 was still tracking towards HON with the BA46 in its 2 o'clock position at 2.6nm. Whilst these exchanges were taking place, the TC Midlands SC instructed the BA46 to fly a heading of 175°, which amounted to a R turn of some 10°.

At 1823:50, the Director issued descent clearance to the BE1900 to FL50. The tracks of the BE1900 and the BA46 had crossed with the BE1900 passing FL72 in a L turn onto 170°, now in the 4 o'clock position of the BA46, which was still maintaining FL60. The TC Midlands SC noticed that the Mode C of the BE1900 was continuing to reduce and so he instructed the BA46 to turn onto 155°. At 1824:00, the Director saw the confliction and transmitted *"BE1900 c/s, cancel last and hold turn right heading two four zero"*. Separation reduced to a minimum at 1824:16, when the BE1900 was in the 5 o'clock position of the BA46 at a range of 2.1nm and 600ft above it. It was at that time that the Director instructed the BE1900 to *"....turn all the way round to heading three six zero"*. The TC Midlands SC also passed avoiding action to the BA46 to turn L heading 130°. The result of these turns was to restore lateral separation quickly whilst the BE1900 continued its descent through the level of the BA46.

Birmingham operates a system that utilises a No. 1 Radar controller and a No. 2 Radar controller, each with specified responsibilities. The unit's MATS Part 2 lists these duties and the first of those for the No. 2 Radar controller, states that he will control inbound ac transferred by the No. 1 Radar controller and the vectoring of such traffic to a suitable position for an ILS or visual approach. There are also details of the delegated area of autonomous operation for Radar 2. The following extracts are taken from the LTCC MATS Part 2 under the TC Midlands section in respect of procedures associated with Birmingham: *'Aircraft are to be descended to FL80 on their own navigation to HON'. 'The Transfer of Control Point is defined as the line through DTY delineating the change of base level of controlled airspace. Birmingham APC may descend any ac transferred to them by TC Midlands following Silent handover procedures to FL70, provided that they have passed the Transfer of Control Point. If Birmingham APC descend ac below FL70 before they are west of the Runway 33*

AIRPROX REPORT No 233/02.

extended centre-line, Birmingham APC must ensure separation with departing traffic from Birmingham and Coventry that is either following the SID or Standard Departure Route Track'.

The Birmingham MATS Part 2 states that when RW33 is in use the following shall apply 'Aircraft can not be descended by Rad 2 on handover from Rad 1 below FL70 unless prior co-ordination has taken place or the ac has entered R2's delineated airspace. Any restrictions to the vectoring of ac by Rad 2 shall be co-ordinated prior to transfer. To indicate that Rad 2 may descend the ac without further co-ordination, Rad 1 will annotate the FPS as shown in the diagram(a co-ordinated descent arrow)'.

The Director explained that his initial plan was to descend the BE1900 to FL70 and position it straight in behind the preceding ac. He stated that the ac had been transferred from TC to Radar 1 and then to him in accordance with standard procedures. He was unaware of the outbound the BA46 and he commented that, in his view, it was common practice for the Radar 1 controller to point out such traffic to the Director but this had not happened on this occasion. No fpps on outbound flights are provided for the Director, and the Radar 1 controller usually removes such strips once the ac have been transferred to the TC frequency. The strip on the BE1900 was passed from Radar 1 to the Director but, on this occasion, there was no co-ordinated descent arrow on it.

The Director wanted to descend the BE1900 further so that he could position behind the ac ahead. He admitted that he was concentrating on this aspect of his plan and did not check the radar carefully before issuing descent below FL70. Furthermore, he had not noticed the outbound BA46 and so it did not cross his mind to co-ordinate with TC. He recalled that the labels on the two ac were overlapping and it was the Radar 1 mentor who, having seen the Mode C of the BE1900 descending below FL70 prompted him that there was traffic below and just to the E.

The Director reported that he didn't use the words "avoiding action" due to the clutter of the labels. Additionally, he did not consider a vertical resolution of the problem just a lateral one. He

also added that he didn't ask the BE1900 its level, as he was working in a radar environment. Had he done so, when he first saw the confliction, then it is probable that vertical separation would have been maintained, as the Mode C readout from the BE1900 indicates that he was descending slowly and just passing FL71.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members agreed and were critical that the Birmingham No2 Director appeared to working in isolation instead of being part of a team. There were robust procedures in place which he did not follow that led to a loss of separation between the subject ac. The fps on the BE1900 had been correctly annotated prior to the ac being transferred to him from his No1 Director colleague. Even so, he issued the BE1900 with descent clearance below FL70 without co-ordinating with TC, prior to crossing through the RW33 extended C/L and without noticing the BA46 on radar. Attention to any one of these safety nets would have produced a different outcome.

Fortunately, the No1 Director seated alongside the No2 pointed out the potential confliction as standard separation was being lost. Simultaneously, the TC Midlands SC also saw the situation and gave an avoiding action L turn to the BA46. The No2 Director issued a R turn to the BE1900 by which time it had already crossed O/H and was flying behind the BA46 at a slower speed on a slowly diverging track. The BA46 had 'seen' the Beech first on TCAS and then visually as it passed O/H before descending through their level about 3nm away to their R. The Board were clear that the geometry of the encounter combined with the actions taken by the No2 Director and TC controllers had effectively rendered the situation benign to the extent that there had been no risk of collision during the encounter.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Birmingham No2 Director did not follow procedures which led to a loss of standard separation.

Degree of Risk: C

AIRPROX REPORT NO 234/02

Date/Time: 8 Dec 1424 (Sunday)

Position: 5554N 0423W (2nm NE Glasgow - elev 26ft)

Airspace: ATZ/CTR (Class: D)

Reporting Aircraft Reported Aircraft

Type: ATP PA38

Operator: CAT Civ Trg

Alt/FL: 600ft↑ 1000ft↑
(QNH 1030mb) (QFE)

Weather VMC CLBC VMC CLBC

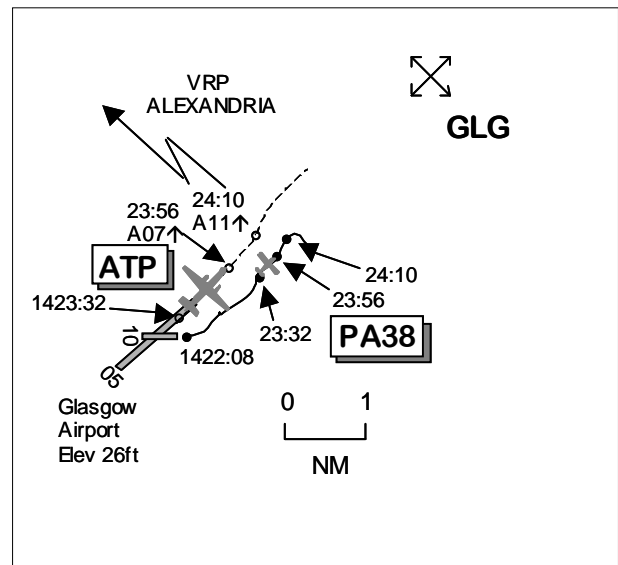
Visibility: 7km >10km

Reported Separation:

300ft V 300m H nil V 0.5nm H

Recorded Separation:

0.33nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE ATP PILOT reports heading 053° at 140kt on climbout from RW05 at Glasgow cleared to 6000ft and in receipt of ATS from Glasgow on 118.8MHz. Climbing through 600ft QNH, he saw an ac directly ahead and above which had previously taken off from RW10 and which had been instructed to parallel the RW05 climbout. The FO, PF, initiated a 10° turn to the L to increase separation. He, the PNF, alerted ATC to the light ac's position, estimating it was 400ft above and decreasing, displaced 100m to the R of his projected track, 300m ahead. ATC told the light ac to position further to the E and it was seen to execute a R turn, eventually passing 300m to his R and 300ft above; the SID was then re-established. During the encounter no TCAS alerts had been received and he assessed the risk of collision as high.

THE PA38 PILOT reports flying a local dual training sortie from Glasgow squawking 7000, he thought, with NMC and receiving an ATS from Glasgow TOWER on 118.8MHz. The visibility was >10km 2000ft below cloud in VMC and his ac was coloured white with wing-tip strobe lights switched on. After take-off from RW10 and whilst climbing at 70kt, he complied with an ATC instruction to fly parallel to the RW05 climbout by heading 075° to compensate for the crosswind; he tracked to the E of the climbout while observing an ac, the subject ATP, taking off from that RW. Climbing through 1000ft QFE, he heard the ATP pilot complain that his ac was only 250yd away, about 15sec before the ATP had climbed through his level. He estimated it to be 0.5nm away. The ATP was seen to pass to his L still about 0.5nm away and he believed that there had been no risk of collision.

AIRPROX REPORT No 234/02.

ATSI reports that at the time of the Airprox, both ac were in communication with the Glasgow Air Controller. Both the workload and traffic loading were described as light.

The PA38 established communications with the Glasgow Air Controller, having been transferred from Ground Movement Control, at 1410:30. The pilot reported at Holding Position W1 and ready for departure for a local VFR flight. The Air controller acknowledged this transmission and shortly afterwards, instructed the PA38 to line up on RW10 after another ac had landed. At 1418:15, the ATP reported on the frequency and advised that they were taxiing to Holding Position G1.

At 1419:20, the ATP was instructed to line up and wait on RW05 and told *"....there will be a light ac departing ahead of you off runway one zero"*. A vehicle had been clearing birds from the main RW (05/23) and this had caused a short delay to both ac. Once this operation had been completed, the Air controller cleared the PA38 for take off on RW10 and passed a surface wind check of 090° at 16kt. The ac was routeing to the Local Flying Area, located near Loch Lomond, which would involve a L turn after departure, thereafter following the N bank of the River Clyde to leave the control zone at Alexandria. The controller advised that the PA38 was cleared to cross the RW05 climbout, which the pilot acknowledged.

Shortly afterwards, the Air controller received a release from Approach Control in respect of the ATP's departure. By then, the PA38 was airborne and, at 1422:25, the Air controller transmitted *"And PA38 c/s in fact change of plan to turn just er parallel the zero five climbout"*. The pilot requested that the controller repeat the message, which was done and acknowledged. The controller then transmitted *"And PA38 c/s after the departing ATP you're clear to cross behind that traffic and er cross the zero five climbout"*. Again, this was correctly acknowledged.

At 1422:55, the controller cleared the ATP for take off on RW05. A surface wind check was passed but no TI issued. Just over one minute later, the pilot of the ATP commented *"....that light ac was actually overhead the climbout path"*. The controller acknowledged this and instructed the PA38 to move to the E. Although the pilot of the ATP then advised that the PA38 had only been

".....a few hundred yards with about two hundred feet", no mention was made of filing an Airprox. However, subsequently the crew filed a report with their company.

The Air controller reported that she had started duty at 1400 and self briefed using the briefing boards and folders available. She commented that she was not aware of a Strong Wind warning, but one was included with the Airmet Area Forecast for the Scottish Region. To the best of her recollection, the controller she took over from made no mention of the wind. As the instruction issued to the PA38 was to track parallel to the climbout of RW05, the wind at 1000ft and associated drift might have been a significant factor.

When the Air controller had passed the airborne time on the PA38 to Approach Control, a departure release had been issued in respect of the ATP. This made the Air controller change her plan and, in order to facilitate the departure of the ATP, the PA38 was instructed to fly parallel to the climbout of RW05. This is a commonly used technique at the unit when both RWs10 and 05 are being used. The controller recalled that the PA38 was airborne and was passing the intersection of RWs 05 and 10 when the instruction was given. The Airmet Area Forecast detailed the wind at 1000ft as 110/25kt. In his report, the pilot of the PA38 stated that he took up a heading of 075° to compensate for the drift and maintain a track parallel to the RW05 climbout. It appears that, when using this technique, there is no minimum lateral distance from the climbout specified. Whilst it is straightforward enough to fly parallel with the RW itself, maintaining a track parallel to the climbout path, by reference to ground features would be somewhat difficult and probably imprecise.

MATS Part 1, Section 1 Chapter 2 Page 1, states that minimum services are to be provided by an ATC Unit according to the Class of airspace. Within Class D airspace, one requirement is: *'pass traffic information to IFR flights on VFR flights and give traffic avoidance if requested'*. The Air controller had informed the crew of the ATP that a light ac would depart off runway 10 prior to their departure but no specific TI on the intentions or route of the PA38 were passed. The Air controller reported that, with hindsight, the passing of TI to the ATP crew prior to clearing it for

take off would have probably resolved the situation. However, she had monitored both ac visually and remained satisfied that adequate 'separation' existed between them. The pilot of the PA38 shared this view. Use had not been made of the Air Traffic Monitor, as the visibility from the Tower was clear and unobstructed.

UKAB Note (1): The Glasgow METAR shows EGPF 1420Z 08014KT 9999 BKN030 06/02 Q1030=

UKAB Note (2): Analysis of the Glasgow recorded radar shows a primary only return, the PA38, just airborne from RW10 at 1422:08 tracking E before commencing a L turn about 15sec later; the PA38 steadies on a NE track. The ATP is seen at 1423:32 as a primary only return airborne RW05 tracking 050° with the PA38 in its 1230 position range 1.1nm; the ATP's assigned squawk appears at 1423:56 indicating 700ft QNH 1030mb by which time the PA38 is in its 1 o'clock range 0.6nm tracking 035°. The CPA occurs at 1424:10, the ATP is indicating 1100ft QNH passing 0.33nm W of the PA38. Immediately thereafter, the PA38 is seen to execute a R turn as the ATP is seen to turn L.

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 Air Controller had changed her plan to afford the IFR ATP priority over the VFR PA38 which had become airborne first. The PA38 pilot had complied with the Air Controller's instruction and paralleled the RW05 climbout whilst maintaining visual separation from the ATP; no separation minima are specified between the two categories of flight within Class D airspace. Once airborne, the ATP crew were 'shocked' to see the PA38 apparently almost directly ahead. Members believed that the difference between the ac's

heading and its track made good (drift angle), owing to the strong crosswind, would have exacerbated the visual effect. From all of this it was concluded that the cause of this Airprox had been the flight path flown by the PA38 pilot, as specified by the Glasgow Air Controller, had caused concern to the ATP crew. Undoubtedly, had TI been passed to the ATP crew, prior to departure, on the PA38's position, track and intentions, it would probably have alerted its crew to acquire the light ac visually and allow them to assess in good time whether the other ac was adequately separated from their intended climbout path. It was agreed that the lack of TI had been a contributory factor in this Airprox.

Looking at the risk element, neither the Air Controller nor the PA38 pilot had shared the concerns of the ATP crew. The controller had visually monitored the situation, as is catered for within the regulations, and had judged the separation distance as adequate. Similarly, the PA38 pilot had watched the ATP depart and then fly clear to his L by about 0.5nm climbing through his level. However, the ATP crew had seen the PA38 late (300m away and 400ft above, they thought), and had executed a 10° L turn to increase separation, eventually passing a reported 300m clear and 300ft above. The radar recording had shown the 10° turn away had achieved a CPA of 0.33nm (617m). This separation and the point that the PA38 pilot had always been in a position to manoeuvre his ac further, if necessary, led the Board to conclude that there had been no risk of collision.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The flight path flown by the PA38 pilot, as specified by the Glasgow Air Controller, caused concern to the ATP crew.

Degree of Risk: C

Contributory Factor: Lack of TI from the Glasgow Air Controller to the ATP crew on the PA38.

AIRPROX REPORT No 235/02.

AIRPROX REPORT NO 235/02

Date/Time: 9 Dec 0936

Position: 5702N 00424W (12nm SW GUSSI)

Airspace: ADR W3D/ (Class: F/G)
Scottish FIR

Reporter: ScACC Tay Sector Tactical
Controller

First Aircraft Second Aircraft

Type: BE20 Tornado F3 x3

Operator: Civ Comm HQ STC

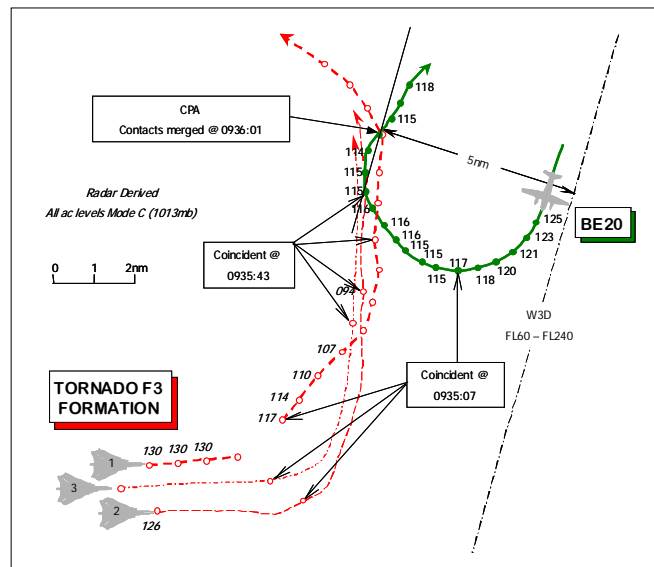
Alt/FL: FL110 10500ft
(RPS NK)

Weather VMC CAVOK VMC NK

Visibility: 30km 30km

Reported Separation:
1000ft V, Nil H 1000ft V, 1-5nmH

Recorded Separation:
Contacts merged in azimuth



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE ScACC TAY SECTOR TACTICAL CONTROLLER reports that he was initially working Tay Sector as S&T [Support & Tactical] and had given Lossiemouth FL210 for the southbound BE20. The WEST COAST SC advised him of a military formation from the W, which might conflict with his traffic, and he wound out his displayed range to assess the problem. On initial contact the BE20 was passing FL160 for FL210 but requested descent to FL100. He was given FL110 and commenced descent. At about this time the formation was 35nm SW of the BE20, either 3 or 4 targets indicating around FL130 unverified. He gave the BE20 pilot this initial traffic information. On projected tracks he estimated that the formation would pass ahead although close to his traffic. Further traffic information was given when the formation was about 15nm away and he established that the BE20 pilot was VMC. Having judged that the formation was going to continue on an easterly track and was not going to take avoiding action on his ADR traffic, he instructed the BE20 pilot to make a RH orbit. He did not use the phrase "avoiding action" as it did not occur to him as appropriate at the time. The plan was going to work with the BE20 in the R turn at 11nm range and diverging from the formation. With about 7nm

H separation and increasing, the formation turned hard L to intercept the BE20. He continued to give the BE20 pilot traffic information but could do nothing more to assist. The formation passed beneath and the BE20 pilot acquired them visually.

THE BE20 PILOT reports that he was en route from Inverness to Shoreham on ADR W3D in good VMC at 220kt and in receipt of a RAS from SCOTTISH CONTROL. His ac was white with red and blue stripes; navigation lights and HISLs were selected on, but TCAS is not fitted. Descending from FL140 to FL110 on W3D between GUSSI and RANOK, he was advised by ATC of a group of 3 high-speed ac, at or below FL130, 20nm to the SW on a converging hdg. The traffic information was updated when the other ac were range 15nm, still at FL130 or below, by which time the BE20 was passing FL120 in descent. ATC then requested a RH orbit for separation (under RAS). Shortly after, the other ac were reported as all around and no further instruction could be given. Although the visibility was very good and there was no undue workload on the flight crew, the other ac were not seen, because the view was slightly obscured by the wing during the RH orbit, until the FO saw one Tornado pass 1000ft

beneath, flying straight and level at high speed. Risk of collision, he assessed, was low/moderate.

THE TORNADO F3 FORMATION NO 2 PILOT reports, on behalf of the Formation Leader, that the flight of 3 ac was operating autonomously under VFR, at 400kt in good VMC and squawking 1322 (designated sqn SSR Mode 3/A code). All ac were camouflaged grey but HISLs were selected off. A contact was acquired on radar at 20nm, though the contact gave erratic speed indications due to its RH orbit, and was subsequently visually acquired at 8nm. law HQ STC TI 4/84, Target of Opportunity (TOO) Rules, the formation performed a 3-ship Phase 1 visual identification (VID) profile where the lead ac performed a VID followed by the Nos 2 and 3 in 3nm trail. As soon as the Formation Leader realised that the target was a civil ac he turned away at 1.5nm. Nos 2 and 3 did not get within 2nm of the target. There was no close proximity to the other ac and no risk of collision.

UKAB Note (1): UK AIP ENR 1-6-2-3, UK SSR Code Assignment Plan, promulgates that SSR Mode 3/A code 1322 is assigned to “NATO – Special Events (activated by NOTAM)” However, the UK NOTAM Office is unable to substantiate that a NOTAM was applicable for the area of the reported incident. Moreover, DAP Manager Surveillance and Spectrum Management has no record of authorization for the use of SSR Mode 3/A code 1322 on 9th December.

ScACC ATCI reports that the BE20 was outbound from Inverness to Shoreham, climbing to FL210 southbound on ADR W3D, and in receipt of a RAS from ScACC Tay Sector Tactical (TAC) Controller. However, because of headwinds the BE20 pilot asked for a lower cruise level and was assigned FL110. While the ac was in descent, TAC was warned by a colleague on the West Coast sector of a military formation at FL130 heading E towards the ADR. At 0933:06 TAC asked the BE20 pilot for his flight conditions and when advised that these were VMC gave the BE20 pilot traffic information on “... 3 fast moving targets from the W, 25nm SW of you, indicating around about FL130 unverified”.

At 0933:53, when the BE20 was passing FL138 in the descent, the TAC suggested a RH orbit to increase separation from the military formation. Further traffic information was passed at 0934:08

“That traffic now in your 2 o'clock position range 10 miles – there's at least 3 of them, indicating FL130”. A traffic update was passed at 0934:05 when the military targets were 10nm SW of the BE20. STCA activated at 0934:53 when the nearest target was 8.2nm distant. At this point the 3 military ac, all squawking A1322, were tracking E which, if maintained, would keep them clear from the BE20, by now established in the RH orbit.

At 0935:07, when the BE20 was passing through W in the RH orbit and descending through FL117, one of the formation, also indicating FL117, turned towards the BE20 and was closing rapidly. The other 2 ac then also turned N towards the BE20, the first showing a level of FL110 descending and the second with no height readout. TAC gave further traffic information at 0935:23 “That traffic is tracking towards you now, I can't give you any further avoiding action”. When the BE20 was passing 290 in the turn and indicating FL115 descending, the closest military ac was indicating FL107 and heading directly towards it at a range of 2.8nm. Thereafter, at 0935:29, Mode C of the closest military ac disappeared, presumably due to garbling.

TAC then transmitted, at 0935:45, “That traffic's all around you now, I can't really give you any advice or information on them”. At 0935:51, radar shows the BE20 at FL115 with the nearest military ac at a range of 1nm with no height readout. A second is close behind, 2.8nm from BE20, with the third a further 1nm in trail. At 0936:02 the first military ac merged with the BE20 and 7 sec later the BE20 pilot transmitted “We've just got visual with the traffic now, formation of Tornados down below us”. Mode C information on the military ac reappeared at 0936:27, the first 2 showed FL107 and FL90 respectively as they broke away to the NW. The BE20 continued the RH turn inbound GOW and resumed its flight S on ADR W3D, descending to FL110.

TAC first alerted the BE20 pilot to a possible conflict at 0933:06 when the military ac were 25nm SW of his ac. Four further updates were given to keep the BE20 pilot fully informed. As the military formation was tracking E on a steady hdg that would cross W3D at a constant (but unverified) level, TAC deemed it prudent to orbit the BE20 clear of their projected flight path. This solution was working well – a lateral separation well in excess of 5nm would have been achieved

AIRPROX REPORT No 235/02.

- until the military ac turned towards the BE20 at 0935:07. Furthermore, TAC's instruction to the BE20 pilot to orbit R was more 'tactical application of RAS' rather than avoiding action since, at that point, the Tornados were 18nm SW of the BE20. Subsequently, once the Tornados were set on a course towards the BE20, there was little TAC could do other than to keep providing traffic information. No avoiding action could be given since there was no clear direction that the BE20, a twin turboprop with a cruising speed of 250kt, could be turned to evade the faster military traffic, given that it was already turning away from the approaching formation.

ATSI endorsed the ATCI report.

THE TORNADO F3 PILOTS' UNIT comments that once the formation leader had established visual identification of the BE20, it became clear that the ac had mistakenly been taken as a TOO. The Formation Leader cancelled the intercept and descended to remain clear of the BE20, with Nos 2 and 3 doing likewise. The Leader reports that he turned away at 1.5nm. The BE20 pilot reports seeing a Tornado pass 1000ft below him, which would seem to correlate with Mode C readouts on the radar replay. Nevertheless, the information seems to confirm that there was no proximity to the BE20 and no risk of collision existed.

HQ STC comments that it appears the BE20's orbit off the ADR attracted the attention of the fighter leader and made the contact look like a tactical ac rather than ADR traffic. As a result, the fighter leader presumed the contact to be a military FJ and set up a VID. A VID profile, performed on a contact that is neither an operational task or agreed training partner, is governed by the Target of Opportunity (TOO) rules in TI 4/84 AL3. Under these rules the fighters can close to a minimum of 3000ft laterally on a target of unknown identity. If the target cannot be positively identified as a military FJ by this range then the fighter must not go closer than 3000ft horizontally or 1000ft vertically. It would appear that the Leader's 'turn away at 1.5nm' was lackadaisical and he flew unnecessarily close to the minimum permitted range.

It is noteworthy that ATC initiated a turn for avoidance at greater than 10nm range, and STCA activated at over 8nm. Military crews need to be aware that even at these large separations ATC

will be concerned and initiate action. Therefore, when operating near ADRs it is recommended that crews make a courtesy call to the responsible ATC unit so as to assist other airspace users.

UKAB Note (2): UK AIP ENR 1.1.1 para 1.2 states : *"Upper ATS Routes and Advisory Routes have no declared width but for purposes of ATS provision are deemed to be 5 nm either side of a straight line joining each two consecutive points."* Furthermore, UK AIP ENR 3.1 promulgates the lateral limits of W3D as 10nm and depicted as such on RAF En Route Low Altitude Charts.

UKAB Note (3): Analysis of the Lowther Hill radar data recording reveals that at 0931:27 the BE20, code/callsign converted, is 10nm S of GUSI tracking SSW along ADR W3D and displaying FL160 Mode C, whilst the Tornado F3 formation is 28.4nm to the SW hdg E. All 3 ac in the Tornado Formation are squawking 1322 although Mode C is evident only from Nos 1 and 2. At 0934:35 the BE20, which is just commencing a RH orbit, displays 125 on Mode C whilst the Tornado F3 Formation, still hdg E, is 11.5nm to the SW with the No 1 displaying 130 on Mode C. On the radar sweep timed at 0935:01 no radar paint is evident on the Tornado Formation Leader. However, it reappears on the next sweep, timed at 0935:07, now tracking NE and displaying 117 on Mode C. The BE20, still turning R, is at 1 o'clock to the Tornado range 5.8nm and also displays 117 on Mode C. At 0935:26, Mode C on the Tornado Leader disappears. Meanwhile Tornado Formation Nos 2 and 3 have turned onto N about 2.5nm astern and to the L of No 1. At 0935:45, the BE20, displaying 115 on Mode C, appears to be approaching N, whilst the Tornado Formation Leader is in its 5 o'clock range 1nm, no Mode C, and tracking N. The BE20 appears to retain a northerly track for 2 sweeps whilst the Lead Tornado passes down its starboard side at 0.25nm; the BE20 Mode C displays 115 and 114 on respective sweeps. However, on the next sweep, timed at 0936:01, the contacts merge the BE20, apparently, having continued in its RH orbit whilst the Lead Tornado has turned L to cross underneath. The BE20 shows a secondary paint with no primary reinforcement and no Mode C. Two sec later SSR is momentarily just evident from the lead Tornado on which Mode C displays 103. On the next sweep the BE20's Mode C indicates 115 whilst none is evident from the Lead Tornado. This would suggest that the Tornado F3

crosses R to L beneath the BE20 by about 1100 to 1200ft and is broadly consistent with the BE20 pilot's report. Mode C indications on the BE20 suggest that after CPA the pilot climbs with 118 being displayed at 0936:31. The Tornado Formation Nos 2 and 3 pass 2 and 2.5nm, respectively, behind the BE20 at 0936:25. As they pass astern, No 2 displays 090 on Mode C and No 3 displays 091.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of the BE20 and No2 Tornado pilot, a transcript of the relevant ScACC RT frequency, radar video recordings, a reports from the air traffic controller involved and reports from the appropriate ATC and operating authorities.

The ATSI advisor explained that the TAY SC was powerless to prevent this occurrence. His responsibilities under the RAS provided to the BE20 crew obliged him to proffer avoiding action against the observed conflict and he did so in good time – at that stage it was just a matter of which way to turn the BE20 and how much. The resulting avoiding action RHD orbit was somewhat unusual, but it would have been entirely effective in providing the required separation had the F3s not turned toward the BE20 at a range of 11nm. From then, the Board agreed, there was little else the controller could do and he had done well to keep the BE20 crew closely apprised with traffic information on the F3 formation; as the BE20 turned about, it had drifted marginally outside Class F airspace. Once behind them the BE20 crew were unlikely to see the F3s further. Moreover, whatever instructions the TAY SC issued, the F3 formation leader was always going counter them as he closed for his VID on the BE20, thereby completely eroding standard separation criteria under the RAS.

The STC member explained that the F3 formation leader had elected to execute a VID intercept on this AI radar contact, not knowing that it was civilian GAT at the time, but in the belief that it might be a tactical exercise target. Consequently, there was effectively nothing that the SC could do to forestall this intercept, flown in compliance with established SOPs. By turning the BE20 off the ADR centreline the STC member explained that

the F3 formation leader had been deceived by the SC's avoiding action orbit into thinking that the unknown contact was a legitimate target of opportunity. In effect, it was the turning manoeuvre that attracted the F3's attention and persuaded the leader that 'ADR traffic' would not do that. The irony was not lost on members. However, some were highly sceptical and thought that there had been sufficient clues to indicate that this AI radar contact was not military traffic at all, e.g. the BE20's slow speed (220kt). However, the Board was briefed that military pilots engaged in exercises will employ deception; in this case the BE20's turn could have appeared to the F3 leader as an attempted 'kneecap' (a pre-meditated deceptive manoeuvre intended to make the attacking ac less conspicuous on the defender's AI radar). Furthermore, the reporting No2 F3 pilot had also stated that "*the contact gave erratic speed indications due to its RH orbit*". Members were not convinced, however. Sufficient clues were there and they thought the formation should have remained clear of the BE20 and the ADR. However, the F3 leader had pressed on with his VID - into Class F airspace - and directly underflew the BE20, but by that juncture in compliance with the minimum separation distances promulgated within TI 4/84 regarding intercepts/VIDs of TOO. Military pilot members opined that there was little training value in what transpired here and that the actions of the F3 leader had unnecessarily disrupted the passage of the BE20 along the ADR. Whilst the F3s were legitimately entitled to transit Class F airspace VFR, maintaining appropriate safe separation from other observed traffic, they had undoubtedly caused the BE20 crew and the TAY SC unnecessary difficulties. If nothing else, good airmanship dictated that intercepts should not be conducted in the vicinity of ADRs, where there was clearly increased potential for encounters with CAT ac. The Board concluded therefore, that this Airprox had been caused by the F3 leader, who whilst executing a VID with his formation intercepted the BE20, which had been instructed to orbit specifically to avoid a conflict with his formation.

The vertical separation could not be confirmed independently throughout the period of the intercept, as the radar recording did not reveal the lead F3's Mode C at the closest point to the BE20, but it was probably in the order of 1100-1200ft. The No2 F3 pilot reported that the lead ac was

AIRPROX REPORT No 236/02.

never less than 1000ft below the civilian ac and the BE20's FO had confirmed that it was 1000ft below when he saw the lead F3 emerge from under his ac's nose. The VID was executed in accordance with the required criteria and during this premeditated controlled manoeuvre the lead F3 pilot could have increased the separation at will. Hence, the Board concluded that no risk of a collision had existed in the circumstances reported here.

Post meeting Note: TI 4/84 training rules have been discussed between HQ STC staff and 1 Gp Defensive Ops staff who have agreed to promulgate the details of this Airprox at an F3 squadron commanders' conference in May 03. 1 Gp staff will ask the squadrons to be more respectful of the ADR structure and that ac on the

ADRs should not be seen as TOO. In the longer term TI 4/84 is being rewritten, with a view to tightening the rules and increasing the minimum separation minima between the target and the interceptor ac. Action has also been taken with regard to the use of the A132X SSR code series.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Whilst executing a VID, the Tornado F3 formation intercepted the BE20, which had been instructed to orbit specifically to avoid a conflict with the formation.

Degree of Risk: C.

AIRPROX REPORT NO 236/02

Date/Time: 18 Dec 1406

Position: 5209N 0510W (10nm NNW STU)

Airspace: AWY R14 (Class: A)

Reporter: LACC S8T Controller

First Aircraft Second Aircraft

Type: B737-200 BA46

Operator: CAT CAT

Alt/FL: FL220 FL210↑

Weather VMC NK CLBC

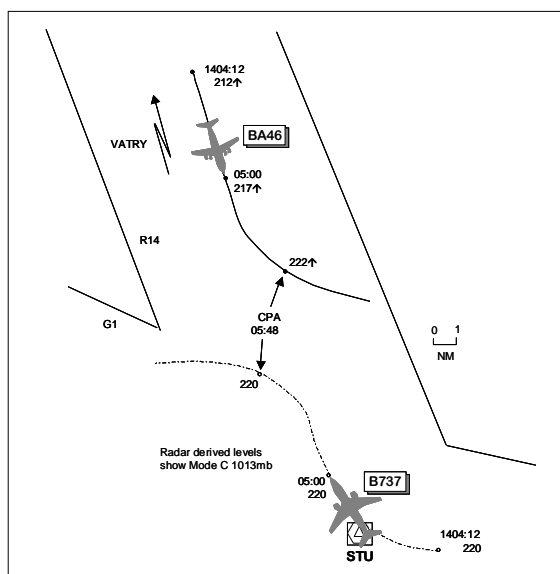
Visibility: Unltd >20km

Reported Separation:

Nil V 5nm H 8-10nm H

Recorded Separation:

200ft V 4.7nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

LACC S8 TACTICAL CONTROLLER reports that he was alerted by his Planner to the fact that the BA46 was climbing very slowly head on to the B737 which itself was just emerging from radar clutter at STU. At this point the BA46 was passing FL218, climbing to FL270. He considered giving 20° L turns to each ac but thought that this would be insufficient to preserve separation. Subsequently, he issued avoiding action to both

ac. The BA46 reported TCAS contact and the B737 reported visual. The controller believed that he had not monitored the climb rate of the BA46 closely enough against the progress of the B737 as it turned at STU. Prescribed separation was maintained.

THE B737 PILOT reports that he was initially on 'own navigation' to STU at FL220 and 420kt,

under a RCS from London on 129.37MHz. Over STU he turned for VATRY, and when about 7nm N of STU he was instructed to turn L immediately onto heading 280°. He was aware of another ac being given a turn, before he received an 'avoiding action' turn onto 270° which he promptly complied with. The other ac's TCAS symbol was seen to turn amber and the other ac was acquired visually. Minimum horizontal separation was about 5nm, and the risk assessed as medium.

THE BA46 PILOT reports that he was climbing through about FL210 on a heading of about 160° and 320kt and in receipt of a RCS from London on 129.37MHz. ATC gave two heading changes for avoiding action, the second of which resulted in a 90° change from original track. At the same time, the conflicting traffic appeared on TCAS as a TA, but no RA was received. The other ac passed abeam with a minimum horizontal separation judged to be 8-10nm, and at the same level. Risk was assessed as "nil" owing to the turns, but otherwise would have been high.

ATSI reports that the LACC Sector 8 Tactical controller (S8T) had only been in position for ten minutes at the time of the incident. He described his workload as medium-high, mainly because of the large number of ac routeing westbound on Airway/UAR G1/UG1 which were in close proximity.

The S8T explained that, when he took over the position, the B737 was already on frequency heading 320°, to keep it clear of traffic eastbound on G1, and climbing to FL220. He added that this ac was one of a number of flights westbound on G1/UG1, the SSR labels of which were overlapping on his radar display. He could not remember if the off-going Tactical Controller had warned him about the BA46, routeing eastbound on R14, which had been accepted into the sector at FL230. He thought that the flight was probably mentioned to him but only as traffic not yet on frequency.

The first ac to contact the sector, after the S8T took over, was the BA46. At 1358:30, the pilot reported climbing to FL230 direct to STU and requesting FL270. The Tactical Controller said that he was aware that the ac was only climbing slowly (it was passing FL161 at the time) and cleared it to climb to FL250. He commented that, in his experience, although it is common practice

for this particular flight not to make the accepted level of FL230 by VATRY, the boundary of CAS between Dublin and LACC, the former ATCU does not usually co-ordinate the BA46 *climbing* to that level. (It is generally recognised as standard practice that, if an ac is unable to reach its acceptance level, the flight is co-ordinated climbing to that level.) However, as the subject ac were 87nm apart at the time, even taking into account the performance of the BA46, he assessed that vertical separation would exist before the requisite 5nm horizontal radar separation was infringed. He then turned his attention to the B737 which was approaching the centreline of the airway still heading 320°. It was now clear of conflicting eastbound traffic so he instructed the flight to resume its own navigation to STU. His next transmission was to clear the BA46 to climb to FL270, its requested cruising level, and to route STU, SFD, DPE. The radar shows that, at the time, the subject ac were 77nm apart, the B737 was passing FL195 and the BA46 FL170. The latter was still 11nm W of VATRY, which it passed abeam, subsequently, at FL185. The Tactical Controller said that he still believed that the two ac would not conflict and turned his attention to the traffic situation elsewhere in the sector, notably on G1/UG1.

The S8T said that he first became aware of a potential confliction between the subject ac some four minutes later when the trainee Sector 8 Planner alerted him to the situation. At the time (1405:00) the subject ac were head-on, 14nm apart. The B737 was emerging from label clutter, maintaining its cleared level of FL220, and now on course to VATRY, but the BA46 was still only climbing through FL217. His first reaction was to issue L turns to the BA46 and the B737 of 140° and 320° respectively. Realising that these headings would not ensure separation, he passed 'avoiding action' instructions to both ac at the same time as STCA activated. The B737 was given heading 270° and the BA46 090°. The latter was also informed of traffic "*on your nose at six miles same level*". The pilot of the BA46 replied that he had the traffic on TCAS and visual. The B737's pilot also reported visual contact. The 'new' avoiding action phraseology was not used during the encounter. The S8T said that he was aware of it but in the heat of the moment reverted to what he was used to and had been trained to use. However, both pilots reacted quickly to the instruction and, consequently, separation was

AIRPROX REPORT No 236/02.

only marginally lost. The minimum separation was recorded at 1405:48 as 4.7nm horizontally and 200ft vertically. By this point the ac had reacted to the 'avoiding action' heading changes and were on diverging tracks, the BA46 having climbed through the level of the B737.

Much discussion took place concerning the performance of the BA46 and the fact this flight was unable to reach its acceptance level of FL230 by VATRY. Had it done so, on this occasion, the incident would not have occurred because vertical separation from the B737 at FL220 would have been ensured. Comment was made that, although there are no agreed procedures, Dublin ATCU usually places the ac on a radar heading if there is known opposite direction conflicting traffic. On this occasion, Dublin would not have been aware of the B737 until after the BA46 was transferred to LACC, as the ACT message is sent as the ac is approaching STU. It is not known if Dublin instructed the BA46 to be level at FL230 by VATRY. The Irish Aviation Authority (IAA) has been asked to investigate the procedures routinely used to control this flight on R14. No response has, as yet, been received. However, the issuing of further climb by the S8T to FL250 would have nullified that instruction. The MATS Part 1, Section 1, Chapter 4, Page 4 refers: *"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, e.g. 'cross ABC FL 150 or below' then the issue of a revised clearance automatically cancels the earlier restriction, unless it is reiterated with the revised clearance."* The point was also made that if the B737 had been cleared out at FL240 the incident may not have arisen. It is understood that this flight, if operated by a B737-200, as on this occasion, always requests FL220, whereas if it is operated by a B737-800 a higher level is filed and achieved.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The ATSI advisor informed members that the Irish Aviation Authority had reviewed and subsequently agreed to revise the current procedures. LACC SI 77/03 promulgates that BA46 and Avro RJ departures from Dublin on R14 via STU will be cleared to a maximum level of FL190 (ACT at FL190 max) and transferred to LACC released for climb. Although the BA46 had crossed the FIR boundary below FL230, the LACC S8T had been cognisant of this fact and that the ac was climbing slowly but was still convinced that the subject would not conflict. Members agreed with his opinion that he had not monitored the climb of the BA46 which had resulted in a minor loss of separation.

Members commended the S8 Planner trainee for alerting the S8T to the impending confliction. The S8T's turns given to both ac and subsequent avoiding action instructions, as STCA activated, had prompted the desired reaction and effect. Both crews had turned quickly in response to the ATC instructions onto diverging tracks. TCAS TA alerts were received in both cockpits as well as visual sightings by all parties. These combined actions led the Board to conclude that any risk of collision had been effectively removed.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The LACC S8T controller did not monitor the BA46's climb, which resulted in a minor loss of separation.

Degree of Risk: C

AIRPROX REPORT NO 237/02

Date/Time: 6 Dec 1036

Position: 5156N 0355W (2nm NE Llandeilo)

Airspace: UKDLFS/London (Class: G)
FIR

Reporting Aircraft Reported Aircraft

Type: Bo 105 DB Tornado GR4A

Operator: Civ Comm HQ STC

Alt/FL: 1400ft 400ft

QNH (1033mb) (Rad Alt)

Weather VMC CLBC VMC HAZE

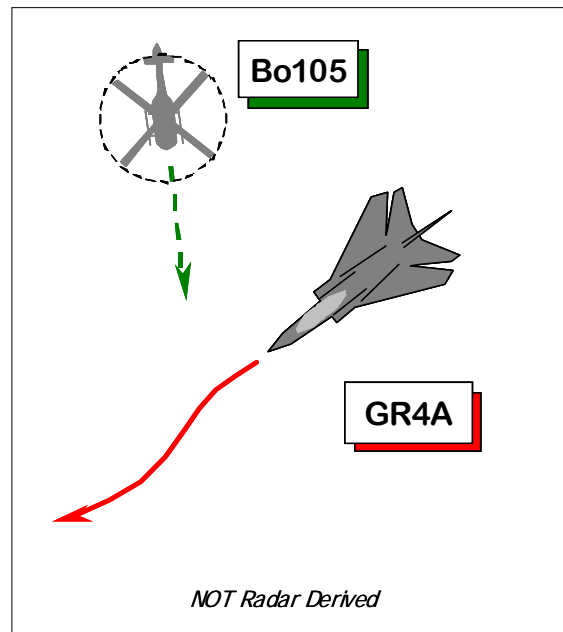
Visibility: 5km 6km

Reported Separation:

250m H, nil V 700m H, 4-500ftV

Recorded Separation:

Not recorded

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

THE BOLKOW Bo105 DB PILOT reports that his EMS helicopter has a distinctive yellow colour scheme and the double HISLs and double landing lights were all on whilst returning from the Aberystwyth area with a patient on board to the Morryston Hospital landing site at Swansea. He was flying at 110kt in VMC about 300ft below and 3000m clear of cloud with an in flight visibility of 5000m. A squawk of A0020 was selected with Mode C, and he was in receipt of a FIS from Swansea on 119.70Mhz. TCAS is not fitted.

Flying at 1400ft QNH (1033mb), about 2nm NE of Llandeilo heading 180°(M) he spotted a Tornado (with the wings swept back) on the nose crossing from L- R in a high speed 90° banked port turn (ie turning L from W to S) about 250m away at the same altitude. He took no avoiding action himself, as it appeared that the Tornado pilot had seen his Bo105 and was taking avoiding action when he saw the jet, which passed with a “moderately high” risk of a collision. If the Tornado pilot had not seen his helicopter prior to turning away then he considered the risk would have been “extremely high”, as the jet would have been on a conflicting heading at high speed.

THE TORNADO GR4A PILOT reports his ac has a grey camouflage scheme, but the HISL was on whilst flying as a singleton about 600ft below cloud at 400ft Rad Alt on a low-level reconnaissance sortie within LFA7 in the vicinity of Llandeilo. A squawk of A7001 was selected with Mode C, but neither TCAS nor a CWS is fitted. He was monitoring the LFS frequency of 300.8MHz. Whilst looking for their exercise objective heading 220° at 420kt, the helicopter was spotted on a ridgeline at about 1 o'clock. Both he and his navigator spotted the light coloured helicopter over 1nm away and they banked into a L turn to avoid it. They picked up the ‘target run’ and a minute later he banked R to continue along their pre-planned route. They were aware of the location of the helicopter throughout as they passed by 700m ahead of and 4-500 ft below the Bo105 during their ‘target run’. Whilst both members of the crew were visual with the other ac, neither he nor his navigator deemed there was a risk of collision.

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

AIRPROX REPORT No 237/02.

THE TORNADO GR4A PILOT'S UNIT COMMENTS that the approach to a simulated target area is regarded as being a busy period of flight for any recce sortie; despite this the crew saw the helicopter in good time and were able to maintain visual contact with it throughout. The crew considered the risk of collision as being zero.

HQ STC comments that the Bo105 pilot was concerned that if the Tornado had not seen his helicopter then there would be a high risk. However, the GR4 crew did see and avoid the helicopter in accordance with the VFR.

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.

This was another example of 'see and avoid' in Class G airspace, where unfortunately, the absence of recorded radar data made assessment very difficult. The helicopter pilot spotted the jet only when it passed through his 12 o'clock from L- R in a L turn away from his ac; it was apparent that this was a late sighting. Here the jet had approached from abaft the helicopter's port beam making it difficult to detect from the Bo105 pilot's right hand seat. By the time the jet was seen, the helicopter pilot would have been unable to effect the outcome of this encounter to any significant degree. Climbing into cloud was not an option because - as a BHAB member explained - many of the EMS helicopters are not fitted for IFR flight and are operated purely under VFR. It was unclear if that was the case here, but it might have been a factor. The helicopter pilot was mainly concerned as to whether the GR4 pilot had seen his small Bo105 as the jet crossed his nose just 250m in front at the same level, he judged. This was significantly closer than the distance judged by the GR4 crew members. They had spotted the small light coloured Bo105 against a cloudscape as it flew perpendicular to their track off the ridge over 1 nm away. As is

required by the 'Rules of the Air' in this situation the Tornado pilot had 'given way' and turned L to avoid it, he assessed 700m ahead of and 4-500ft below the Bo105. A distance of 1nm at 420kt is covered in 8.5 sec and a military pilot believed the L turn was the only sensible option. A helicopter member disagreed and thought a R turn to pass astern would have been preferable. However, with some high ground to the right of the jet's track, flying behind the BO105 would have involved a climb also, taking the GR4 closer to cloud and the helicopter. As it was, the jet crew's 'jink-left' would have placed them unsighted for a while in the L turn, but only for moments and from the circumstances reported here, pilots did not have any cause to be concerned at the GR4 crew's actions.

There followed a wide-ranging discussion over the principles of see and avoid and the absence of specific VFR horizontal separation minima for encounters such as these in the FIR. This encounter appeared to most members to be a conflict in Class G airspace resolved by the avoiding action of the GR4 pilot. Whereas one helicopter member contended that the GR4 pilot flew sufficiently close enough to cause concern to the Bo105 pilot, this view was not supported. In the end both pilots had seen each other's ac and the GR4 pilot had acted early enough to avoid the Bo105 unlike the helicopter pilot who took no action, because the other pilot was doing so. The only thing in dispute was the separation that had existed at the time, something that only the pilots involved could ever resolve. It was concluded, though not unanimously, that this Airprox had resulted from a conflict in the FIR/UKDLFS, which had been resolved by the GR4 pilot's avoiding action manoeuvre. This action had, effectively, removed any risk of a collision in the circumstances reported here.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in Class G airspace resolved by the Tornado GR4 crew.

Degree of Risk: C.

AIRPROX REPORT NO 238/02

Date/Time: 18 Dec 1245

Position: 5202N 0001W (3.5nm NW BKY)

Airspace: LTMA (Class: A)

Reporting Aircraft Reported Aircraft

Type: B737-800 (A) B737-300 (B)

Operator: CAT CAT

Alt/FL: FL70↑ FL80

Weather VMC CLOC VMC CLAC

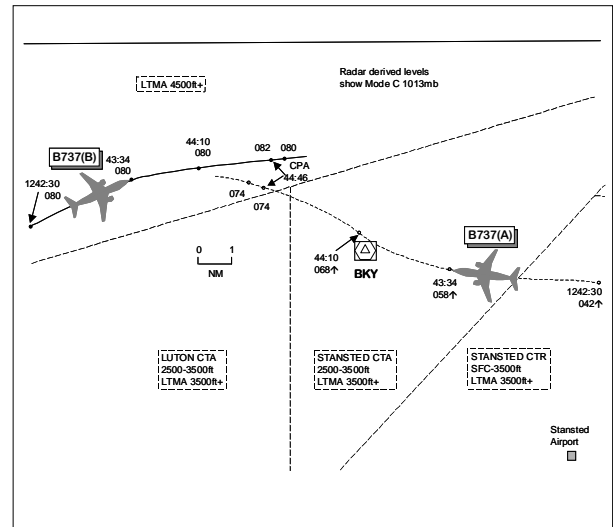
Visibility: >20km 10km

Reported Separation:

500ft V <1nm H NR

Recorded Separation:

800ft V 0.9nm H

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

THE B737 (A) PILOT reports flying a BUZAD 2S SID outbound from RW05 at Stansted and receiving an ATS from London on 119.77MHz. ATC cleared him to climb to FL70 then further on up to FL120 on a heading of 305°. On climbing through FL70 at 270kt, TCAS gave a TA warning which allowed him to acquire B737 (B) visually in level flight, about 3-4km away, at FL80 tracking towards Stansted. ATC then gave him 'avoiding action' clearance to descend back down to FL70 and to turn L, and during this manoeuvre TCAS annunciated "reduce vertical speed". He complied with the ATC instruction, reaching a max of FL74 before descending whilst he watched the B737 pass about 500ft above and <1nm away and he assessed the risk as 'high' if he had not taken action.

THE B737 (B) PILOT reports approaching BKY from CLIPY inbound to Stansted maintaining FL80 heading 090° at 220kt. Shortly after receiving a TCAS TA warning, an RA "climb" command followed, caused by a conflicting ac climbing from below in his 2 o'clock position. He disconnected the A/P and initiated a climb in response to the TCAS guidance and informed ATC, reaching FL83 before "clear of conflict" was annunciated. He had visually acquired the ac and maintained visual contact throughout the encounter.

ATSI reports that the LTCC controller described her workload and traffic loading as 'light to moderate' in the thirty minutes she had been in position on the combined TC NW Sector (i.e. NW DEPs and Bovingdon), prior to the incident. She commented that, on the morning shift in question, she had begun to feel unwell. With hindsight, she believed that this had been a factor contributing to the occurrence and recognises that she should have gone home early on sick leave. However, at the time, she had believed that she was well enough to continue working. In addition, she commented that she had moved, unexpectedly, from TC East to NW, two sectors which differ markedly in the nature of their operation. This, she considered, in itself, would not have been a problem if she had been fully fit but may have been a contributory factor on this occasion. She confirmed that she has learnt a valuable lesson as a result of this incident and would report sick in similar circumstances in future.

B737 (B) established communication with the NW Sector at 1232, reporting descending to FL150, on heading 160°. The flight was instructed to continue on the heading, high speed was approved and descent to FL130 was issued. Approximately three minutes later, B737 (B) was instructed to route to BKY and, shortly afterwards, it was cleared to descend to FL80, the agreed

AIRPROX REPORT No 238/02.

inbound level for Stansted. At 1240:40, when the ac was 18nm W of BKY, it was transferred to Essex Radar.

B737 (A), outbound on a BUZAD 2S SID, made its initial call on the NW Sector frequency, following transfer from the Stansted Final Director, at 1242:30. The pilot reported climbing to FL70, in accordance with the Standing Agreement between Stansted FIN and TC NW DEPs where Stansted BUZAD departures are cleared to cross the eastern edge of B4 level at Minimum Stack Level, and was instructed to maintain that level on reaching. The radar timed at 1242:28 shows B737 (A) on a westerly track passing FL042 (4800ft QNH 1032mb) with B737 (B), at FL80, in its 12 o'clock position, 17.9nm away. The SC said that she instructed B737 (A) to maintain FL70, not to ensure separation from B737 (B), but as an interim measure whilst she turned her attention to the traffic situation elsewhere in the sector. She admitted that she had forgotten about the presence of B737 (B) at FL80. Consequently, approximately one minute later, when the SC cleared B737 (A) to climb to FL120, on heading 305°, she had not taken B737 (B) into account. At the time the subject ac were 11.1nm apart, B737 (A), passing FL057 (6300ft QNH), was still on a westerly track but the heading change resulted in it turning, subsequently, onto a conflicting track with B737 (B). The controller explained that she believed she must have overlooked the presence of B737 (B) because of a loss of concentration, as a result of feeling unwell. She confirmed that the conflict should have been apparent from both the fps display, where the fps on the ac would have been displayed under the same designator, and/or from the radar display, where both flights would have been displayed clearly.

The SC said that she noticed the potential conflict just prior to STCA activating at 1244:13. She could not recollect if this was as a result of scanning the fps or the radar display but thought that B737 (A) was passing FL66 at the time. As soon as another ac had finished a call, she transmitted: *"B737 (A) c/s stop climb flight level seven zero turn left immediately avoiding action traffic in your twelve o'clock I say again stop climb flight level seven zero"*. The pilot acknowledged, reporting turning L with the traffic

in sight. The SC commented that she was not sure if the pilot would be able to stop his climb in time, due to the high climb rate of the ac. In fact the pilot managed to level the ac at FL74. This ensured that vertical separation did not reduce below 600ft throughout the encounter.

[UKAB Note: The CPA occurs at 1244:46 with B737 (A) level at FL74 with B737 (B) in its 2 o'clock range 0.9nm having climbed to FL82 in reaction to a TCAS RA, 800ft above. Minimum vertical separation of 600ft occurred at 6 sec later, B737 (B) having returned to FL80, clear of B737 (A), which is now 1.2nm to the E].

B737 (B) pilot had reported this climb to Essex Radar, having previously been visual with the traffic. The SC explained that she reverted to the 'avoiding action' phraseology which she was more used to, rather than the 'new' version that she had practised during TRUCE exercises. Like a number of other controllers at previous interviews, she added that she thought it important to pass executive instructions as soon as possible, rather than take up valuable time repeating the ac's callsign.

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 operating authorities.

Members could see no deep complications within this Airprox and the lesson had been learnt by the TC NW SC in believing that she was fit enough to work when feeling unwell. In a momentary lapse in concentration, she had climbed B737(A) into conflict with B737(B) without taking the latter into account.

Safety nets elsewhere had already been triggered prior to her 'stopping off' and turn instructions to the B737(A) crew, who had already been alerted by a TCAS TA warning that enabled them to see B737(B) visually before they executed the ATC instruction. Their prompt actions enabled them to stop at FL74 before descending whilst an RA alert

reinforced the ATC avoiding action. Meanwhile, the B737 (B) crew had also received a TA warning then an RA “climb” command, which was followed, visually acquiring and watching B737 (A) throughout. The actions by all parties concerned resolved the situation quickly and effectively, which led the Board to conclude that there had been no risk of collision.

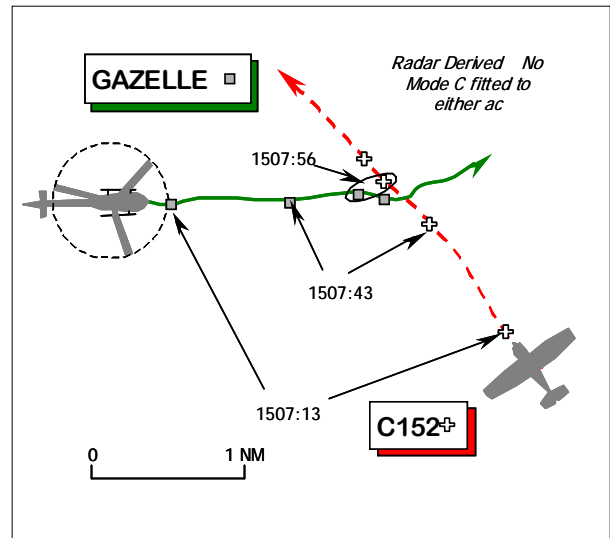
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The TC NW SC climbed B737(A) into conflict with B737(B) without taking B737(B) into account.

Degree of Risk: C

AIRPROX REPORT NO 239/02

Date/Time: 19 Dec 1507
Position: 5151N 0056E (2nm S of Colchester)
Airspace: UKLFS/London (Class: G) FIR
Reporting Aircraft Reported Aircraft
Type: Gazelle Cessna 152
Operator: HQ JHC Civ Club
Alt/FL: 500ft 1000ft
 (Rad Alt) (QNH 1027mb)
Weather VMC CLBC VMC HAZE
Visibility: 25km+ 10km
Reported Separation:
 50-100m, nil V 500ft H, 30ft V
Recorded Separation:
 0-17nm



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE GAZELLE PILOT, a QHI flying with a student, provided a brief report. His ac has a standard camouflage scheme, but the HISL was on. A squawk of A7000 was selected but Mode C is not fitted.

Flying at 500ft Rad Alt, heading 095°, 2nm SE of Colchester at 100kt, a Cessna 152 was suddenly spotted heading N 150m away, in straight and level flight at the same height. To avoid the other ac he turned R and the C152 passed 50-100m away to port. He assessed the risk of a collision as “high” and reported the Airprox to Wattisham APPROACH (APP). He was not in receipt of an ATS at the time of the Airprox.

THE CESSNA 152 PILOT, a flying instructor, reports that he was engaged in a mock PPL test

and conducting the flight as if he was a passenger. His ac has a predominantly white colour scheme with blue wing tips and large blue stripes down the fuselage sides; the HISL was on. The SSR transponder was not switched on until a few minutes before the encounter, when a squawk of A7000 was selected, but Mode C is not fitted. They were in communication with Clacton RADIO A/G Station.

Heading 340° at 90kt, to the SSW of Colchester the student had descended to 1500ft amsl to avoid cloud. However, the ac was trimmed in a slightly nose-down attitude and entered a slow descent, levelling out at 1000ft (1027mb) just before the Airprox occurred. The green Gazelle helicopter was first spotted 700ft away to port, about 30ft below his ac, by both himself and his

AIRPROX REPORT No 239/02.

student at the same time – just as the helicopter started to turn R. The student initiated an immediate turn to the R to avoid the helicopter, but he then took control and levelled the wings to aid separation against the other ac, which passed about 500ft away, but he then lost sight of it - so it might have been closer. The student switched to Wattisham APP just after the encounter, whereupon he heard a helicopter pilot reporting an Airprox in the Colchester area. He believed that the helicopter might have just lifted from a landing site at Colchester and the visibility in that direction had been poor because it was into the sun and haze. He assessed that if neither pilot had taken avoiding action a collision would have ensued.

UKAB Note (1): Analysis of the RT tape transcript provided by the ATC contractor at Wattisham reveals that at 1457:20, the Gazelle pilot reported descending into a HLS at Colchester and advised he would call again when lifting. Later at 1510:42, some time after he had departed the HLS the Gazelle pilot queried APP, “...are you talking to any civilian fixed-wing aircraft in the Colchester area?” However, satisfactory 2-way RT contact could not be established and the transmission became unreadable. At 1512:21, the C152 student called APP and reported “...overhead Colchester at 1000 feet on QNH 1027, VFR...requesting Flight Information Service”, which was agreed by APP who allocated a squawk. Whereupon, the Gazelle pilot advised APP that he was filing an Airmis (sic) against the C152. The Gazelle pilot subsequently passed brief details of the encounter over the RT stating that they had “...lifted out of Abbeyfields Colchester...near miss - probably 200 metres with [C/S] he [the C152] was routeing to the north west overhead Colchester...we were level vertically”.

UKAB Note (2): The Debden radar recording illustrates this Airprox in plan only as neither of the ac involved carried Mode C. The C152 is shown on a steady NW'ly track as the Gazelle turns from S onto E. The ac converge and at 1507:56 the avoiding action R turn reported by the Gazelle pilot is shown to take effect. The CPA of about 0.17nm (315m) is shown at this point as the helicopter turns to pass astern of the C152. The avoiding action R turn initiated by the C152 student pilot and then countered by his instructor is not shown. The Gazelle then continued eastbound as the C152 maintained its course.

HQ JHC comments that this Airprox appears to be the result of a late sighting by both pilots. The weather conditions at the time were good, with some haze affecting the visibility. Whilst this may have hampered visual acquisition of the other ac, effective lookout should have led to earlier identification of the conflict. However, appropriate avoiding action was taken to prevent a collision.

This Airprox highlights the requirement for lookout when operating VFR, especially when not in receipt of a radar service.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board recognised that in this situation the Gazelle crew was required to give way under the 'Rules of the Air', and did so, albeit that the C152 was spotted at a late stage some 150 m away and, according to the QFI's report, at the same height. The good visibility outwith the ac in the forward sector and the excellent prevailing visibility should have allowed the helicopter crew to spot the light ac earlier. However, for whatever reason, they did not and the Board determined that this late sighting was part of the cause.

From the other cockpit, the C152 flying instructor (presumably sitting in the R seat) and his student also spotted the Gazelle and took action to avoid the helicopter. However, they first saw the helicopter simultaneously 700ft away some 30ft below their ac after the Gazelle crew had initiated their avoiding action R turn. The view below from this high-wing ac on the port side should have given the student the opportunity to see the helicopter in good time and although his instructor had opined that the Gazelle had only just lifted from an HLS this was not the case. The radar recording showed that the Gazelle had been steady eastbound for a while and was reported to be cruising at 500ft Rad Alt. The Board agreed unanimously that the other part of the cause was a very late sighting by the C152 crew.

The lack of Mode C fitted to either ac precluded any independent assessment of the vertical separation that pertained here, but the Board noted that the Gazelle pilot had reported flying at a height of 500ft Rad Alt, and the C152 QFI stated that only 30ft of vertical separation had existed above the helicopter. Notwithstanding any error in assessment in the short time available, this did not jibe with the C152 pilot's reported altitude of 1000ft QNH overhead Colchester. Although the student might have inadvertently descended the C152 lower than his instructor had realised, this was conjecture and the Board was unable to resolve this apparent anomaly. Despite these late sightings, both pilots were able to effect avoiding action in the time available, though that of the C152 crew probably had little effect on the outcome. Nonetheless, the radar recording showed that only 315m horizontal separation was

achieved by the combined actions of both crews. Whilst this was sufficient to prevent a collision, in the Board's view the safety of the subject ac had been compromised. Furthermore, a GA member remarked that if the occurrence was in the close vicinity of the built up area of Colchester, the C152 crew might have encountered difficulty in "alighting clear" in the event of a power failure at this altitude, as is required by Rule 5 of the Rules of the Air Regulations 1996.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A very late sighting by the C152 pilot and a late sighting by the Gazelle crew.

Degree of Risk: B.

AIRPROX REPORT No 240/02.

AIRPROX REPORT NO 240/02

Date/Time: 22 Dec 1105 (Sunday)

Position: 4800N 1700W

Airspace: Shanwick OCA (Class: A)

Reporter: ScOACC ERC1

	<u>First Aircraft</u>	<u>Second Aircraft</u>	<u>Third Aircraft</u>
<u>Type:</u>	B747-200 (A)	B747-400 (B)	B777-200
<u>Operator:</u>	CAT	CAT	CAT
<u>Alt/FL:</u>	↑FL370	FL350	FL370

Weather VMC VMC VMC

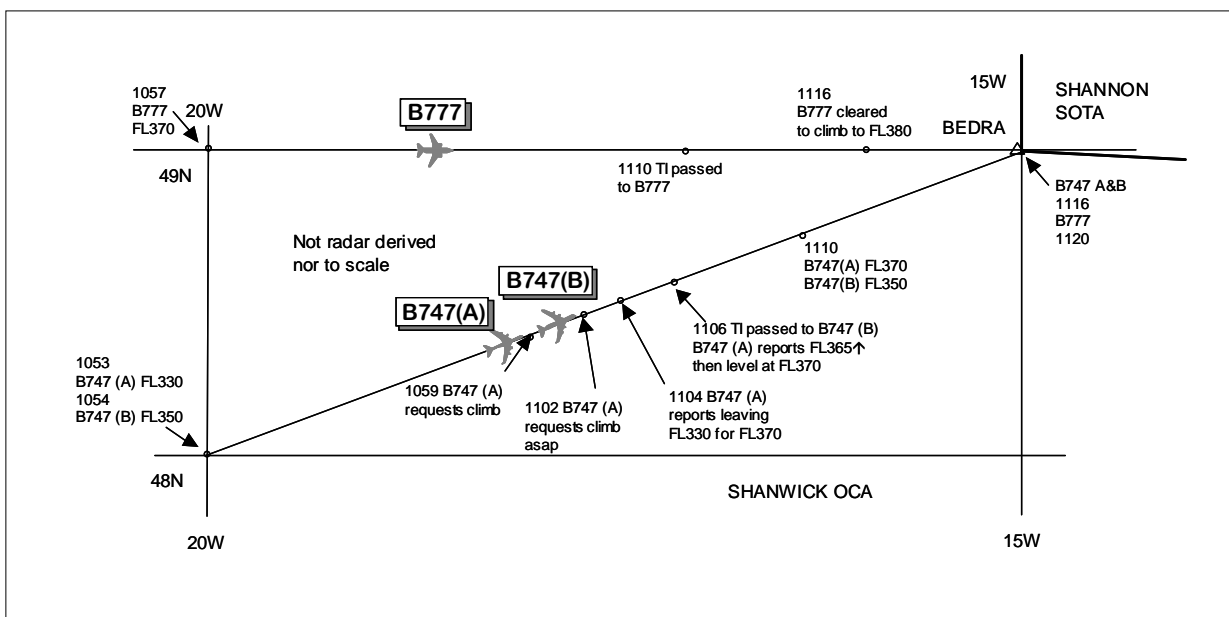
Visibility:

Reported Separation:

NK 8-12nm NK

Recorded Separation:

not recorded



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE ScOACC ERC1 reports that at 1100, B747 (A) requested climb owing to clear air turbulence but he was unable to approve climb because of conflicting traffic. Whilst investigating whether lower levels were available, B747 (A) reported at 1103 leaving FL330 for FL370. He immediately passed TI to B747 (B) who was at FL350. Adjacent Sectors were being opened to cope with the situation. He suggested to B747 (A) that he stopped his climb at FL360 as this level was

available but the crew reported level at FL370. This caused the B747 (A) to conflict with a B777 so his colleague climbed the B777 to FL380 to avoid and this was actioned immediately by the crew. B747 (B) at FL350 was also requesting climb owing to turbulence and being concerned that it may also initiate a climb without clearance, he instructed B747 (B) to maintain his level and to contact Shannon Radar for climb clearance (at approx 1114). TI had also been passed to the

B777 whilst co-ordination with Shannon Radar was continually taking place. At the time of this incident, no Sigmet were in force.

THE B747 (A) PILOT reports heading 071°T at M0-84 (488kt) en route to Milan cruising at FL330. Near BEDRA (15W) he thought, he encountered severe turbulence where his ac would not maintain its level so he requested climb. He initiated climb to FL350 and was re-cleared to FL370. No conflicting traffic was observed on TCAS, he thought.

THE B747 (B) PILOT reports heading approx E en route to Frankfurt at FL350. Near to 20W he requested to change his level via HF and CPDLC (Controller-Pilot Data Link Communications) owing to moderate turbulence; he received only a 'standby' in reply. Another ac was heard to declare an emergency owing to turbulence and that it was changing altitude without clearance. Its progress was monitored on HF and was observed on TCAS, during its climb, behind his ac by about 8-12nm which posed no threat to his flight. This event seemed to occupy the controller's attention since he never received a level change clearance, despite numerous requests during a half an hour period, nor any information on traffic which was blocking their proposed level change. Eventually climb clearance was secured when VHF contact was established with Shannon Radar.

THE B777 PILOT reports cruising at FL370 en route to Paris when on passing 19W, ATC requested him to climb to FL380 because of B747 traffic which had climbed to FL370 owing to turbulence. He was aware of this traffic's position by TCAS.

ScOACC INVESTIGATIONS reports that at the time of the incident, two positions were manned (ERC1&2) where workload was assessed as moderate. B747 (A) was flying a random route at FL330 and had reported passing 48N020W at 1053 estimating BEDRA (49N015W) at 1116. B747 (B) was following the same route at FL350 and had reported passing 48N020W at 1052 and was also estimating BEDRA at 1116. The B777 was following a random route initially to the N of the other ac but was converging to the same point at BEDRA, having passed 49N020W at 1057 estimating BEDRA at 1120.

At 1059, B747 (A) called requesting climb to FL350 or FL370 but made no mention of turbulence. Owing to conflicting traffic, a procedural re-clearance was not possible and the flight was instructed to request a higher level later when under the control of Shannon Radar. Three min later, the B747 (A) crew requested climb to FL370 as soon as possible because of clear air turbulence so the ERC1 amended the flight profile accordingly and probed for conflicts which revealed B747 (B) at FL350 and the B777 at FL370. Two min later at 1104, B747 (A) pilot reported leaving FL330 for FL370 followed one min later by B747 (B) requesting climb from FL350 to FL390 owing to clear air turbulence. The Shanwick FDPS showed that at the time B747 (A) climbed through FL350, a longitudinal separation of 1min existed instead of the required 10min and that longitudinal separation against the B777 was estimated to be 4min not the standard 15min required.

At 1106, essential TI was passed to B747 (B) whose pilot replied that he had B747 (A) on TCAS 15nm behind and that he was urgently requesting FL390. At the same time, B747 (A) reported climbing through FL365 for FL370 in severe clear air turbulence with B747 (B) showing on TCAS, and then maintaining FL370 on top and 'smoothing out'.

At 1110 essential TI was passed to the B777 at FL370 which was converging from the N towards BEDRA, 4min behind B747 (A). The B777 crew reported having the traffic on TCAS and at 1116 it was climbed to FL380.

The ERC1 had been presented with a 'fait accompli' when B747 (A) encountered severe turbulence. He had worked closely with the ERC2 and Shannon Radar controller to resolve the conflict and took all possible steps to provide the subject ac with essential TI and to climb the B777 clear of the conflicting B747 (A).

The B747 (A) crew did not declare an emergency but it is assumed that the onset of clear air turbulence was so sudden and severe that the crew considered the safety and integrity of the ac was an overriding priority.

THE MET OFFICE reports the WAFC London SIG WX chart valid at 1200UTC shows an area of clear air turbulence forecast for the area,

AIRPROX REPORT No 240/02.

moderate turbulence was to be expected between FL250 and FL380. The WAFC Washington SIG Wx chart concurs but with an upper level of FL360. Since there was no implication of anything other than moderate turbulence, a SIGMET was not issued. Forecasting areas of clear air turbulence is a difficult process and forecasters tend to rely on observed events before issuing a SIGMET. In this event, the forecaster reacted promptly to issue a SIGMET at 1145UTC following the encounter to warn following flights of turbulence.

ATSI endorsed the ScOACC report.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of all three ac, reports from the air traffic controllers involved and reports from the appropriate ATC and operating authorities.

The ERC at Shanwick was initially unaware of the B747(A) crew's reason for requesting a higher level and only after a further 3 min was the request repeated, but this time stating Clear Air Turbulence. Members agreed that the B747(A) crew should have declared an emergency, using an 'all stations' broadcast to ensure greater situational awareness by all parties involved. This would have afforded the message request a higher priority, particularly when the HF frequency was busy. Because of the inherent time delay within the HF RT message chain, the ERC was then faced with a 'fait accompli' when the B747(A) crew reported climbing owing to Clear Air Turbulence, a further two min later, without clearance and without declaring an emergency. This had caused the Airprox. A slight anomaly arose from the B747(B) crew's report which stated that they were aware that another ac had declared

an emergency owing to turbulence, but it was not known if the B747(A) crew had broadcast their intentions on 121.5MHz, in accordance with Shanwick procedures promulgated in the AIP. This point, therefore, remained unresolved. Members discussed other options available to crews faced with in flight contingencies. Procedures recommended included leaving an assigned track by turning 90° to the L or R and, if unable to maintain an assigned level (below FL410), to descend while turning to acquire a track laterally separated by 30nm from the assigned route or track. Also, if wake turbulence is encountered, the procedures recommend the use of 123.45MHz (chat frequency) to establish contact with the other ac whilst temporarily taking up a lateral offset not exceeding 2nm.

By the time the ERC had received the B747(A) 'climbing to FL370' message, separation had been lost and he had quickly passed TI to the crew of B747(B). Both crews reported TCAS contacts with each other and the pilot of B747(B) had reported being aware of the action taken by B747(A) and that it was 8-12nm behind him; no associated TCAS warnings were received. Although procedural/longitudinal separation was only 1min, not the required 10min, both ac were flying the same route, in the same direction, with the trailing ac's ground speed reducing whilst in the climb phase. These elements were enough to persuade the Board that there had been no risk of collision during the encounter.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Owing to Clear Air Turbulence, the pilot of B747(A) climbed without clearance and without declaring an emergency.

Degree of Risk: C

INDEX TO AIRPROX REPORT SUMMARIES

Serial No	Date	Types	Position	Risk	Page
102/02	02 Jul	RJ85/Jaguar	25nm SE Newcastle	A	22
104/02	03 Jul	Jaguar Pair/AS332L2	3nm NW of SMOKI	B	25
105/02	03 Jul	E145/DHC8	8nm NNW RADNO	B	31
106/02	04 Jul	Tornado GR 4/C152	6nm W of East Fortune Aerodrome	A	34
107/02	06 Jul	Jaguar/Untraced Glider	3½ NM S of Rivar Hill	B	36
108/02	08 Jul	Gazelle AH1/Robin HR200	5nm South of Woodbridge	B	38
110/02	03 Jul	MD82/B737-500	16nm E LAM	C	40
111/02	06 Jul	BA46/P3C	20nm S of Inverness	C	42
112/02	12 Jul	B737/B747	10nm W of KOKSY	C	48
113/02	14 Jul	E145/Paraglider	5nm NE SAM	C	53
114/02	15 Jul	B747-200/EF18	6½nm E of SILVA	C	55
115/02	12 Jul	VC10/Harrier GR7 x 2	12nm SW Waddington	C	59
116/02	15 Jul	JetRanger/Squirrel HT2	4nm SSE Middle Wallop	A	62
117/02	15 Jul	Robin DR36/Hercules	Woodvale	B	65
118/02	12 Jul	B767/FK10	1nm W SAPCO	C	70
119/02	16 Jul	Sikorsky S76/PA28	2nm N WOD NDB	C	73
121/02	11 Jul	ATR72/BALLOON	11.5 NM WSW GABAD	D	75
122/02	17 Jul	B757/B737	10nm NE Manchester – Elev 257 ft	C	77
123/02	19 Jul	FK 50/Hawk	2nm SSE of Humberside	C	79
124/02	19 Jul	BA46/SB20	3NM NNW HARDY	C	84
125/02	21 Jul	ASK21/C152	1.7nm SSE Halton	B	88
126/02	18 Jul	B757/PA-38 Tomahawk	LUTON RW08 Approach	C	90
127/02	21 Jul	C152/Hurricane	4nm SE LAM	B	92
128/02	23 Jul	B737(A)/B737(B)	17nm SE BIG	C	94
129/02	24 Jul	BE76 Duchess/Tucano	Overhead Humberside Airport	C	97
130/02	27 Jul	Paraglider/Light Helo	1½ nm S of Kettlewell, Yorkshire	D	102
131/02	30 Jul	BA46/E135	3nm W WAL	C	103
132/02	29 Jul	Merlin/Harrier GR7	8nm E of Boscombe Down	C	106
133/02	27 Jul	C206/Ventus 2CT	Overhead Peterborough/Sibson	C	109
134/02	03 Aug	C172/C152	2.5nm ESE Filton	A	111
135/02	07 Aug	Hawk pair/EC135	Loch Doon – 15 NM E of TURNBERRY	C	114
136/02	08 Aug	C152/ZLIN 50	O/H Gamston	C	117
137/02	13 Aug	Hawk T1A/Robin DR400	4¼nm SE of Shobdon	B	119
139/02	15 Aug	A320/B737-300	SAPCO	C	122
140/02	15 Aug	Lynx AH7/T67M	2.5nm final approach Middle Wallop	B	125
141/02	11 Aug	Paraglider/EC120	4nm NW St Catherine's Point IOW	C	127
142/02	20 Aug	Bo 105/F-15	15nm N of Swansea	B	129
143/02	19 Aug	Bo105/Jaguar	Whitland	B	131
144/02	21 Aug	B206/Harrier GR7	6.75nm W of Gloucestershire Apt	B	133
146/02	16 Aug	Kitfox/BH06L	O/H Hayling Island	B	135
148/02	22 Aug	PA 28/TB20 Trinidad	8nm SW Cranfield	A	137
150/02	27 Aug	E145/PA28	RW12 at Cardiff	C	140
151/02	26 Aug	B737/Untraced Ballon	6nm N PEPIS	D	143
152/02	29 Aug	PA28/F15E x 3	4nm WNW Hexham	B	145
153/02	31 Aug	AS332L Puma/Cessna 404	15nm N of Wick	B	147
154/02	01 Sep	B767-300/A340-300	15nm SE BEDRA	C	151
155/02	02 Sep	B737(A)/B737(B)	1.5nm S of Dover	C	154
156/02	28 Aug	Paramotor/Chinook x2	Brooklands Farm	C	158
157/02	29 Aug	F50/Tornado F3	8nm SSE FAMBO	C	160
158/02	07 Sep	Parachutists/Grumman AA5	Sibson Free Fall Drop Zone	A	164
159/02	10 Sep	Jetstream 41/Tornado GR4	5½nm SW of MONTY	C	166
160/02	19 Aug	Robinson R22/Robin DR400	5333N 0051W	B	170
161/02	04 Sep	B206B JetRanger/Tornado GR4	1nm S of Royston	B	172

Serial No	Date	Types	Position	Risk	Page
162/02	11 Sep	Do228/C130 x3	9nm NNW of Swansea Airport	C	175
163/02	15 Aug	LS8 Glider/PA34	7nm NNW of Banbury	C	177
164/02	15 Aug	Glider LS8/PA28	2nm N of the Watford Gap	B	179
165/02	09 Sep	EC135T1/Tornado GR4	Ruthin	D	181
166/02	09 Sep	B777/B757	6nm E OCK	C	183
167/02	10 Sep	JetRanger/Tornado GR4 x2	6nm SW Brecon	D	185
168/02	10 Sep	B737/BE20	5nm NW BNN	C	188
169/02	11 Sep	Bo105/Jaguar T2A	2nm SW Tawbridge	B	191
170/02	11 Sep	Viking Glider/C172	Overhead RAF Syerston	C	193
171/02	12 Sep	DR400+K21 Glider/G4	2.7nm ESE of Lasham	B	195
172/02	13 Sep	Dornier 328/Sea Harrier FA	22nm SE of Perth	C	198
173/02	13 Sep	AS355/C303	1.5nm NW Abingdon Airfield	B	05
174/02	11 Sep	PA34/PA28R	2nm S of Oxford Airport	B	07
175/02	14 Sep	Grob 103 Glider/B737-800	1¾nm NE of Lasham A/F	C	10
176/02	16 Sep	Robinson R22/Beech 200	4nm NW of Cranfield	C	13
177/02	16 Sep	C172/Hawk T1	Newcastle Emlyn	B	15
178/02	16 Sep	Jaguar T4/C150	2nm NE of Boston	B	17
179/02	18 Sep	Squirrel HT1/Squirrel HT1	1½nm NE of Pant	A	22
180/02	18 Sep	Vigilant T MK1/Dominie T MK1	13nm W of Cranwell	C	25
181/02	21 Sep	Viking T1 Glider/Jaguar GR3	Swansea Airport	C	29
182/02	21 Sep	ASK13 Glider/R3000	O/H Aylesbury/Thame G/S	B	33
183/02	24 Sep	Tornado GR4/Hawk	15nm N of Swansea	B	35
184/02	24 Sep	C172/PA32	O/H Wyton	B	37
185/02	22 Sep	B777/A321	3nm SSE OCK	C	40
186/02	25 Sept	Harrier GR7x4/Grob Tutorx2	7½nm SE of Cranwell	B	43
187/02	16 Sep	Bell 206/Single Squirrel	1nm E of Bullington Cross	B	46
188/02	24 Sep	B206/Harrier GR7	1nm N of Winkleigh	C	49
189/02	25 Sep	KA 13 Glider/Jaguar pair	3nm NE of Talgarth GS - Nr Twmpa/Lord Hereford's Knob	B	51
190/02	27 Sep	A321/B737-800	6nm N WHI NDB	C	54
191/02	02 Oct	Robinson R22/Hughes H369	0.5nm WSW Redhill	B	57
192/02	03 Oct	Squirrel HT2/Puma HC1	1.5nm SW Andover	A	60
193/02	30 Sep	Schleicher/BE58	0.6nm E of Lasham	C	63
194/02	07 Oct	BH06 JetRanger/Dominie T MK 1	6nm NNE Swansea	C	66
195/02	05 Oct	A321/B737-800	145nm N of Santiago, Spain	B	68
196/02	08 Oct	Airbus A321/Falcon 900	10nm S of E Midlands Airport	C	72
197/02	09 Oct	B206 JetRanger/Tornado GR4	5nm SE of Sculthorpe	C	76
198/02	09 Oct	AS355/Harrier GR7	2.75nm N of Machynlleth	A	79
199/02	09 Oct	A319/B737	4nm NW of TIGER	C	81
200/02	06 Oct	B757/Cirrus Glider	3nm ENE of Stoke-On-Trent	B	84
201/02	05 Oct	MW6 M/Light/DR400	2nm NE of Yate	C	87
202/02	13 Oct	C303/Beech 200	3nm SE CPT	C	89
203/02	15 Oct	CRJ7/B737	4nm SE MCT VOR	C	91
204/02	09 Oct	Bell 206/Tornado GR4	4nm NW of Colerne	C	95
205/02	14 Oct	BE40/A310	10nm SE LAM	C	98
206/02	19 Oct	Mosquito Glider/PA28	2¼nm WSW of Burn Glider Site	C	100
207/02	23 Oct	No3 Tornado F3/Firefly 260	10nm E of Barkston Heath	C	103
208/02	22 Oct	B777/B737	LAM	C	106
209/02	22 Oct	Jaguar/B737-800	3nm SE Prestwick	C	111
210/02	23 Oct	Tornado F3/Jaguar GR3A	23nm NNE of Coltishall	A	113
211/02	26 Oct	B737-700/A320	31nm NNE ORTAC	C	118
212/02	29 Oct	BAe146-200/Tornado F3	35nm S of BEKET	C	120
213/02	19 Oct	K21 Glider/PA28	6nm W of Burton-on-Trent	B	124
214/02	31 Oct	RJ1H/DC6	6.5nm SE DET	C	127
215/02	03 Sep	C152/C130J	3.5nm NW of Swansea Airport	C	131
216/02	31 Oct	B737-400/F15 'B'	13½nm NE of Lakenheath	C	133

218/02	08 Nov	TBM700/PA28	1.5nm W BIG	B	138
219/02	10 Nov	A320/B777	1nm NE OCK	C	140
220/02	12 Nov	Tornado F3/Harrier GR7	12nm SE of Coldstream	C	143
221/02	12 Nov	S-76/Tornado GR4pr	25nm E of Otringham	C	146
222/02	15 Nov	B747/B767	4nm NE AMMAN	C	151
223/02	14 Nov	FK50/ATR72	16nm ENE REFSO	C	155
225/02	28 Oct	SF34/Ka13/ASW19	7nm final ILS RW26 Londonderry	C	160
226/02	17 Nov	B767(A)/B767(B)	4646N 0268W	B	164
227/02	19 Nov	BE200/C406	5nm SE Coventry	B	167
228/02	22 Nov	BAC 1-11/Hawk	2nm NW of ADSON	B	171
229/02	25 Nov	Tornado F3 x3/S76	1.3nm N of Norwich Airport	B	175
230/02	26 Nov	DHC8/BE200	9nm NNE Southampton	B	182
232/02	05 Dec	B737-500/C406	1nm SE BIG	C	184
233/02	06 Dec	BA46/BE1900	10nm SE HON VOR	C	187
234/02	08 Dec	ATP/PA38	2nm NE Glasgow	C	190
235/02	09 Dec	BE20/Tornado F3 x3	12nm SW GUSSI	C	193
236/02	18 Dec	B737-200/BA46	10nm NNW STU	C	197
237/02	06 Dec	Bo 105 DB/Tornado GR4A	2nm NE Llandeilo	C	200
238/02	18 Dec	B737-800 (A)/B737-300 (B)	3.5nm NW BKY	C	202
239/02	19 Dec	Gazelle/Cessna 152	2nm S of Colchester	B	204
240/02	22 Dec	B747(A)/B747(B)/B777	4800N 1700W	C	207