



UK AIRPROX BOARD

ISSN 1479-2737

Analysis of Airprox in UK Airspace

Report Number 11
July 2003 to December 2003

Report by the UK Airprox Board,
'Analysis of Airprox in UK Airspace'
(July 2003 to December 2003)

produced jointly for

The Chairman,
Civil Aviation Authority

and the

Chief of the Air Staff,
Royal Air Force

FOREWORD

This is the UKAB's eleventh formal report. Like all of its predecessors, its purpose is to share widely the lessons that can be learned from the unhappy experience of others. Through this process of raised awareness, pilots and controllers can become better prepared to avoid repeating the same mistakes as their less fortunate colleagues. To this end, the report needs to be made readily available in crew rooms and rest areas so that aircrews and controllers can read it.

The UKAB aims to treat every Airprox with impartiality, while affording anonymity throughout, in the pursuit of honest and open reporting. This is the best way to uncover what happened and why it happened without attaching any blame or liability.

UKAB Report Number 11 covers full annual statistics for 2003 and also compares these with results for the previous ten years to see what trends can be identified. However, the largest portion of the report contains the Board's findings on all Airprox filed within UK airspace between July and December last year.

During 2003 there were 181 Airprox - the lowest number recorded by pilots and controllers. While this was a welcome reduction, the total was in the end influenced by a number of incidents that were filed initially but then withdrawn subsequently. Pilots and controllers (but not their management chain) are at liberty to withdraw an Airprox if, after due reflection - often in the light of more complete information than was available to them at the time - they conclude that safety was not compromised as they had originally perceived. But the choice is theirs and theirs alone. In 2003 there were 22 cases that were withdrawn in this way.

Each of the three broad pilot groups benefited from these lower numbers. The involvement of CAT pilots in Airprox was down by 20%, while a similar reduction of 15% held for Military pilots; GA pilots - the largest of the three groups - enjoyed a reduction of 7%. Much more detail on each of these groups can be found in the Statistics section of the report.

One final point that merits attention is the very positive influence that Collision Warning Systems (CWS) bring to bear. Aircraft fitted with CWS equipment enjoy a significantly lower 'risk rate' of collision than those without it. The magnitude in improvement is in the order of four to ten times better.

Gordon McRobbie

Gordon McRobbie
Director, UKAB

July 2004

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 2003	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
AIRPROX REPORTS	20

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

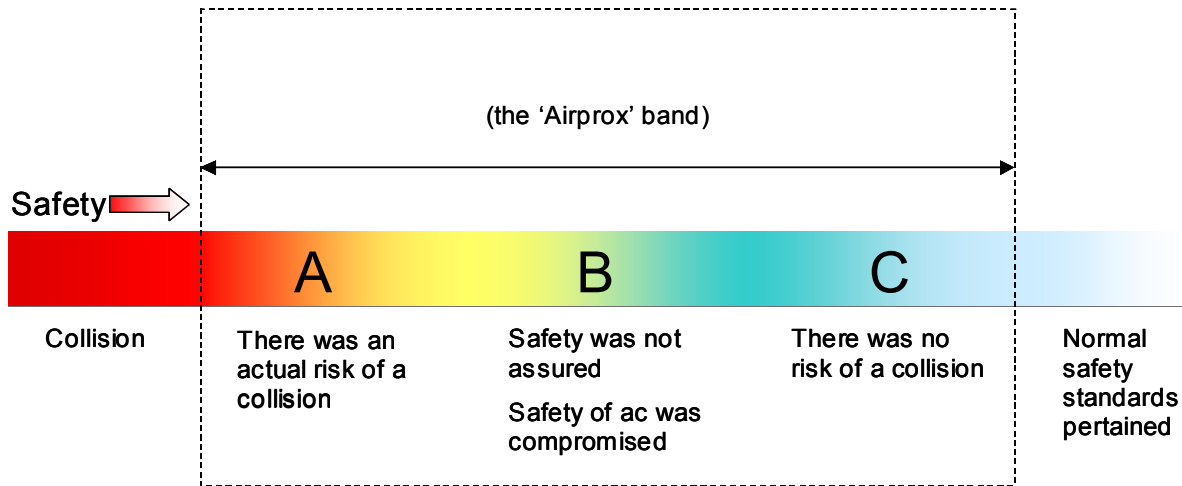
The sole objective of the United Kingdom Airprox Board shall be to assess reported Airprox in the interests of enhancing flight safety. It is not the purpose of the Board to apportion blame or liability. To encourage an open and honest reporting environment names of companies and individuals are not 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 2003

Monthly Distribution

Fig 1 and Table 1 show the distribution of Airprox during 2003. As in 2002, numbers were below expectations during the first quarter, but then increased over the summer period. They fell back again in the autumn to end the year with a count of just 181, the lowest annual total since 1990.

This total also takes into account 22 additional Airprox that were reported then later withdrawn. Reporting pilots and controllers can elect to do so if, after reflection and in the light of fuller information, they think safety was not compromised after all.

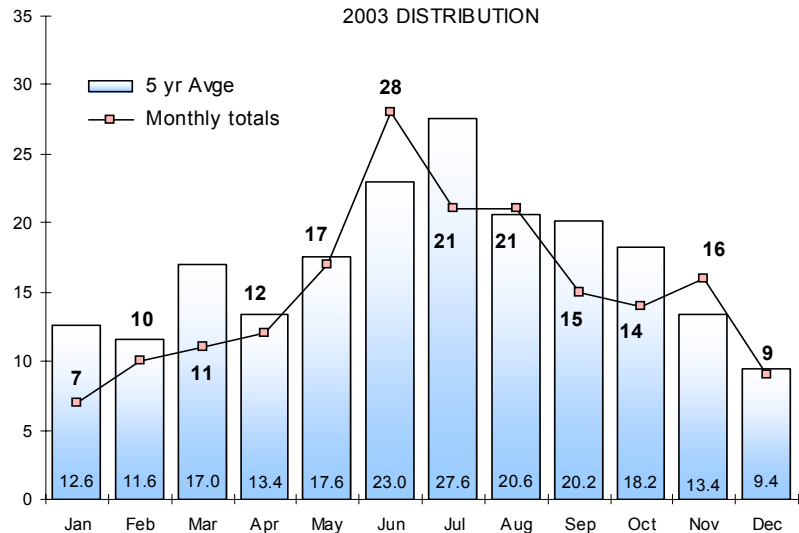


Figure 1: Monthly distribution during 2003

Table 1: Airprox distribution in 2003 against the 5-year average

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
5 yr Avge	12.6	11.6	17.0	13.4	17.6	23.0	27.6	20.6	20.2	18.2	13.4	9.4	204.6
2003	7	10	11	12	17	28	21	21	15	14	16	9	181

Trends by User Groups

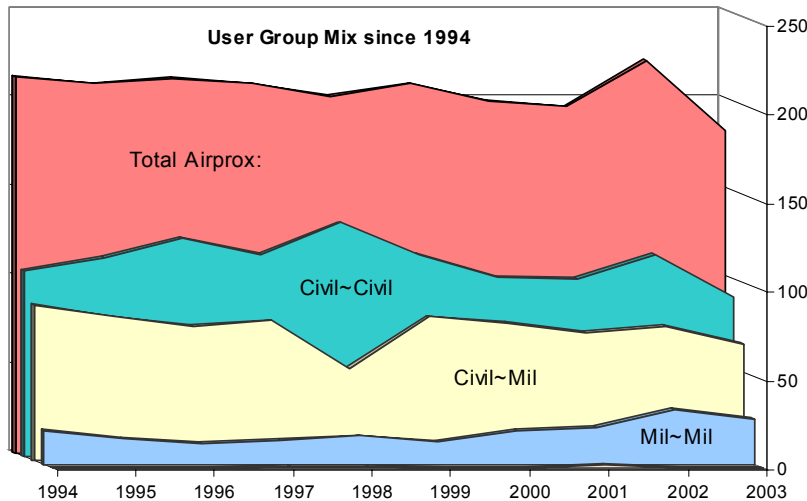


Figure 2: Airprox totals by user groups

Table 2: Airprox totals by user groups

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Unknown				1	1			2		
Mil~Mil	19	15	12	14	16	13	19	21	31	26
Civil~Mil	88	81	76	79	52	81	78	72	76	66
Civil~Civil	105	112	123	114	132	114	101	100	114	89
Total Airprox:	212	208	211	208	201	208	198	195	221	181

Trends in the number of times civil and military aircraft met over the last ten years are shown at Fig 2.

All the trends in 2003 turned downwards. Mil~Mil Airprox reduced by 5, Civil~Military conflicts were down by 10, while the count for Civil~Civil encounters fell most of all at 25. This welcome reduction of 40 incidents represented an 18% fall on the previous year's peak of 221 cases.

Setting aside the 'blip' for 2002, the 'Total Airprox' profile in Fig 2 shows that the longer term trend remains one of gradual, but steady

How pilots from various groups met each other during 2003

All Airprox 2003	CAT Helicopter	CAT Passenger	GA Hire & Reward	GA Company Aircraft	GA Glider	GA Helicopter	GA Model Aircraft - Civil	GA Private or Club	GA Training	Untraced Civil Aircraft	Military Fixed Wing	Military Glider	Military Helicopter	Weather Balloons	Unknown	Totals	Change on 2002
CAT Cargo			1													1	-1
CAT Helicopter											1					1	0
CAT Passenger		13	8		1			10	2	1	18				1	54	-22
CAT Positioning Flight								1								1	0
GA Hire & Reward		1				1		2	1		3					8	-1
GA Company Aircraft		1						2								3	+2
GA Glider			1	1	1	1		1					1		1	7	+3
GA Helicopter						3		4			8					15	-3
GA Private or Club			1			4	1	12		1	12					31	-9
GA Training	1		1			1		6	2	1	2					14	+4
Military Fixed Wing		3	1			3		8	1	1	18	1		1		37	-4
Military Glider								2			1					3	-1
Military Helicopter								2	1		2	1				6	-8
	1	18	13	1	2	13	1	50	7	4	65	2	1	1	2	181	-40

Figure 3: A breakdown of Airprox participants in 2003

The grid at Fig 3 reveals which groups conflicted and how often. The yellow column shows the pilot groups (or their ATC controllers) that filed Airprox, while those in the green row represent the other party. Positioning in either grouping does not imply being in the 'right' or 'wrong' - it is just how they met. For example, CAT pilots met Military fixed wing pilots on 22 occasions, while the latter group also met each other 18 times. The largest change on results from 2002 was experienced by pilots of passenger airliners - they filed on 22 fewer occasions. There were also significant reductions in the number of Airprox filed by GA pilots (in Private or Club aircraft) and likewise by Military helicopter pilots. Other changes were minimal.

Types of Airspace Involved

Fig 4 shows the airspace types in which the various encounters took place. Unsurprisingly, most occurred in Class G airspace, involving mainly GA and Military pilots, but 31% of the CAT pilot total also occurred in the 'open FIR'. At the other end of the scale there were some single example cases in Class E, Class F and in Danger Areas. A breakdown of pilot involvement in incidents was CAT = 64; Military = 92; GA = 118.

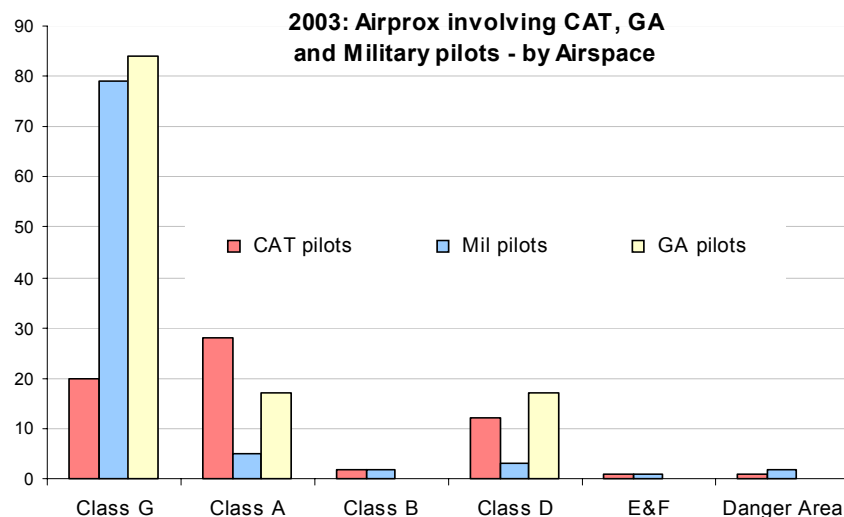


Figure 4: Airspace in which pilots experienced an Airprox

COMMERCIAL AIR TRANSPORT (CAT) SECTION

CAT Risk Results

Fig 5 (below) reveals how trends have run over the last ten years for Airprox in which CAT pilots were involved. Additionally, CAT flying hours in UK airspace are included to see if there are any direct links between hours flown and the number of Airprox - in other words does more flying mean higher Airprox numbers and/or risk? On CAT flying hours, note the levelling effect that 'Sep 11th' had - and how things are picking up once more. All of the profiles depicted in Fig 5 derive from the detail set out in Table 3.

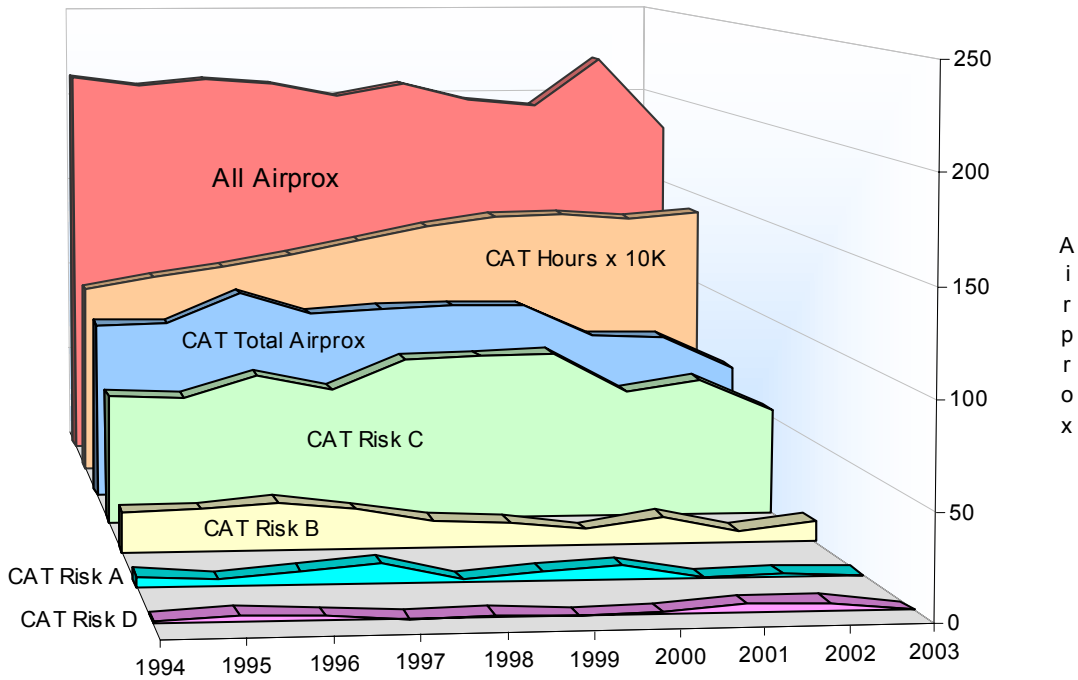


Figure 5: CAT Risk distribution 1994 - 2003

Comparing the 'CAT Total Airprox' profile with the 'All Airprox' profile shows that CAT pilots have been party to less than half the total number of conflicts. Moreover, for the last three consecutive years CAT numbers have fallen to an all time low of just 64, accompanied by better risk results. Of note, there has been just one example of a Risk A situation since 2001, while over the same period the number of Risk B incidents averaged 10 - half the figure experienced ten years ago. Further indications of improvement can be found in the proportion of Risk C returns over the last three years; on average 82% of the 'CAT cases' filed carried 'no collision risk'. Finally there was a welcome absence of any Risk D findings last year.

None of these results support the broad notion that more flying leads inevitably to more risk. There is more to it than that. One factor that does influence *Airprox risk returns*, is the type of airspace chosen for a particular flying activity. For example 4 of the 11 Risk B incidents experienced by CAT pilots in 2003 happened outside regulated airspace, where the scope for unexpected encounters is much greater.

Table 3: CAT Risk data 1994 - 2003

CAT Data	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
CAT Risk A	5	3	6	9	1	4	6	0	1	0
CAT Risk B	20	21	24	20	14	12	8	14	6	11
CAT Risk C	65	64	75	67	82	83	84	64	70	53
CAT Risk D	1	3	2	0	1	0	1	4	4	0
CAT Total Airprox	91	91	107	96	98	99	99	82	81	64
Hours x 10K	100.4	106.1	111.8	117.9	125.9	133.2	138.9	139.5	136.6	139.7
All Airprox	212	208	211	208	201	208	198	195	221	181

CAT Airprox Rates

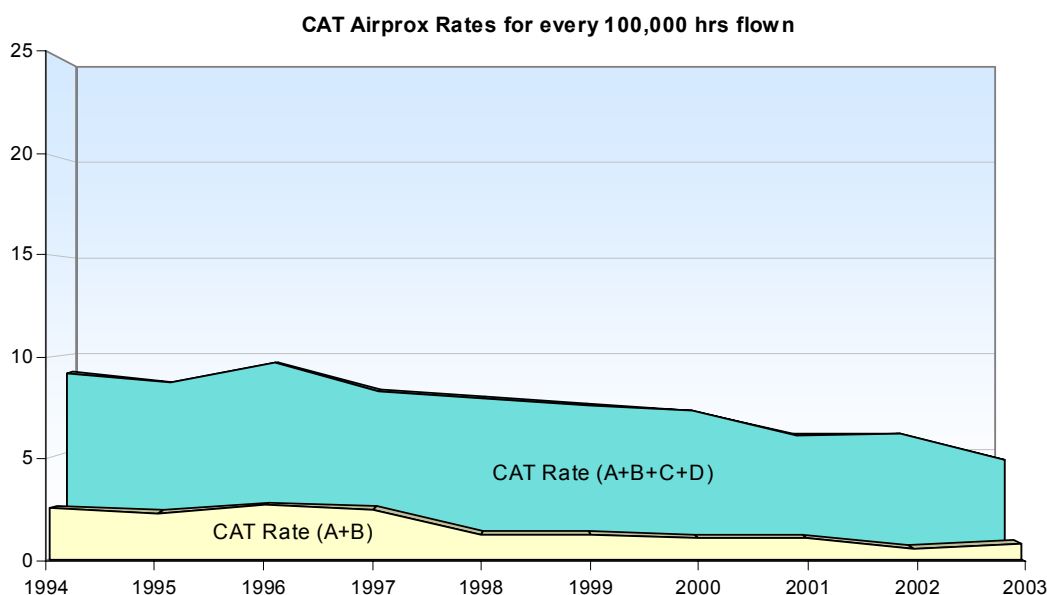


Figure 6: CAT Risk rates

Fig 6 depicts the trend in CAT aircraft *risk rates* - the number of times an event happened in 100,000 flying hours. Profiles in the chart are based on the figures set out in Table 4. Two broad points are worth noting. First is the steady decline in the total rate profile for CAT Airprox; the rate for 2003 was some 50% lower than the rate experienced ten years ago. Second is the influence of Collision Warning Systems. The step reduction in 1998 of the so called *risk bearing* rate co-incides with the introduction of TCAS. Thereafter, the *risk bearing* rate has remained consistently well below pre-1998 figures.

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

CAT Rates	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
CAT Rate (A+B)	2.49	2.26	2.68	2.46	1.19	1.20	1.01	1.00	0.51	0.79
CAT Rate (A+B+C+D)	9.06	8.58	9.57	8.14	7.78	7.43	7.13	5.88	5.93	4.58
Hours flown in K	1004	1061	1118	1179	1259	1332	1389	1395	1366	1397

CAT Pilot and Controller Causal Factors during 2003

The most common reasons behind CAT aircraft involvement in Airprox during 2003 are listed at Fig 7. Unusually, top place goes to GA and Military pilots who entered regulated airspace without clearance. The breakdown was: GA pilots = 10 occasions (resulting in 2 x Risk B, both involving untraced Microlights and 8 x Risk C); Military pilots = 7 entries (2 x Risk B and 5 x Risk C). Controllers who did not separate, or exercised poor judgement in trying to separate aircraft under their control, occupied second position.

Ser	CAT Airprox Causal Factors: 2003	Totals	Attributed to
1	PENETRATION OF CAS/SRZ/ATZ WITHOUT CLEARANCE	17	Pilot
2	DID NOT SEPARATE/POOR JUDGEMENT	16	Controller
3	NOT OBEYING ORDERS/ FOLLOWING ADVICE/ FROM ATC	8	Pilot
4	'LEVEL BUSTS'	7	Pilot
5	UNDETECTED READBACK ERROR	5	Controller
6	FIR CONFLICT	5	Other
7	DID NOT ADHERE TO PRESCRIBED PROCEDURES/INSTRUCTIONS	4	Controller
8	BANDBOXING / HIGH WORKLOAD	4	Other
9	LATE SIGHTING OF CONFLICTING TRAFFIC	4	Pilot
10	SIGHTING REPORT	4	Pilot
11	DID NOT ADHERE TO PRESCRIBED PROCEDURES	4	Pilot

Figure 7: The most common causal factors for CAT aircraft involvement in Airprox during 2003

GENERAL AVIATION (GA) SECTION

GA Risk Results

It is unsurprising that the largest of the three pilot groups who fly in UK airspace - GA pilots - get involved in more Airprox each year than either of their CAT or Military pilot counterparts. This is borne out by the profiles represented at Fig 8. Furthermore, as a group, GA pilots have the widest variation in experience levels and they fly in the most diverse range of aircraft types. At one end of the scale are extremely experienced professional aviators, handling state of the art aircraft and equipment, while towards the other end are less experienced GA pilots enjoying flight in Microlights and Hang Gliders. The point is that much of the GA pilot population in between 'turns-over' fairly regularly and this can give the appearance of the same mistakes being repeated regularly. However these 'error cycles' are probably no more than a reflection of 'new learning curves' unfolding every three years or so.

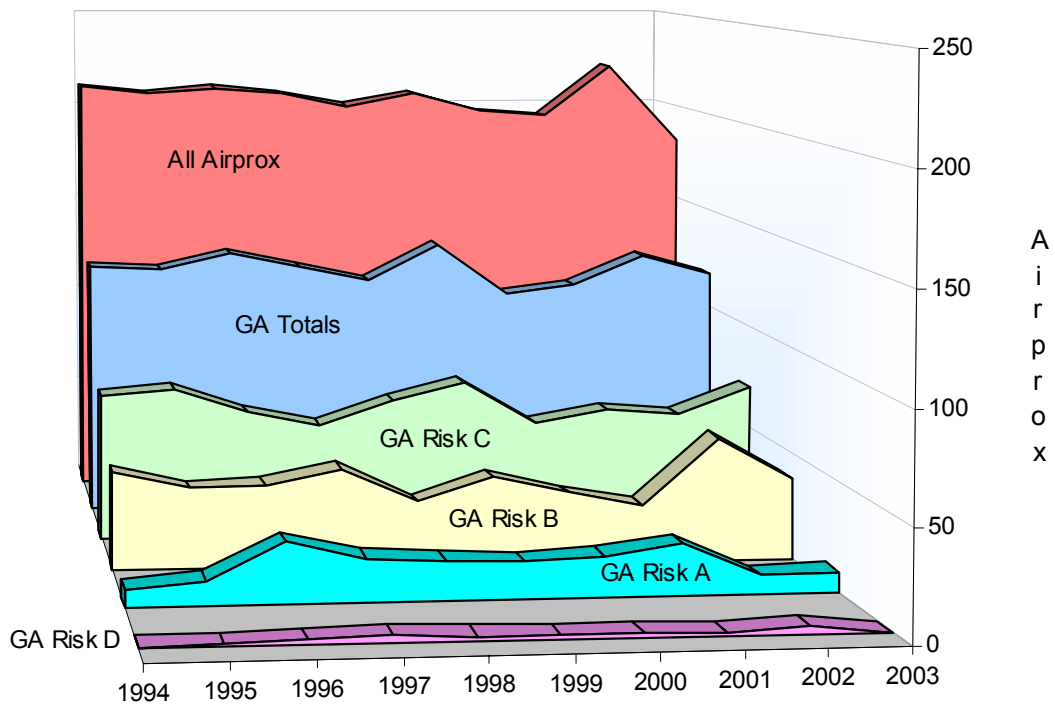


Figure 8: GA Risk distribution 1994 - 2003

Precise details on GA Airprox numbers over the last ten years are set out below in Table 5, but it is easier to see what trends are running by referring to Fig 8. 'GA Totals' have undulated in a band between 108 and 134, but the average annual count is 121, or about 60% of the All Airprox totals. In both 2002 and in 2003 the number of Risk A results were well below those experienced in the six consecutive years before that. This is encouraging progress. Moreover, the number of Risk B outcomes during 2003 was well down on the figure for 2002, which is another sign of improvement. The third area where progress shows through is in the number of Risk C returns; these rose significantly from 45% of the GA Total in 2002 to 59% in 2003. If the theory on the influence of 'changing experience levels amongst GA pilots' does hold water, these improvements might sustain for another year before downward ripples re-establish themselves once more.

Table 5: GA Risk data 1994 - 2003

GA Data	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
GA Risk A	8	11	28	20	18	17	19	24	9	10
GA Risk B	46	38	39	46	30	41	33	27	58	38
GA Risk C	70	73	61	54	66	74	54	60	57	70
GA Risk D	0	1	2	3	2	2	2	1	3	0
GA Totals	124	123	130	123	116	134	108	112	127	118
All Airprox	212	208	211	208	201	208	198	195	221	181

GA Airprox Rates

Fig 9 depicts GA risk results expressed as a rate - the number of times a result occurred in 100,000 flying hours. Two profiles are shown; one covers all GA Airprox, while the other covers *risk bearing* ones. Using rates in this way allows us to see at a glance if things are generally getting better or worse.

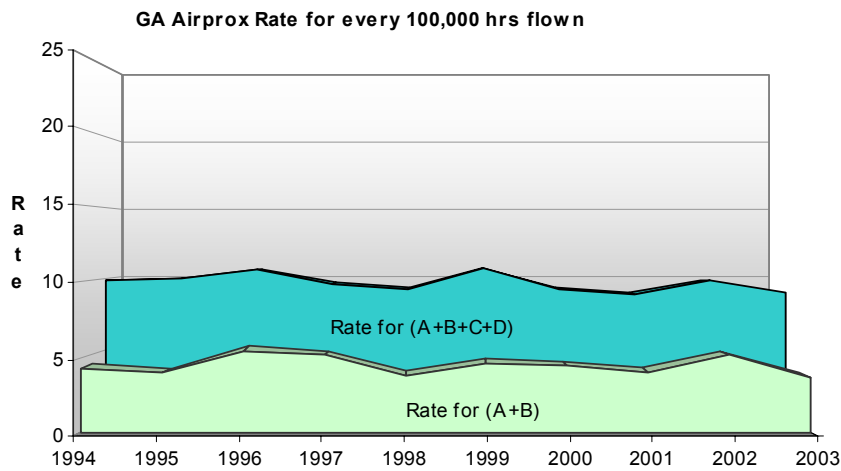


Figure 9: GA Risk Rates

Inspection of the Rate for (A+B+C+D) again highlights a three year cycle, reflected also to a lesser extent by the *risk bearing* profile. Both profiles tell us that there is no sign of things getting worse, rather that moderate improvements are achieved, if not sustained. On a positive note the *risk bearing* rate achieved last year was the best one for ten years.

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

GA Rates	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Rate for (A+B)	4.29	3.96	5.46	5.18	3.83	4.64	4.48	4.05	5.19	3.67
Rate for (A+B+C+D)	9.85	9.95	10.59	9.66	9.26	10.72	9.30	8.89	9.84	9.03
Hours flown in K	1259	1237	1228	1273	1252	1250	1162	1260	1290	1307

GA Causal Factors

Difficulties in seeing the other aircraft persists as the most common reason for 'GA Airprox'. The same problem is experienced by Military pilots. It is a complex topic with no *quick fix* solutions. Excluded from the 'ENTERED CAS' column are the two untraced Microlights referred to on page 9 (Fig 7).

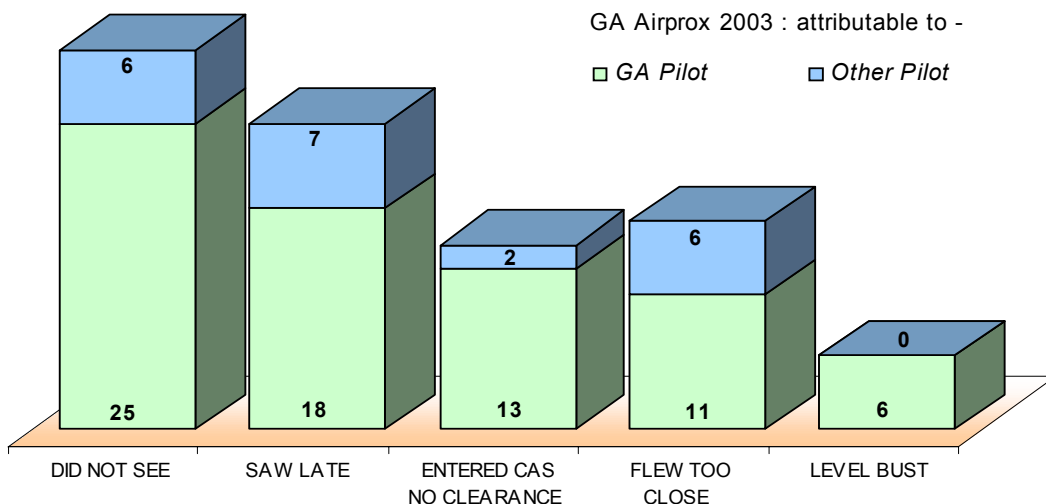


Figure 10: The most common reasons for Airprox involving GA pilots during 2003

MILITARY SECTION

Military Risk Results

Over the last ten years Military pilots have been involved in an average figure (rounded) of 94 Airprox each year. This amounts, again on average, to some 46% of the 'All Airprox' total during the period. However, numbers have varied from year to year, as can be seen from Fig 11, which shows Military risk profiles against Airprox totals at two levels. This data is based on the content of Table 7. Compared with Military annual totals in each of the three years since the millennium, Military Airprox numbers during 2003 reduced to just 92 - a level last seen in 1997.

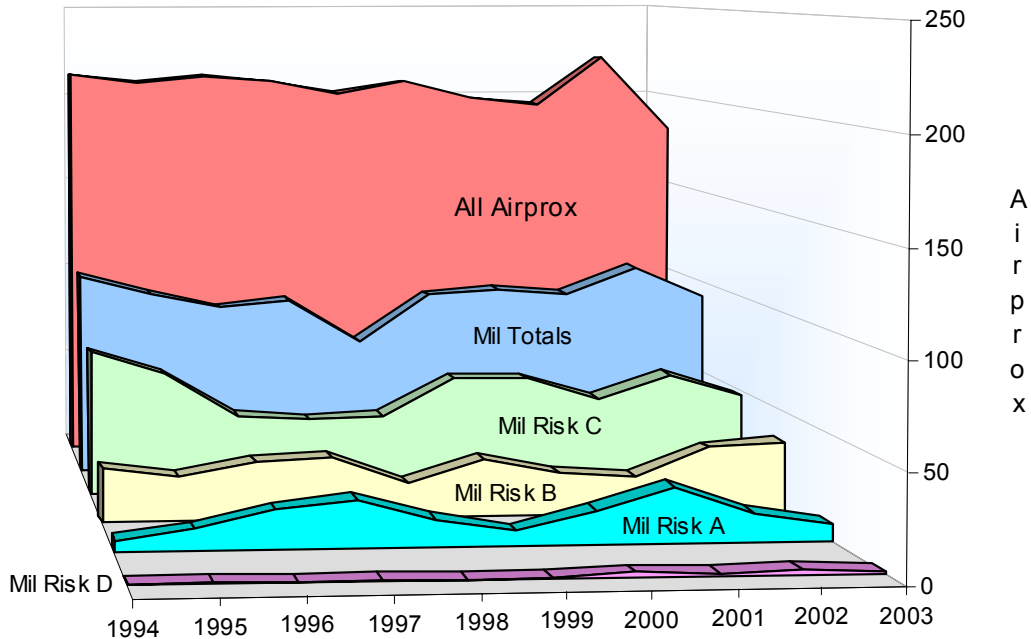


Figure 11: Military risk distribution 1994 - 2003

Even a casual glance at Fig 11 reveals that trends for all of the profiles except one slope downwards. Of most significance is the continued improvement in Risk A results - situations where there was an actual risk of collision. Following the welcome *low* recorded in 1999 the picture got worse and peaked with 27 Risk A cases in 2001. Things then reversed, however, and the very positive improvement seen in 2002 was sustained further during 2003 to reduce the total to 8 cases. At the same time the number of Risk B results during 2003 stuck closely to the pattern established in 2002. What emerges from both years - and indeed earlier ones - is that the ratio between Risk A and Risk B outcomes is very sensitive to the time taken in gaining visual acquisition. Three or four seconds leeway in sighting the other aircraft can make all the difference, and often does. Therefore, an equally important measure to judge if things are improving or not is to inspect trends in the Risk C profile. This profile needs to mimic the 'Mil Totals' profile as closely as possible in shape and volume; whenever the gap widens, it can only mean more serious problems exist further up the *risk* scale. For 2003 these problems are reflected by the Risk B profile, which plateaued.

Table 7: Military risk data 1994 - 2003

Military Data	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Mil Risk A	5	10	19	23	13	7	16	27	14	8
Mil Risk B	27	22	29	31	17	28	21	19	33	35
Mil Risk C	74	63	40	38	39	59	58	47	59	48
Mil Risk D	0	1	0	0	0	0	2	1	2	1
Mil Totals	106	96	88	92	69	94	97	94	108	92
All Airprox	212	208	211	208	201	208	198	195	221	181

Military Airprox Rates

Fig 12 uses the same base line as that used for CAT and GA rate results on previous pages - the number of times a Military Airprox occurs within 100,000 Military flying hours. This permits direct numerical comparisons both within and between pilot groups. Military profiles derive from the data set out in Table 8.

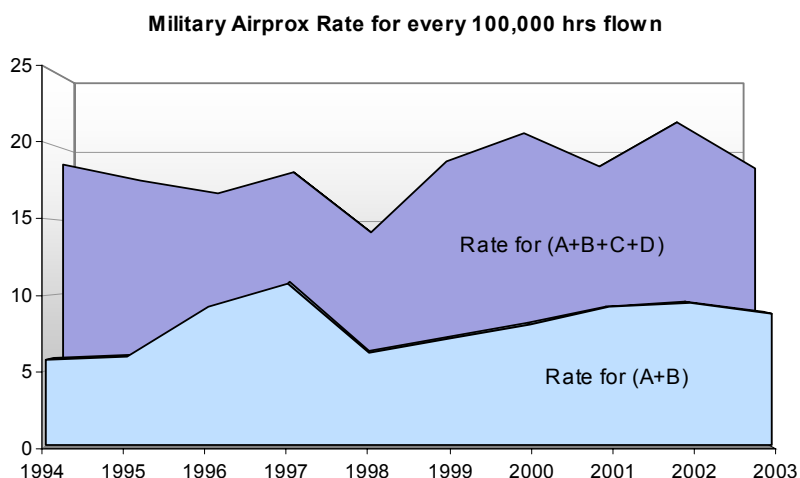


Figure 12: Military risk rates

In 2003 the so called *risk bearing* profile - the Rate for (A+B) - produced by Military pilots curved down, reversing what had previously been an unwelcome rising trend stemming back to 1998. Likewise, the overall *risk* rate for Military pilots came down last year. These are encouraging signs, particularly considering that flying hours were also slightly lower during 2003 compared with 2002.

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

Military Rates	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Rate for (A+B)	5.69	5.94	9.27	10.78	6.17	7.13	8.07	9.16	9.50	8.74
Rate for (A+B+C+D)	18.86	17.81	16.99	18.36	14.20	19.14	21.16	18.73	21.83	18.69
Hours flown in K	562	539	518	501	486	491	458	502	495	492

Military Causal Factors

The main causes behind Airprox that involve Military pilots are shown below at Fig 13. None of the leading three have changed position since 2002, but the number of times late or no acquisition was experienced fell considerably. In 2002 there were 70 examples whereas last year the count was 48. Nonetheless, difficulties in acquiring conflicting aircraft remains the number one causal factor by some considerable margin.

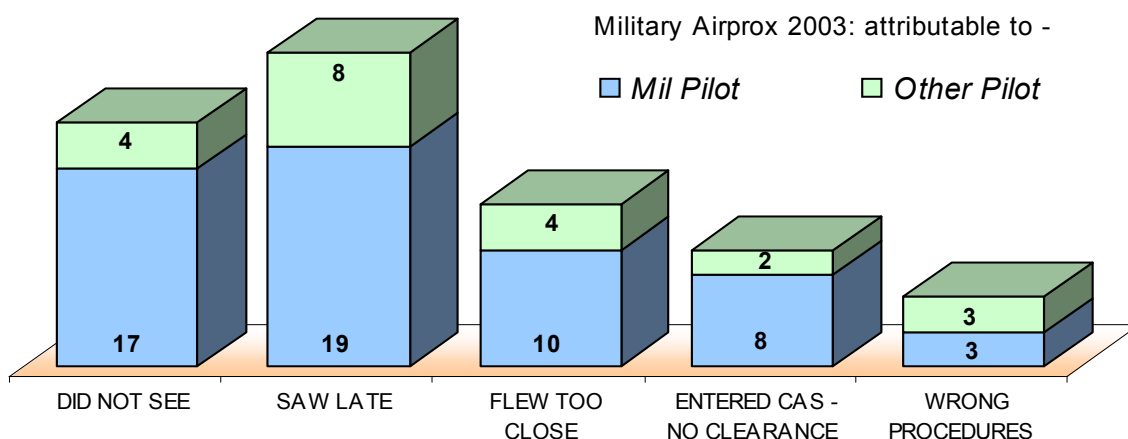


Figure 13: The most common reasons for Airprox involving Military pilots during 2003

Airprox Trends

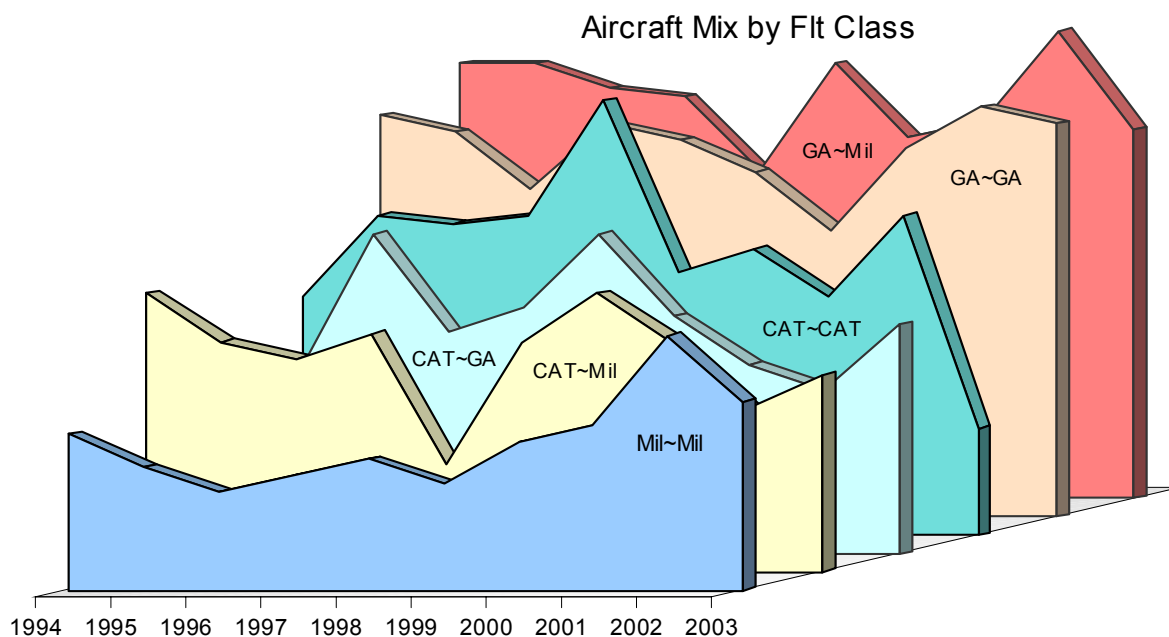


Figure 14: Airprox trends by Flight Classification

The best insight into Airprox trends between the various pilot groups is gained by breaking-out for closer inspection the six different 'pairing combinations' possible. Fig 14 does this. Precise figures can be found by referring to Table 9, which contains all of the information needed, except marginal combinations such as those against untraced aircraft and balloons.

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

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
GA~Mil	53	53	50	49	40	53	44	46	57	45
GA~GA	49	47	40	48	46	42	35	45	50	48
CAT~CAT	29	39	38	39	53	32	35	29	39	13
CAT~GA	24	22	39	27	30	39	29	23	20	28
CAT~Mil	34	28	26	29	13	28	34	28	20	24
Mil~Mil	19	15	12	14	16	13	18	20	31	23

The first thing that stands out from Fig 14 is the 'order of ranking', or the ratio of Airprox experienced by each of the groups. With few exceptions Military~Military conflicts are the least prolific year-on-year, while GA~Military meetings consistently outnumber all other combinations. The same sense of order attaches to each of the other groups in between. The pronounced dip in the 'CAT~Mil' profile in 1998 can be accounted for by the war in the Balkans - a time when many Military aircraft were absent from UK airspace on Operations. Likewise the significant spike in the 'CAT~CAT' profile for 1998 was caused by the introduction of TCAS; at that juncture airline pilots tended to file an Airprox when more properly some encounters ought to have been recorded as TCAS incidents. However, as confidence and knowledge in the system grew, the number of reported situations in which safety was thought to have been compromised appears to have fallen; this is demonstrated by the shape of the CAT~CAT profile in recent years.

Finally, the movement in trends for each group is readily apparent. For example, during 2003 the trend was downwards for four of the groups - i.e. for Mil~Mil, CAT~CAT, GA~GA and GA~Mil Airprox. The opposite held true for the other two groups, where the number of conflicts experienced rose - i.e. for CAT~Mil, and CAT~GA Airprox.

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

RECOMMENDATION. That the MoD considers:

1. The MOD considers a review of the rules for Visual Identification by military air defence aircraft in UK airspace.

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

An updated version of Training Instruction 4 of 1984 (TI4/84), containing the guidance, will be released later during 2004.

STATUS - ACCEPTED - OPEN PENDING RELEASE OF THE NEW TI4/84

Airprox 225/02 on 28 Oct 02 involving an SF34, a Ka13 Glider and a ASW19 Glider Risk C

RECOMMENDATION: That the City of Derry and the Ulster Flying Club reviews jointly their operating procedures.

ACTION: The City of Derry and the Ulster Flying Club have reviewed their operating procedures and have prepared a draft Letter of Agreement and anticipate signing a final version by August 2004.

STATUS - ACCEPTED - OPEN

Airprox 74/03 on 9 Jun 03: involving a B757 and a Learjet 35 Risk C

RECOMMENDATIONS: That the CAA considers providing an update on the review into terminology used by civil controllers when effecting avoiding action.

CAA ACTION: The CAA accepts this Recommendation. A hazard analysis has been completed by an expert working group who conducted a review on the effectiveness of the three avoiding action phraseologies. The working group used a systematic safety assessment methodology to analyze the current UK avoiding action phraseology, introduced in 2001, and two options for change; the previous UK phraseology and that published by ICAO. Due to the complexity of the assessment, the final report of the hazard analysis was presented to the ATS Standards Department of the CAA Safety Regulation Group in June 2004.

Of the three examples, the report concludes that the avoiding action phraseology used in the UK prior to 2001, is the most effective and recommends that it be reintroduced. The findings of the report are now under consideration. As introducing yet another change to the phraseology could invoke additional hazards, risks associated with such proposals are currently being evaluated and a decision is expected by August 2004.

STATUS - ACCEPTED - OPEN

Airprox 81/03 on 15 Jun 03 involving a YAK52 and an Untraced light aircraft Risk B

RECOMMENDATION: That the CAA considers a review of arrangements to ensure that when 'Permission to Display' documentation is issued, this also results in a NOTAM being promulgated, where appropriate.

CAA ACTION: The CAA accepts this Recommendation. Procedures were already in place at the time of these incidents to require that a NOTAM be promulgated when the Permission to Display was issued. The CAA has conducted an in-depth investigation into the failure to promulgate a NOTAM in these instances, but has been unable to identify the point of failure.

The CAA has reviewed and strengthened its internal procedures to ensure, as far as is practicable, that when a "Permission to Display" is issued, this will result in a NOTAM being promulgated. A requirement has also been placed upon the pilot/operator to check that a NOTAM has been promulgated prior to commencing the display.

STATUS - ACCEPTED - CLOSED

Airprox 110/03 on 17 Jul 03 involving a B757-200 and an F15E Risk B

RECOMMENDATION: That HQ 3AF investigates fully the unsubstantiated reports of the Lakenheath SRE/SSR unreliability, to ensure that the equipment is operating to a satisfactory level for the ATSS provided by Lakenheath RAPCON.

ACTION: HQ 3 AF accepts this Recommendation. A Special Maintenance Team examined the Lakenheath ASR thoroughly and concluded that the performance of the radar is fit for purpose.

STATUS - ACCEPTED - CLOSED

Airprox 145/03 on 16 Sep 03 involving a Tucano T1 and a Grob Tutor Risk C

RECOMMENDATION: That DASC, in conjunction with HQ PTC, considers conducting a widespread publicity campaign on the interaction of instrument traffic within the visual circuit area with particular emphasis at flying training units.

ACTION: HQ PTC accepts this Recommendation and has asked FTS Commanders and the Commandant DHFS to reinforce further those rules pertaining to traffic within the visual circuit where it involves the interaction of instrument traffic, in particular when on overshoot or carrying out a missed approach procedure with visual traffic. HQPTC also asked for the topic to be given stronger emphasis throughout flying training.

STATUS - ACCEPTED - CLOSED

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

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

ACTION: The CAA and the MOD are considering this Recommendation.

STATUS - OPEN

Airprox 191/03 on 26 Nov 03 involving an ATR 42 300 and a SHAR Risk C

RECOMMENDATION: MOD reviews regulations with a view to ensuring that all parties concerned acknowledge safety instructions.

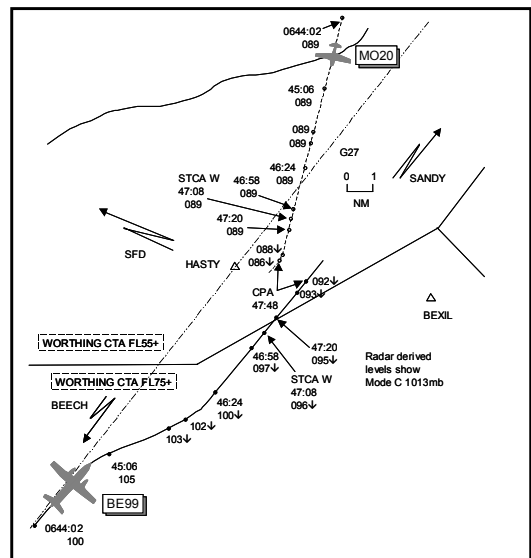
ACTION: The MOD is considering this Recommendation.

STATUS - OPEN

AIRPROX REPORT NO 96/03

Date/Time: 5 Jul 0648 (Saturday)
Position: 5043N 0037E (19nm E SFD)
Airspace: CTA (Class: A)
Reporter: LTCC SE SC

	<u>First Ac</u>	<u>Second Ac</u>
<u>Type:</u>	BE99	MO20
<u>Operator:</u>	Civ Comm	Civ Pte
<u>Alt/FL:</u>	↓FL80	FL90
<u>Weather:</u>	VMC CLAC	VMC CLNC
<u>Visibility:</u>	50km	>20km
<u>Reported Separation:</u>	nil V 3nm H	NK V 0.25-0.5nm H
<u>Recorded Separation:</u>	600ft V 1.3nm H	

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

THE LTCC SE SC reports that he was working the MO20 on a routing direct to ETRAT at FL90 and expecting the BE99 to be coming in the opposite direction descending from FL100 to FL80. The BE99 was seen to descend to FL95 30nm before the subject ac were going to cross so he descended another ac, a Gatwick I/B, to FL100. However, he then noticed the BE99 climb back up to FL100 so he stopped the descent of the I/B at FL110 but the BE99 was seen to continue its climb up to FL105. On contacting the LACC LYD Sector to enquire what was happening, he was informed that the SFD Sector was working the Beech but on calling SFD they told him that LYD was working the ac. The BE99 was then seen to descend when 3nm from the Mooney so he descended the MO20 to FL70, passed TI and avoiding action, the Beech eventually levelled at FL80. A long time before the incident he had noticed the BE99's Mode C level fluctuating, which was why he had called the LYD and SFD Sectors, but in the end he still did not know who was controlling the Beech at the time of the incident.

THE LTCC S COORDINATOR reports he telephoned the LACC DVR/LYD Planner when he was made aware, by the BIG SC, that there was a problem with the BE99. The Planner told him that the BE99 would be maintaining FL100, to remain above the MO20 flying in the opposite direction at FL90, and that it would be transferred to the BIG SC released for descent subject to the MO20. The Beech was seen to continue its descent through FL100 so he called the DVR/LYD Planner again to re-confirm that the BE99 was maintaining FL100, as previously agreed, however, at this point separation was lost between the subject ac. He advised the BIG SC to give avoiding action.

THE BE99 PILOT reports flying solo heading 040° at 210kt inbound to Southend and in receipt of an ATS from London on 128.42MHz squawking 5276 with Mode C. TCAS was not fitted. The visibility was 50km 4000ft above cloud in VMC and the anti-collision, nav and strobe lights were all switched on. After being cleared by London (LACC) to route via SANDY with descent to FL80 he was then transferred to LTCC. He commenced his descent and reported in on the new frequency but was told to standby. He tried repeatedly to establish two-way communications but the controller was busy and told him to standby on each occasion. During this period he saw a low wing jet, he thought, climbing through his level, he thought, and turning away in accordance with ATC instructions, passing approx 3nm clear. Finally, after his call was acknowledged, ATC asked what he was doing descending to FL80 to which he replied that the clearance had been given by the previous controller. He assessed the risk of collision as low. He added that the propeller configuration on this type of ac (1m ahead of the pilot's head with

AIRPROX REPORT No 96/03

blade tips 4" from fuselage) created a loud cockpit noise which made ATC instructions difficult to hear clearly.

THE M020 PILOT reports heading 195° at 150kt cruising at FL90 en route from Stapleford to France and in receipt of a RCS from London squawking 2261 with Mode C. TCAS was not fitted. The visibility was >20km in VMC and his strobe lights were switched on. ATC instructed him to descend to FL70 then (10-20sec later) he was turned R onto heading 270° and passed TI on an ac on his port side. He saw the traffic immediately 0.25-0.5nm away but, as he was already turning, it disappeared very swiftly from view; it was still above his level at that time. He assessed the risk of collision as low.

LTCC ATCI reports the M020, which was en route from Stapleford to Aurillac in France via airways G27 and A34, came under the control of the TC SE SC at 0621; its pilot reported climbing to 4000ft. At 0630, when the ac was in the vicinity of the DET VOR it was cleared up to FL90, then up to FL100 and shortly after that, was instructed to stop its climb at FL90. By 0635, when the ac was a little over 12nm N of LYD, it was instructed to turn R on to a heading of 195°. This instruction was later amended for the ac to route direct to ETRAT, a reporting point where airway A34 crosses the French coast. By 0644 the M020 was crossing the English Coast 12nm SW of LYD at FL90.

At the same time, the BE99 routeing from Guernsey to Southend, NE bound via airway G27, but still under the control of LACC, was overhead BEECH at FL100. The ac had been the subject of co-ordination between TC South and LACC, the former accepting the ac at FL100. During the previous few minutes the BE99 had been observed by the SE SC to have shown fluctuations in its Mode C, varying between FL104 and FL096. In an effort to determine the accuracy of the displayed information the SE SC endeavoured to contact the LACC sector controlling the ac. At 0645 the SE SC telephoned the LYD sector (S17) to be advised the ac was under the control of the SFD sector (S18). The SE SC then contacted the S18 Planner. Apart from concerns with the opposite direction M020 at FL090, the SE SC was also concerned about other traffic he had cleared down to FL110. He was informed by S18 that LYD (S17) had been working the BE99 for some time and advised that it would be maintaining FL100.

The BE99 pilot called the TC SE SC at 0647.00 reporting inbound to SANDY and descending to FL080. The SE SC instructed him to standby. At this point the BE99 was descending through FL097 with the opposite direction M020 in its 11 o'clock at a range of 5.7nm. Shortly after the call from the BE99, Short Term Conflict Alert (STCA) activated with a low severity alert (white) between it and the M020; the SE SC instructed the M020 (0647:10) to "*descend now FL70*".

The BE99 pilot made a second call to the sector at 0647.21, advising he was inbound to SANDY and descending to FL80. Again the ac was instructed to standby, this time to allow the SE SC to pass avoiding action to the M020, instructing a turn R on to 270°. TI on the conflicting traffic was not passed at this time.

STCA changed to a high severity alert (red) at 0647.45 which coincided with TI being passed by the SE SC to the M020 on the opposite direction traffic. The M020 pilot reported he had the traffic in sight.

[UKAB Note (1): The CPA occurs at 0647.47 when the BE99 had the M020 in its 9 o'clock at a range of 1.3nm and 600ft below.]

It would appear that the SE SC was unaware that the BE99 had been on his frequency for almost one minute; when the BE99 pilot made his third attempt to establish contact at 0647.56 he was again instructed "*would you please standby*".

By 0648.15 the SE SC was explaining the matter to the M020 pilot, erroneously stating that the other traffic was not working him, but another sector, and should have been maintaining separation of one thousand ft. The M020 pilot stated that there had been no problem with the event, considering that there had been good separation. By that stage standard lateral separation had been achieved.

The SE SC, aware that an ac had been endeavouring to establish two way contact with him made a general announcement for the *“ac calling before, say again please”*. It was at this point (0648:50) that the BE99 pilot made his fourth transmission on the frequency and finally established two-way communications. The SE SC explained that he had anticipated the ac at FL100 and avoiding action had to be taken. The BE99 pilot explained that the previous SC had cleared him down to FL80.

ATSI endorsed the LTCC report.

UKAB Note (2): The LACC S17 RT transcript reveals the following RT exchange:-

0645:00 BE99 pilot transmits *“BE99 c/s any chance for direct Southend”* to which the S17 SC replies *“BE99 c/s you can descend now flight level eight zero”*.

0645:10 BE99 pilot replies *“descend flight level eight zero BE99 c/s”*, however the SC immediately transmits *“BE99 c/s disregard maintain flight level one hundred on reaching traffic opposite direction one thousand feet below your level”*.

0645:20 BE99 pilot replies *“will maintain one hundred BE99 c/s”* followed by the SC transmitting *“and BE99 c/s route direct to Sandy initially please”*.

0645:30 BE99 pilot replies *“direct Sandy BE99 c/s”*.

Forty sec later (0646:10) the BE99 is transferred to the LTCC SE frequency and following an incorrect frequency readback by the pilot, the correct frequency is read back just before 0646:30.

UKAB Note (3): The BE99 pilot contacted UKAB 3 weeks post incident following his receipt of an audio copy of the RT exchange detailed in UKAB Note (2) provided to him by LTCC ATCI. He was amazed/stunned that he had read back the revised descent clearance to FL100 but had continued down to the originally cleared level of FL80; this was not how he had remembered the facts.

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 events leading to the Airprox were not unusual. The standing agreements between LACC and LTCC would normally have led the BE99 to descend to FL80. However, the descent clearance issued by LACC S17 had been immediately countermanded to FL100 and this had been correctly read back by the BE99 pilot. Further transmissions revising the route clearance were given and, following a challenged incorrect frequency readback, the Beech was transferred to LTCC. From his report, the Beech pilot could not remember acknowledging and reading back the revised descent clearance – to stop at FL100 – and so for whatever reason he descended below his cleared level and into conflict with the MO20. This had caused the Airprox.

It was unfortunate that the LTCC SE SC did not realise that the BE99 pilot was calling him during the incident. Ironically, with the SE SC focusing his attention on the developing situation and proactively seeking information from other controllers on the subject Beech, he then apparently ignored it when the pilot did call.

In the absence of any TCAS safety net, the pilots of the subject ac were unaware of the unfolding incident. As STCA activated, the SE SC gave the MO20 pilot descent to FL70 and then a R turn to the W for avoiding action; TI enabled the pilot to acquire the Beech visually, he thought 0.25-0.5nm away to

AIRPROX REPORT No 96/03

his L as they passed, above him but descending. The Beech pilot had twice called descending to FL80 but was told to standby, during which period he had heard the SE SC pass avoiding action to the Mooney and saw it pass to his L, he estimated 3nm away. The radar recording revealed the BE99 crossing >3nm ahead of and 600ft above the Mooney, descending and eventually passing 1.3nm abeam and still 600ft above it. Although resolution by the SE SC had been one-sided, the descent and turn instructions given to the Mooney pilot had ultimately increased the separation distance between the subject ac. All of these elements when combined were enough to persuade the Board that any risk of collision had been effectively removed.

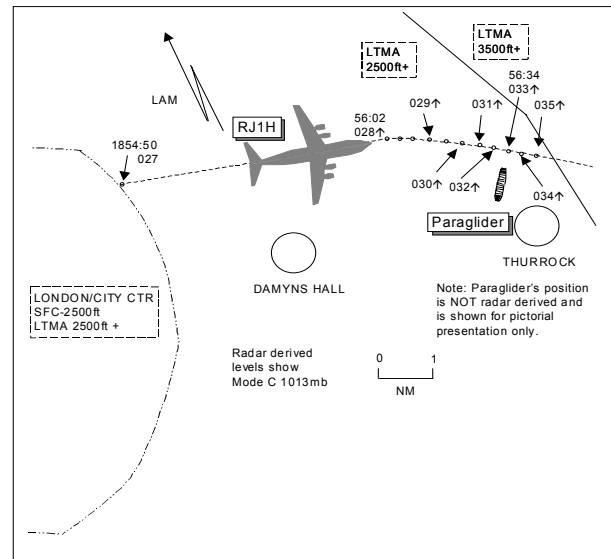
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The BE99 pilot descended below his cleared level and into conflict with the MO20.

Degree of Risk: C.

AIRPROX REPORT NO 97/03

Date/Time: 7 Jul 1856
Position: 5134N 0022E (9nm SE LAM)
Airspace: LTMA (Class: A)
Reporting Ac Reported Ac
Type: RJ1H Untraced
 Paraglider
Operator: CAT NK
Alt/FL: 3500ft ↑
 (QNH 1022mb)
Weather VMC CLBC
Visibility: >10km
Reported Separation:
 100ft V 0.8nm H
Recorded Separation:
 NR

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

THE RJ1H PILOT reports outbound from London/City at 250kt and in receipt of an ATS from Thames Radar on 132.7MHz squawking 0540 with Mode C. Climbing through 3500ft altitude cleared to 4000ft, he sighted a yellow coloured parafoil in his 1 o'clock travelling in the opposite direction. He had just rolled out onto a heading of 085°, he thought, which provided separation from this ac; no avoiding action was required. The other ac passed within 100ft vertically (above) and about 0.8nm horizontally to the R of his ac. He informed ATC of the incident and assessed the risk of collision as medium.

AIS MIL reports that despite tracing action, the identity of the paraglider remained untraced. Following consultation with the BHPA, it was established that a yellow paraglider did operate from a field site in the area but the operator could only confirm he had not been airborne on the day in question as his ac was unserviceable with a broken propeller.

THE THAMES RADAR CONTROLLER reports that the RJ1H departed from RW28 at London/City following a DVR3T SID. The ac was vectored onto heading 085° and told to maintain 3000ft owing to inbound conflicting traffic at 4000ft. After the two ac had crossed, he cleared the RJH1 to climb to 4000ft (approx position LON 083R 28D). About 3nm further on, the RJ1H pilot reported visual with an unknown yellow paraglider at 3500ft QNH 1022mb; no contact was seen on radar. He acknowledged the pilot's report and transferred him to London on 120.17MHz. Later, the pilot informed London/City TOWER of his intent to submit a written report.

UKAB Note (1): Met Office archive data shows the London/City METAR EGLC 1850Z 28006KT 240V320 9999 SCT 045 21/11 Q1022=

ATSI reports that the RJ1H departed London City at 1851 following a DVR3T SID. The Thames Radar controller instructed the ac to fly a heading of 085° and to maintain 3000ft on reaching. This was owing to inbound traffic at 4000ft. Once the two ac had passed, the Thames Radar controller instructed the RJ1H to turn R heading 105° and climb to 4000ft; its position, at that time, was approximately 6nm SE of LAM. Having acknowledged the instruction, the crew of the RJ1H advised that they had just passed close to a paraglider at 3500ft. Later analysis of the radar recording showed no return from that ac. The RJ1H remained within CAS airspace at all times and there are no apparent ATC implications.

AIRPROX REPORT No 97/03

THE BHPA comments that from the location, time of day and met conditions the BHPA is 99.9% sure that this was a paramotor as opposed to a paraglider. The term parafoil is a term used in Europe to describe the wing regardless of it being powered or freeflight.

There are disappointingly marked similarities between this event and a previous Airprox (145/02) involving an untraced paramotor.

[UKAB Note (2): Airprox 145/02 was subsequently withdrawn by the filing pilot and investigated by CAA SRG under the MOR scheme.]

UKAB Note (3): Analysis of the Heathrow radar recording proved inconclusive. At 1850:40 the RJ1H is seen 5nm NE of London/City squawking 0540 with Mode C indicating level at FL027 (2970ft QNH 1022mb). The RJ1H is seen at 1856:02 to commence a R turn, rolling out on a track of 100° 10sec, later, and to commence a climb. No other radar returns are seen in conflict, the RJ1H climbing through FL033 (3480ft QNH) at 1856:34, the level reported by the RJ1H pilot when he saw the paraglider in his 1 o'clock.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilot of the RJ1H, a tape recording of the relevant RT frequencies, radar video recordings, reports from the air traffic controllers involved and reports from the appropriate ATC and operating authorities.

It was clear that this Airprox had been caused by the unauthorised penetration of the LTMA by an untraced Parafoil pilot. Any infringement of Class A airspace is a serious matter and invariably leads to conflict with the established flow of traffic. During a busy phase of the flight, fortunately the good weather conditions permitted the RJ1H crew to see the Parafoil after rolling out onto an assigned heading. Although no avoiding action was necessary because of the lateral separation that pertained, this was by chance and not design. There had been potential for a closer conflict but fortunately in this instance the outcome was benign, the Board concluding that during this encounter there had been no risk of collision.

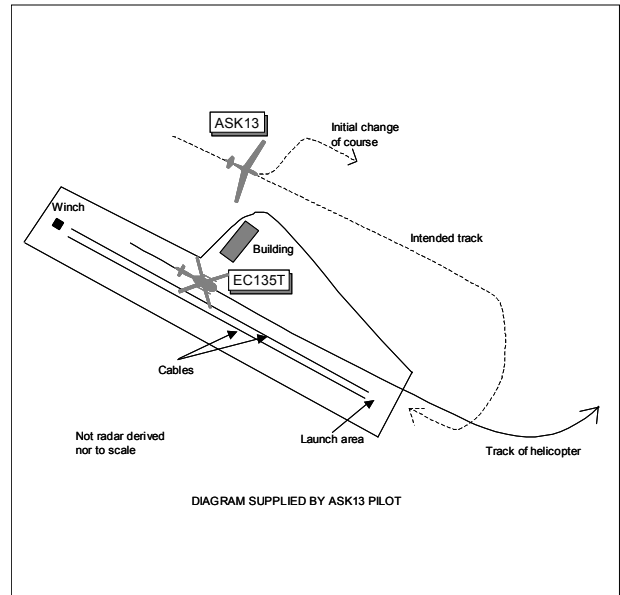
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Unauthorised penetration of the LTMA by an untraced Parafoil pilot.

Degree of Risk: C.

AIRPROX REPORT NO 100/03

Date/Time: 6 Jul 1017 (Sunday)
Position: 5353N 0237W (O/H Chipping G/S - elev 600ft)
Airspace: FIR (Class: G)
Reporting Ac Reported Ac
Type: ASK13 EC135T
Operator: Civ Club Civ Comm
Alt/FL: 700ft↓ 1500ft
(QFE) (QNH 1020mb)
Weather VMC CLBC VMC CLBC
Visibility: Unltd >10km
Reported Separation:
nil V 100m H nil V 400m H
Recorded Separation:
NR

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

THE ASK13 PILOT reports flying solo heading 120° established on the D/W leg of a RH cct at Chipping Glider Site at 55kt and 700ft QFE descending. The visibility was unlimited 1500ft below cloud in VMC and the glider was coloured red/white but did not carry a radio. The site was active with winch launching operations, using 2 cables, up to 1250ft agl although, at the time of the Airprox, no other gliders were in the cct. She saw a dark blue/yellow coloured helicopter when it appeared abeam her starboard wing 100-150m away at the same level; it was flying straight and level down the length of the glider site. Her first reaction was to roll immediately to the L of her intended track to increase horizontal separation before turning back onto D/W heading and to indicate her awareness of the helicopter to its pilot. There was no indication that the helicopter pilot had recognised his position over the glider site or was aware of her position in the cct. She was concerned about the potential conflict if the helicopter altered course to the L to fly across her intended flight path. She reduced speed to 50kt whilst being gradually overtaken by the helicopter, which overflew the launch area and airfield boundary, before it eventually altered course to the L.

THE EC135T PILOT reports heading easterly at 125kt and 1500ft QNH 1020mb and in receipt of FIS from Blackpool APPROACH on 119.95MHz. The visibility was >10km 2000ft below cloud in VMC, the helicopter was coloured dark blue/yellow and strobe lights were switched on. TCAS was fitted to the ac. Near Chipping Glider Site he saw a white/red glider in his 10 o'clock range 500m at about the same level, it had been initially obscured from view by the windscreen centre pillar. He made a slight R turn away from the glider, as the speed difference meant no greater action was required, the glider passed 400m clear to his L. He did not feel, at the time, that it had been an Airprox and he assessed the risk of collision as low.

CAA FLIGHT OPERATIONS INSPECTORATE HELICOPTERS (FOI H) reports that the helicopter was flying between 2 operational tasks and the GPS was programmed for a direct track which took it over the glider site. The EC135 crew became aware of the site and glider at a late stage but in time to avoid the glider. The crew have been reminded not to over-rely on GPS for VFR navigation and to be aware of terrain and airspace between waypoints.

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

AIRPROX REPORT No 100/03

UKAB Note (2): The UK AIP at ENR 5-5-1-1 promulgates Chipping as a Glider Launching Site centred 535301N 0023714W for winch launches where cables may be encountered to 3000ft agl, during daylight hours; site elevation 600ft. amsl.

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.

Members were dismayed that the EC135T pilot had used a GPS track without adequately monitoring his progress subsequently by use of a map. This course of action had led him to overfly an active promulgated glider site below cable launch height, which could have resulted in a potentially serious incident, but had ultimately caused the Airprox. The ASK13 pilot was concerned to see the helicopter without warning just 100m on her R, in conflict and apparently without seeing her ac.

Without knowing the EC135T pilot's intentions, she had altered course to the L before regaining her D/W track and slowed her ac whilst she watched the helicopter overtake her, as it overflew the landing area, before it turned L to clear her intended track. Meanwhile the EC135T pilot had noticed the glider late, 500m away and had altered course slightly to the R and passed, he reported 400m away, whilst maintaining visual contact. Fortunately there had not been a winch launch in progress at the time and no other cct activity. The mutual sightings and subsequent actions taken by both parties were enough to persuade the Board that any risk of collision had been effectively removed.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The EC135T pilot flew overhead an active promulgated glider site below cable launch height and close enough to cause concern to the ASK13 pilot.

Degree of Risk: C.

AIRPROX REPORT NO 101/03

Date/Time: 6 Jul 1807 (Sunday)

Position: 5226N 0120W (6.5nm NE Coventry - elev 281 ft)

Airspace: London FIR (Class: G)

<u>Reporting Ac</u>	<u>Reported Ac 1</u>	<u>Reported Ac 2</u>
---------------------	----------------------	----------------------

<u>Type:</u> Learjet 45	Eurostar (1)	Eurostar (2)
-------------------------	--------------	--------------

<u>Operator:</u> Civ Comm	Civ Pte	Civ Pte
---------------------------	---------	---------

<u>Alt/FL:</u> 2000ft QNH 1021	1500ft QNH	2700ft QNH
--------------------------------	------------	------------

<u>Weather</u> VMC CAVOK	VMC Below	VMC
--------------------------	-----------	-----

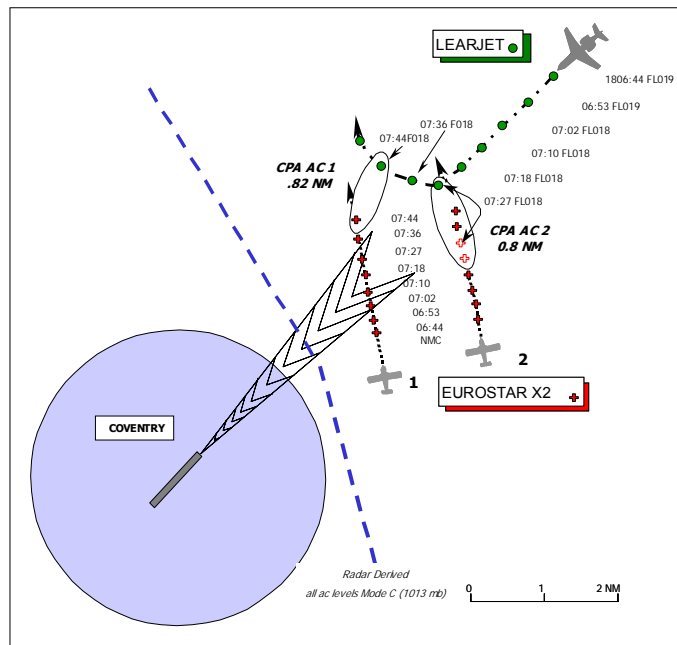
<u>Visibility:</u> NR	10km	10km
-----------------------	------	------

Reported Separation:

100ft V 200ft H	500ft V 2nm H	0ft V 1nm H
-----------------	---------------	-------------

Recorded Separation:

Learjet v Eurostar 1	.85nm
Learjet v Eurostar 2	.8 nm



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE LEARJET 45 PILOT reports flying a white and blue ac on an IFR flight from Neveres (France) to Coventry squawking with Mode C as directed. While heading 231° at 160kt and level at an Alt of 2000ft on the QNH with 6nm to run on an ILS approach to Coventry RW23, he was given an avoiding action right turn on to 320° by Coventry APR due to a faint pop-up radar contact. He continued following radar headings until the conflict was cleared. He assessed the risk of collision as high.

THE PILOT of EUROSTAR (1) reports flying a silver ultralight ac with no transponder or lights fitted at 1500ft on the QNH and heading N at 85kt from Long Marston to Sittles Farm near Lichfield, in receipt of a RIS from Coventry APP on 119.25. He saw a white Learjet in his right 1:30, 500ft above, in a

AIRPROX REPORT No 101/03

climbing turn to the right, at a range of 2nm. He did not take any avoiding action as he considered that none was required and assessed the risk of collision as low.

THE PILOT of EUROSTAR (2) reports that his ac had no transponder, lights or radio fitted. He was heading 300° at 90kt and 2700ft on the QNH ½nm E of CT LCTR when he saw a white Learjet in his 1 o'clock crossing from right to left at 1nm at about the same height but descending towards Coventry and he thought the pilot probably had not seen him. Some time later the Learjet orbited to the right presumably to avoid a Jodel (*actually Eurostar (1)*) flying to his left. He assessed the risk as 'none' and took no avoiding action as he considered that none was required.

UKAB Note (1): Both Eurostar ultralight ac had departed from Long Marston and were transiting VFR to Sittles Farm. It is probable, from the pilots' reports available, that they were not in company but flying independently of one another; however both had each other in sight. The pilot of Eurostar (2) probably misidentified the other Eurostar as a Jodel which is similar in appearance.

COVENTRY APR reports that a Learjet was being vectored for an ILS approach to RW23, to intercept the localiser at a range of 7nm at an Alt of 2000ft. When the ac was at 5.5nm an unidentified weak primary radar contact was seen crossing the final approach track at 3nm. He passed TI and subsequently gave avoiding action right on to 320° and the pilot reported no TCAS information. Subsequent tracing action on known transiting ac gave information on another ac, which was non-radio known to be in the vicinity at the time of the incident.

UKAB Note (2): From the timings of the 2 consecutive right turn instructions given by Coventry APR, recorded on the RT transcript, and the Learjet's corresponding right turn(s) seen on the Clee Hill radar recording commencing a few seconds later, it is probable that the avoiding action was given as against Eurostar (1), (the westerly ac). The ac observed and reported in the Airprox by the Learjet pilot was, however, the easterly ac (Eurostar (2)), which was not initially seen by Coventry APR, although it shows on the recording of the Clee Hill radar and was reported to the Learjet pilot in a subsequent transmission. Both radar primary returns were reported as weak, which would be consistent with the small size of Eurostar ac.

UKAB Note (3): The transcript of the APR frequency reveals the following just after 1808½:

'XXX We got nothing on TCAS and then we got him a hundred feet when he turned above us'.

UKAB Note (4): Due to initial confusion with the identity of the ultralight(s), it was not realised until some time later that one of the pilots concerned was in communication with Coventry ATC. Consequently, no interview with the Controller(s) was conducted at the time of the incident and no transcript of the TWR frequency was possible. However, an RTF copy cassette was available, upon which the ATSI report is based.

ATSI reports that at the time of the Airprox, the Learjet was being vectored, by the Coventry APR, to RW 23 ILS, whilst the ADC (Tower Controller) was providing the pilot of Eurostar (1) with a FIS. The Learjet pilot was operating under IFR and Eurostar (1) under VFR. The UK AIP Page AD 2-EGBE-1-6 promulgates the hours of Coventry Radar for Sundays, in the summer period as, 'on request, 0830-1600'. However, it is standard practice to provide a radar service, outside these hours, to IFR inbounds, providing a radar controller is available. On this occasion, the APR Controller was in position at 1757 to provide a radar service, not only to the Learjet, but also to a Citation inbound IFR ahead of it.

The pilot of Eurostar (1) contacted Coventry TWR at 1801 reporting travelling Northbound, between Draycott Water and 'your runway', at 1400ft on 1016mb and confirmed his position as about 4nm S of the airport. Shortly afterwards, the pilot of an inbound Citation established communication with the ADC; by this time he was carrying out a visual approach to RW 23, having been advised of unknown traffic crossing through the approach path northbound. For about the next 2min the ADC was occupied, not

only with the Citation, but also with a light ac which had to orbit downwind to fit in behind it. In the event, the Citation broke off the approach because of the unknown traffic. During this period information was passed to the pilot of Eurostar (1) about the traffic orbiting downwind. At 1804 the Eurostar pilot reported W of Church Lawford and 2min later overhead the 'racetrack' (about 3nm E of the airport), heading for Sittles Farm, Lichfield. The radar photograph timed at 1806:09, shows 2 primary returns tracking N, to the E of Coventry Airport. The westerly one, just outside the ATZ about 3nm E of the airport, is believed to be Eurostar (1) (based on subsequent pilots' reports). The Learjet is about 6.5nm to its NE, having reported on the APR frequency that he was established on the Localiser for RW 23. Shortly afterwards APR asked ADC via intercom, if the unknown ac which had conflicted with the Citation, had called on his frequency. During the communication the latter controller was first made aware of the position of the Learjet, which he said was on a 6nm final at 3000ft. It was at this point that the ADC informed the APR that the traffic (he thought the westerly one) that was just about to go through the final approach track at 1400ft was working him.

Having been informed of the traffic at 1400ft (Eurostar (1)), APR asked the Learjet pilot for his level; the pilot replied *'at two thousand XXX'* and was informed of traffic *'just going through your twelve o'clock range of one mile at fourteen hundred feet'*. In the same transmission APR instructed the Learjet pilot to *'turn right right head three two zero avoiding action'*. On receiving an acknowledgement from the pilot, the TI was updated as *'South of you by half a mile now on a converging heading height unknown'*. The pilot reported visual with the traffic, whereupon he was advised that he could continue the approach at his discretion although there was *'further traffic, twelve o'clock range one mile parallel track to that one'*. The pilot elected to take headings and was repositioned for the ILS clear of the traffic.

Meanwhile, the ADC passed TI to the pilot of Eurostar (1) about the Learjet on final at 6nm RW 23 and the pilot reported the traffic in sight *'just banking round'*.

Radar photographs of the event show the Learjet making the right turn in reaction to the avoiding action instruction, with the Easterly of the two primary returns in its 8 o'clock at 0.8nm and the other, believed to be Eurostar (1), in its 10 o'clock 1.1nm. This distance closes to 0.85nm as the Learjet passes ahead in its right turn.

As a result of a previous incident, involving ambiguity in the provision of radar services at Coventry, a Supplementary Instruction was issued locally to clarify the situation (SI 09/02). This is still applicable and states that: "Whenever an approach radar service is provided at Coventry, the Approach Control and Approach Radar functions will be combined, as specified in MATS part2 section 4, chapter1, para.3. *This applies at all times*; when utilising frequency 122.0MHz (i.e. when Aerodrome and Approach Control are *promulgated* as a combined function on 119.25MHz) or on frequency 119.25MHz when the aerodrome function is separated onto frequency 124.8MHz. Account of *all* traffic that is likely to conflict with that receiving an approach radar service is to be made." The Eurostar called on the promulgated Approach frequency i.e.119.25MHz but was not transferred to the APR (Radar) frequency (122.0MHz), in accordance with the SI. Consequently, the APR Controller was unaware that an ac would be routing through the final approach path of RW 23, in contact with Coventry ATC. It is understood that the reason for not transferring the ac was that the APR frequency was only going to be used for a short time, during the arrival of the two IFR inbounds (in the event 14 min). It is considered that, although not condoning this action, the ADC Controller should at least have offered the APR Controller the choice of working the overflying traffic or informed him of its routing and Alt, knowing that IFR arrivals were imminent. Conversely, the Coventry MATS Part 2 requires that the ADC Controller is to be advised when any inbound ac is approximately 15nm (or 5 minutes flying time) from the airfield, together with the type of approach. Additionally, for IFR inbounds, the APR Controller will give the ADC Controller a range check at 10nm, unless transfer of control has been effected. These requirements were not met on this occasion. Had either Controller complied with their respective responsibilities, the potential for a conflict between the subject ac could have been recognised, allowing appropriate action to be taken

AIRPROX REPORT No 101/03

at an earlier stage to resolve the situation. Although no mention was made on the frequency concerning the type of service being provided to the Learjet, APR confirmed his intention of providing a RAS. He commented in his report, that a weak primary return was only seen on his radar display, as it crossed the final approach track at 3nm, when TI and an avoiding action turn was issued to the Learjet.

UKAB Note (5): Coventry APR does not have SSR and the radar recordings of the event used by ATSI were taken from a source not available to Coventry ATC.

UKAB Note (6): The recording of the Clee Hill radar shows the CPA of the Learjet and Eurostar (2) as being 0.8nm. Since the Learjet pilot reported a vertical separation of 100ft and the Eurostar pilot 0ft, it is likely that the ac were at approximately the same Alt of 2000ft with minimal vertical separation. The horizontal separation between the Learjet and Eurostar (1), from which he was probably unsuspected due to the right turn, was a minimum of 0.85nm before increasing rapidly. The Eurostar (1) pilot's reported separation of 2nm could have been reasonably accurate depending on when he first saw the other ac. Since no confirmatory information is available and the pilot of Eurostar (1) reported that he was at 1500ft and while the radar replay shows that the Learjet was at 2000ft, it can be assumed that the Eurostar (1) pilot's reported vertical separation of 500ft is reasonably accurate.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac, transcripts of the APR RT frequency, radar photographs/video recordings, reports from the air traffic controllers involved and reports from the appropriate ATC authorities. Despite this however, there were still elements of doubt as to the facts surrounding the ATC aspects of this incident. While it was evident that the APR Controller eventually saw both Eurostars it was not clear when the respective Eurostars painted on his radar. Neither was it clear which ac was seen when by APR or which Eurostar caused him to give avoiding action to the Learjet.

Since no transcripts of the Tower/Approach frequency or land lines were available and no specific mention is made in the report submitted by the pilot of Eurostar (1), Members were uncertain as to whether the ADC had been aware of the existence of Eurostar (2) and requested a further detailed check of the available information. The post incident report submitted by the ADC was not included in Part A above but for completeness is now reproduced.

COVENTRY ADC reported that he was working an ac routeing from Long Marston to Lichfield which was flying at 1400ft on the QNH of 1021, transiting from S to N through the RW23 final approach path at approx 3nm ahead of the inbound Learjet. He gave TI to the pilot of Eurostar (1) on the Learjet who confirmed that he had the Learjet in sight. The ADC noticed another return on the ATM beyond that of Eurostar (1) so he asked the pilot if he knew what it might be. Eurostar (1) pilot replied that he was not certain but thought it might be another Eurostar from the same point of departure. The ADC passed this information to APR who gave avoiding action to the Learjet.

This report confirms that both controllers had been aware of the existence of both ac, albeit it seems that the first indication of the existence of Eurostar (2) to the Radar Controller came when the ADC warned him about it.

The Board was disappointed to note that this incident was very similar to a previous Airprox at Coventry following which ATC procedures (SI 09/02) were put in place to prevent a recurrence; however, these procedures, which are still in force, were not adhered to by ATC staff. The chain of events leading to this incident could have been broken by the ADC requesting a range check of the inbound IFR traffic of which he was aware apparently only from his ATM, or by him notifying APR earlier of the VFR traffic crossing through the ILS flight path, one of which he was working, and the other of whose position, but

not alt, he was aware. Further, had the APR notified the ADC that the IFR traffic was inbound and established on the ILS, this would probably have prompted the latter to mention the VFR transiting ac.

Turning to the actions of the 3 pilots involved, the Board determined that the actions of the Learjet pilot did not in any way contribute to the incident.

Although not under any regulatory requirement to do so, the pilot of Eurostar 1 displayed good Airmanship by contacting Coventry APP, on the promulgated frequency, in good time and passing his intentions followed by easily understandable and accurate position reports; these should have been sufficient for Coventry ATC to monitor his slow progress round their ATZ. It would seem, from the limited information available, that the pilot of Eurostar 2 attempted to give Coventry a wider berth both laterally and vertically. GA specialist members observed however, that flying VFR through a known ILS glidepath might restrict options for controllers and approaching ac.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A conflict in Class G Airspace on the ILS approach to Coventry.

Contributory Factors: Coventry ATC did not comply with SI 09/02.

Degree of Risk: C.

AIRPROX REPORT No 102/03

AIRPROX REPORT NO 102/03

Date/Time: 11 Jul 1429

Position: 5203N 0406W (1½ nm SSW of Lampeter mast - Wales)

Airspace: UKDLFS - LFA7 (Class: G)

Reporting Ac Reported Ac

Type: Sea Harrier FA2 Hawk

Operator: HQ STC HQ PTC

Alt/FL: 250ft 350ft
(Rad Alt) (agl)

Weather VMC CLOC VMC CLOC

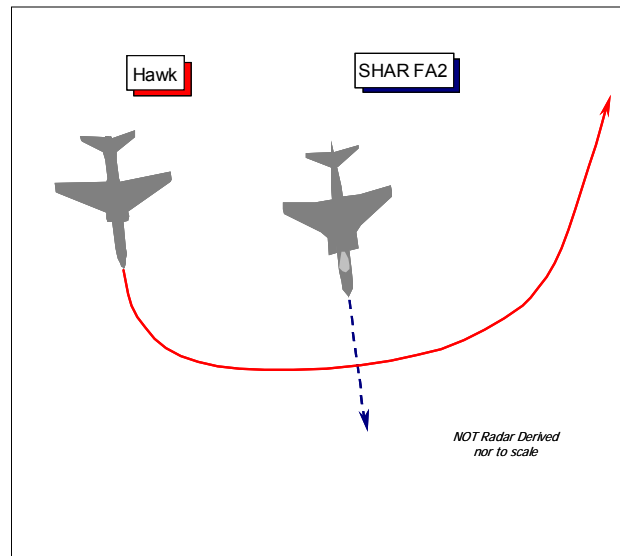
Visibility: +10km +30km

Reported Separation:

300ft H, 100ft V 150m H, 500ft V

Recorded Separation:

NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE SEA HARRIER FA2 (SHAR) PILOT, a student pilot, provided a very comprehensive account reporting that he was flying a solo low-level navigation exercise through LFA7, whilst listening out on the LFS frequency of 300.8MHz and squawking A7001 with Mode C. Neither TCAS nor any other form of CWS is fitted, but his ac's radar was selected 'on'; the ac has a grey camouflage scheme but HISLs are not fitted.

He was flying about 4000ft below cloud in good visibility of >10km and was aware that the low level section of the sortie would be busy, thus he was maintaining an "active lookout" assisted by his ac's AI radar; his workload at the time of the Airprox was increasing in the lead up to the target run, but his lookout may have been degraded slightly. Just before he commenced the target run, in the vicinity of Lampeter mast heading 172° at 420 kt flying straight and level at 250ft (RadAlt), he suddenly spotted the black Hawk ac "very late" crossing ahead of his jet from W - E 300ft away in a L turn. The Hawk had a high crossing rate presenting a plan form view to him, which did not allow any time for avoiding action to be taken as the Hawk passed 100ft above and 300ft ahead of his SHAR with a "medium/high" risk of a collision.

Following the encounter he "waggled his wings" to warn the other pilot of his presence if he had not been seen and in case the Hawk pilot also had a wingman, but he lost sight of the Hawk after the occurrence. He added that the location of the Airprox is a well-known and frequently used turning point for fast jets, but he thought that the Hawk crew might have been unaware of the proximity of his SHAR ac.

THE HAWK PILOT a QFI, reports he was instructing a student during a low-level introduction sortie in LFA7 whilst listening out on the LFS frequency of 300.8MHz and squawking A7001 with Mode C. Neither TCAS nor any other form of CWS is fitted, his ac has a black colour scheme and the HISL was on.

Whilst teaching his student the importance of effective lookout, they spotted the SHAR at a range in excess of 10km. After quickly establishing that it was not part of a formation he took the opportunity to conform to good instructional practice and use the event to illustrate several points of airmanship. Turning to close with the SHAR he was able to elicit from his student what their maximum speed could be and upon which side they should overtake the other ac. As they approached the SHAR, flying a

parallel course heading 135° at 450kt, but offset 500yd to starboard, he was able to demonstrate the importance of understanding and applying the 'Rules of the Air'. He demonstrated how to ensure that the SHAR pilot could maintain his 'right of way' and freedom to manoeuvre and the importance of avoiding startling or annoying the other pilot. In particular, he demonstrated that the other pilot clearly had not seen them as he gradually came alongside the SHAR maintaining 500yd separation to starboard of the other jet still unseen. He then executed a 4G pull up and cleared to the left in order to keep the other ac in view, passing 150m ahead of and 500ft above the SHAR. He opined that there was "*no danger of collision throughout the encounter*", since he was "*looking out*" for both ac.

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

THE SEA HARRIER PILOT'S STATION comments that this Airprox occurred in the UKDLFS -Class G airspace - between two ac operating under VFR. The SHAR pilot was clearly shaken by the encounter and was concerned at the proximity of the Hawk as it crossed at an acute angle. The pilot's frank report indicated that his high cockpit workload whilst running in on the target possibly contributed to his reduced lookout and very late sighting of the Hawk. The SHAR pilot's decision to file an Airprox was correct as he felt the safety of his ac had been compromised and he was keen to highlight the risks to other fast jet operators. It is hoped that the usefulness of the Airprox system, in identifying possible lessons learnt, is equally valued by all parties involved. This occurrence highlights the need to avoid known low-flying turning points to minimise the likelihood of a confliction - squadrons at this unit have been debriefed accordingly.

THE HAWK PILOT'S UNIT comments that the Hawk pilot's report – from a very experienced pilot and instructor – make it clear that at no time was there any risk of a collision. It would appear that the SHAR pilot was somewhat taken aback by the unexpected appearance of the Hawk, but on the evidence available it would not appear that an Airprox was appropriate.

HQ STC comments that at first glance the description bears a startling resemblance to a Target Of Opportunity (TOO) attack profile only allowed by 1Gp ac. However, the Hawk QFI's description precludes this as a possibility. The fact that the Hawk pilot did indeed 'startle and annoy' the other pilot in the SHAR showed that his actions were misguided. What is apparent is that there was a minimal risk of collision as the Hawk pilot had recognised his responsibility to remain clear of the SHAR. However, he pressed too close, and manoeuvred too aggressively, to safely demonstrate the importance of understanding and applying the 'Rules of the Air'.

HQ PTC comments that this encounter is signally different as seen from each cockpit. The Hawk QFI, who was in control of the situation throughout, carried out what probably seemed like a good idea at the time - the opportunity to teach the handling of random encounters at low-level. Had it been terminated by inching into the Sea Harrier pilot's view, a wing waggle to attract attention and then a smooth level breakaway then: "lesson learned". But a sudden pull-up over the top while this "OCU student" could have been about to pop up for a SAP was not well thought-out and spoiled an otherwise good teaching-point. The SHAR pilot, however, was taken unawares by the Hawk manoeuvre and was, not unnaturally, concerned by the sudden and close appearance of another ac. Whilst the risk of collision was minimal, there are clear airmanship lessons to be learnt from this incident.

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.

Members thought that the Hawk QFI Unit's comment that "*...it would not appear that an Airprox was appropriate*", was questionable. In the Board's view, it was entirely reasonable for the SHAR pilot to report this occurrence through the Airprox 'System', since he felt his safety had been compromised.

AIRPROX REPORT No 102/03

Fast jet pilot members with considerable instructional experience were extremely dubious of the wisdom of the Hawk QFI's decision to close to such distances to teach points of airmanship as explained. In the Board's view the events described here were the very antithesis of good airmanship and professional practice. Although the complete geometry of the encounter had not been explained at length, the Hawk QFI's reported acquisition range of 10km and speed of 450kt did not jibe with this alleged overtaking situation. Rudimentary calculations showed that at the reported 30kt overtaking speed, to overtake the SHAR flying at 420kt would require in excess of 10min from 10km away (5.399nm). Thus the Hawk pilot might have been flying faster than he thought or had acquired the other jet at a shorter range. The PTC member opined that it was unfortunate that this evolution had gone slightly awry at the last minute. However, some fast jet pilot members thought this was an extremely unprofessional example to set an impressionable student. Whereas approaching wide on the SHAR's starboard beam and then breaking away to starboard might have been acceptable, overtaking and turning toward the other ac to cross 100-150m ahead in an un-coordinated manoeuvre was, in the Board's view, very unwise. Unbeknown to the Hawk pilot, the student SHAR pilot was approaching his target run. A pop-up by the SHAR at the time the Hawk QFI pulled up across the SHAR's track might have had a very serious outcome. Fortunately, for all concerned the SHAR student did not climb at the critical moment and the QFI said he had ensured that 500ft of vertical separation had existed when he crossed ahead of the other jet. This was at variance with the SHAR student pilot's report of 100ft, but without recorded radar data the vertical separation that pertained could not be independently ascertained; nevertheless in the situation described here it was apparently too close. It was clear that this encounter in the LFS had been a premeditated manoeuvre instigated by the Hawk QFI, the outcome of which was solely in his hands. In the Board's view, this Airprox had resulted because the Hawk pilot flew deliberately and unnecessarily close across the track of the SHAR.

In their assessment of the risk inherent here, the Board could only consider what actually did occur. Although this situation had all the potential to develop into something much more serious, fortunately, it did not. The Hawk QFI had opined that he had been looking out for both ac, so he would have been able to increase the separation and pull away in his nimble jet at will. The Board could only conclude, therefore, that although the Hawk QFI's actions might have been unwise, no risk of a collision was apparent during this encounter in the LFS.

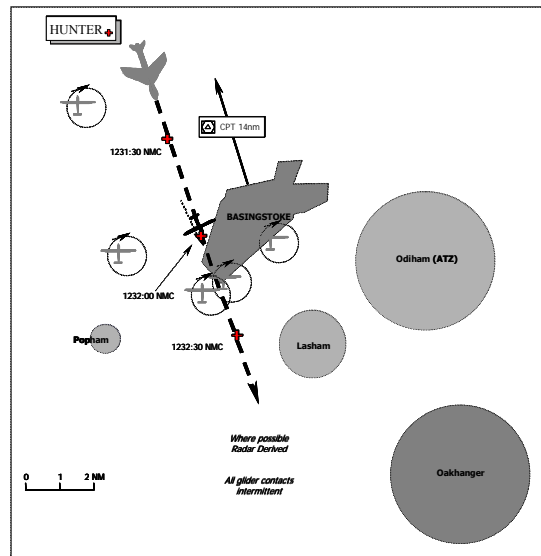
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Hawk pilot flew deliberately and unnecessarily close across the track of the SHAR.

Degree of Risk: C.

AIRPROX REPORT NO 103/03

Date/Time: 12 Jul 1231 (Saturday)
Position: 5118N 0108 W (1nm N of Basingstoke)
Airspace: London FIR (Class: G)
Reporting Ac Reported Ac
Type: DG300 Glider Hunter T7
Operator: Civ Pte Civ Comm
Alt/FL: 3800ft QNH NR
Weather VMC VMC
 NIL CLOUD
Visibility: 30nm >10km
Reported Separation:
 10/20ftV 100mH NR
Recorded Separation:
 Not positively determined.

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

THE GLIDER PILOT reports heading 170° at 55kt about 1nm N of Basingstoke, listening out on the general gliding frequency, when he heard a very loud noise, which he initially thought, was caused by a major part of the ac falling off. He then saw the tail pipe of a dark coloured Hunter after it had overtaken him 100m to his left, at about the same height, and going at high speed on a similar heading. Since Lasham was very busy at the time and he had been thermalling up to about a minute before, he had been maintaining a good lookout but he still did not see the Hunter prior to its passing him. He did not take any avoiding action since the Hunter had overtaken him, but assessed the risk of collision had been very high.

He reported that he also flies a C152 but always avoids Lasham by a good margin since it is frequently very busy.

THE HUNTER T7 PILOT reports that he was flying in good VMC from Kemble heading S, and was in receipt of 'tactical vectors' from Farnborough on 125.25. Although there were many gliders in the vicinity he did not see the reporting ac.

UKAB Note (1): Despite the Hunter operator being located and contacted within a few days of the event, the pilot did not submit a report until over 3 months later. Consequently it contained little information of value in the reconstruction of the event.

THE FARNBOROUGH RADAR CONTROLLER reports that at 1330 Glider 405 called on 125.25 to report an Airprox that had occurred an hour earlier in the vicinity of Basingstoke with a Hunter heading S. A check of the flight strips showed that Farnborough Radar had not worked a Hunter in the time period reported. She believed that the Hunter concerned must have been one, which was en route to an air display at Goodwood; Goodwood ATC subsequently confirmed that a Hunter flew a display there at about 1240 and that it was from Kemble.

The Farnborough local ATC investigation verified the Controller's report.

UKAB Note (2): The Farnborough RT recording/transcript shows no record of the subject Hunter having contacted them before or after the reported time of the incident.

AIRPROX REPORT No 103/03

UKAB Note (3): The base of the London TMA at the reported position is FL55 decreasing to FL50 just to the N.

UKAB Note (4): The Heathrow radar recording shows the Hunter heading from N to S to the W of Odiham at 360kt through an area of high traffic density with at least 5 intermittent contacts, presumably gliders. The contact was originally squawking 3703 (Brize Norton) indicating FL40 but the transponder was switched to standby, last showing FL40 just over a minute before the incident; therefore the Hunter's altitude cannot be positively determined. It is reasonable to assume however, that it remains below the base of the TMA at FL50 and that the gliders are at a similar height. The Hunter primary contact passes close to, and directly between, 2 other intermittent primary contacts circling about 1nm to the S of the reported position (i.e. over the NW edge of Basingstoke) and separated laterally by about 500m from each. Since the reporting pilot stated that he had stopped thermalling 1min prior to the incident, then headed in a S direction and also reported the miss-distance as well under 500m, it has not been possible to resolve the geometry of the incident with any degree of certainty. It is quite possible however, that neither contact was his ac and that he was further to the N, in the reported position, but not painting on radar, and that the miss-distance was as he reported.

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 expressed disappointment that, despite being contacted in good time, the Hunter pilot did not provide a report until 3 months after the event when his recollection of events would no longer have been clear, as witnessed by his stating that he was in receipt of a service from Farnborough when no evidence of this can be found on the recordings of the RT. They therefore considered that the glider pilot's recall of the events would probably be more accurate than the Hunter pilot's and they weighted the information used in their deliberations accordingly.

Members thought the Hunter pilot's plan to route at 360kt, close to Lasham through an area of known heavy glider activity with an artificial ceiling imposed by the London TMA, at a weekend in ideal weather conditions for gliding, at best unwise. They discussed the effect of the ac's speed and lack of a radar service (required by his exemption to the maximum of 250kt VFR below FL100 rule in the ANO Rule 23) but agreed that it had not contributed to the outcome of this incident. The glider had not painted on radar and, even given 50% more time to acquire it visually, due to the tail-on aspect of the glider, it was still unlikely that he would have seen it. White gliders co-altitude into sun in a head or tail-on aspect against a sky background are particularly difficult to acquire visually and it is generally safer to avoid areas where they are known to operate.

A majority of Board Members however, considered that since the Hunter pilot had overtaken the glider with almost no vertical separation and inside 100m laterally, without seeing it, it was only by chance that they had not collided. They therefore concluded that there had been an actual risk of their colliding.

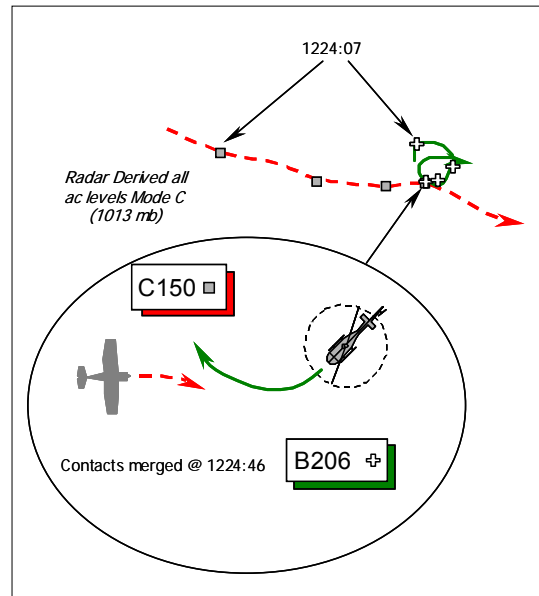
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Hunter pilot overtook the glider without seeing it.

Degree of Risk: A.

AIRPROX REPORT NO 104/03

Date/Time: 6 Jul 1224 (Sunday)
Position: 5231N 0043W (Rockingham Race Circuit, Nr Corby elev - 328ft)
Airspace: London FIR (Class: G)
Reporting Ac Reported Ac
Type: B206 JetRanger Cessna 150
Operator: Civ Comm Civ Club
Alt/FL: 2500ft 3100ft
 (QFE 1010mb) (QNH 1021mb)
Weather VMC CLBC VMC CLBC
Visibility: 45km 10km
Reported Separation:
 75m H/100ft V 500ft V
Recorded Separation:
 Contacts merged

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

THE B206 JETRANGER PILOT reports his helicopter has a silver & black colour scheme, but did not state if a HISL was fitted. A squawk of A7000 was selected with Mode C and a Skywatch CWS was fitted. He was tasked with the re-broadcast of a race meeting at Rockingham racetrack N of Corby this Sunday afternoon and was in receipt of a FIS from Northampton/Sywell on 122.7MHz, whilst operating VFR some 2000ft below cloud in excellent visibility flying out of sun. This evolution had been promulgated to other airspace users by NOTAM.

Flying a slow but tight right hand orbit at 20kt, passing 340° at 2500ft QFE (1010mb), he was visually tracking a sailplane about ¼nm to the N of his position when his passenger drew his attention to a single engine high wing monoplane [a C150] which he spotted 500m away flying towards them slightly below his helicopter. Skywatch had not provided a warning; to avoid the other ac, he reports he turned left and climbed, as the aeroplane passed 75m away down the *starboard* side, and about 100ft below his helicopter without any sign of avoiding action being taken by the other pilot during the encounter. He provided the ac registration within his report, adding that the risk was “*medium/high*” and he believed that the other pilot was consulting a map at the time of the Airprox.

[UKAB NOTE: (1): AIS Central NOTAM Office advises that a NOTAM was issued for the activity undertaken by the JetRanger pilot. NOTAM H4152/03 promulgated, that, at “EGHO” – [erroneously suggesting that Thrupton aerodrome was the site of the activity] during the period 0845–1615 UTC on 06 Jul, “*Helicopter filming and camera rebroadcasting activity*” would take place within 2nm radius of a position “5231N 00043W (ROCKINGHAM CIRCUIT, NORTHAMPTONSHIRE)”, extending from the surface to 3500ft agl. The information transmitted from AUS to AIS Heathrow had included the Thrupton aerodrome ICAO location indicator and this was included erroneously in the NOTAM, but not detected by either AUS, AIS or indeed Thrupton or the JetRanger pilot, prior to this occurrence. Manager AUS advised that a typing error resulted in the incorrect ICAO indicator being included in the NOTAM, nevertheless, he contended that the narrative text included should have made the location plain.]

THE CESSNA 150 PILOT reports his aeroplane has a red & white colour scheme and the anti-collision beacon was on; a squawk of A7000 was selected but Mode C is not fitted. Whilst in transit from Leicester to Elmsett [UKAB Note (2): a direct track between these two aerodromes passes over

AIRPROX REPORT No 104/03

Rockingham Circuit] he had tried to call Wyton APPROACH but they did not respond so he was not in receipt of an ATIS during the Airprox. Flying at 3100ft QNH (1021mb), heading 115° at 83kt he spotted the JetRanger helicopter about 7nm away and had been watching it for a period he estimated of about 5min. It appeared to him that the JetRanger was in a stationary hover, with its nose pointing towards the Rockingham racetrack and he was content that his ac's track would take him clear down the helicopter's starboard side and some 500ft above it. He reasoned that as he was approaching the JetRanger from its right hand side, its pilot in the P1 position would spot his aeroplane (assuming that he was keeping a good lookout), so he maintained his course and speed as *"was required by the Rules of the Air"*.

Approaching the JetRanger on a steady course in level cruise, he kept a keen lookout whilst reviewing his initial decision in case he might need to take avoiding action. He was then surprised to see the JetRanger turn sharply right, initially towards his aeroplane as it passed about 400m to *port* he reports and 500ft above his C150, before turning L onto a parallel course behind him. No avoiding action was taken as he was on the right and he was not sure which direction the helicopter pilot might take. At that time he concluded that the helicopter pilot had not seen his aeroplane approaching for the same amount of time that he had been in visual contact with the JetRanger. The risk was assessed as *"low"* initially but he believed it changed to *"high"* when the helicopter moved.

[UKAB NOTE: (3): In a further telephone conversation with the C150 pilot he explained that he had checked the NOTAMs before he had departed from Elmsett earlier that day. A copy of the UK Daily Navigation Warning summary had been reviewed, but the warning for the JetRangers activity had not been apparent to him, but not as a result of the NOTAM error highlighted here. He also checked them again before he left Leicester.]

[UKAB NOTE: (4): It is difficult to resolve the differing perceptions of the relative geometry of this encounter due to the very tight right hand orbit conducted by the helicopter at slow speed; no Mode C is evident at all on the Debden radar recording although the pilot reports the ac is fitted with altitude reporting. Furthermore, the altitudes reported do not jibe with the helicopter passing above the C150, upon which both pilots' reports agree. The reported The C150 is shown approaching the area on a steady course squawking A7000 [no Mode C fitted] as the helicopter turns R at 1224:07. The C150 closes from the W as the B206 continues in the R turn through S, but the aeroplane executes a slight L turn toward the helicopter and the contacts merge in azimuth shortly thereafter, at 1224:46. The JetRanger pilot's avoiding action L turn is not evident and the helicopter appears from the radar recording to continue the R turn onto E as the C150 turns slightly R and opens to the ESE. The JetRanger then recommenced the orbit.]

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board expressed concern over the published NOTAM error revealed during the course of this investigation. Whilst uncomplicated mistakes such as occurred here cannot be eradicated entirely, this NOTAM had passed through several agencies that had not detected the error. Surprisingly, neither had the JetRanger pilot nor his company's operations department, but clearly they had done their best to ensure that the unusual activity had been promulgated to other airspace users. Nevertheless, several members thought that the simple inclusion of the coded location indicator *"EGHO"* in a NOTAM which clearly referred in the text to an activity at *"5231N 00043W (ROCKINGHAM CIRCUIT, NORTHAMPTONSHIRE)"*, was not necessarily significant unless the C150 pilot had utilised the AIS NOTAM website. The commendably frank and honest account provided by the C150 pilot had made it clear that he had not availed himself of this facility, but the UK Daily Navigation Warning Summary had been available to him at his local aerodrome, that he had referred to before departure and thus he should have been forewarned. This oversight in not carefully checking warnings was avoidable and a GA

member observed that it had revealed some disappointing inadequacies in the C150 pilot's pre-flight planning. The lesson here for all pilots was – check ALL available aeronautical information very carefully - NOTAMS especially - as 'forewarned is forearmed'. However, the NOTAM warning other pilots of the activity did not accord the JetRanger pilot any exclusive use of this airspace, nor absolve him or the C150 pilot from their obligations under the 'Rules of the Air'. A pilot member suggested there was an obligation under the ANO, on the part of the C150 pilot, to avoid overflight of the race circuit where he should have expected more than 1000 persons to be assembled. However, this was a solitary view and others contended this was an unreasonable expectation; the Board agreed that the NOTAM error was not a fundamental factor within this encounter in the Open FIR, where 'see and avoid' predominates.

Ignorant about the promulgated warning, the C150 pilot was not specifically looking for the JetRanger after he had departed Leicester. Nevertheless, he had spotted the helicopter at a reasonable distance some 7nm away and had watched it closely as he flew towards Rockingham but took no avoiding action at all. From the other cockpit, the JetRanger pilot whose task necessitated a slow speed and tight turns in the hover, remaining in close proximity to the race circuit, had not seen the other aeroplane before his passenger spotted it and drew his attention to it. It would have been impossible to see the light ac when it was astern of his helicopter, but it should have been plainly in view during preceding orbits. Evidently, the approach of the C150 had defeated 'Skywatch', which had unfortunately not presaged the encounter and members also noted the absence of the helicopter's Mode C. Thus the JetRanger pilot was unaware of the C150 until it had flown into close quarters apparently to starboard, whereupon he turned L away from it as the aeroplane passed 75m and some 100ft below him. Conversely, the C150 pilot thought erroneously, that the helicopter was in a stationary hover and he was always approaching from its starboard side. This was not the case as the JetRanger turned R, but this was unknown to the C150 pilot at the time. Since the geometry was continually changing as the helicopter turned R, strict compliance with the requirements of the 'rules' was made doubly difficult. In this scenario, it would have been far better to give the helicopter a wider berth from the outset and the GA pilot member echoed the concern of pilot members, who were disappointed that having spotted the helicopter at 7nm and watched it throughout, the C150 pilot still flew into unnecessarily close quarters with the helicopter. Here was another salutary lesson – never assume that the other pilot has spotted your ac because the 'rules' will not help you if he has not seen you – so always be prepared to take positive action at an early stage to avert an awkward close quarters situation. In the Board's view, this entirely avoidable encounter had resulted because the C150 pilot had flown into conflict with the JetRanger.

Although the Cessna pilot had reported 500ft vertical separation at the time, this was at variance with the 100ft reported by the JetRanger pilot. Mode C data from both ac was not available and so this anomaly could not be resolved, but members thought it unlikely that the helicopter pilot would have reported the event unless he believed the C150 had passed inordinately close. The radar recording did not reflect the lateral geometry reported, but at such a short range this was not surprising. A left turn as reported by the B206 pilot apparently toward the aeroplane seemed inconceivable in the circumstances and in view of the helicopter pilot's late sighting and robust avoiding action, some members suggested that safety had not been assured. Nonetheless the helicopter pilot had turned away (possibly to the R) from the C150 and others contended that however late the avoiding action was taken, even at the closest point when the contacts merged, apparently a minimum of 100ft vertical separation had existed. Though not a unanimous decision this latter view prevailed and the Board concluded that no risk of a collision had existed in the circumstances reported here.

PART C: ASSESSMENT OF CAUSE AND RISK

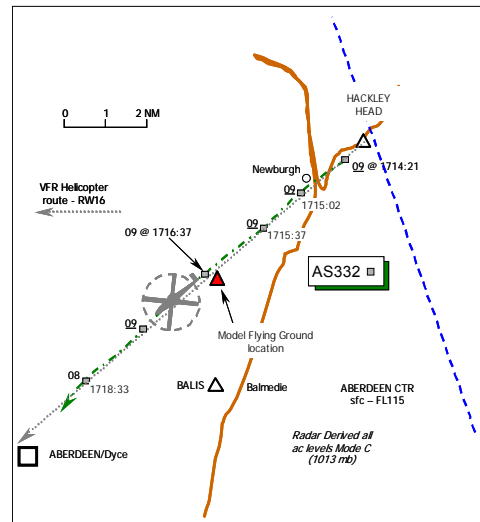
Cause: The C150 pilot flew into conflict with the JetRanger.

Degree of Risk: C.

AIRPROX REPORT No 105/03

AIRPROX REPORT NO 105/03

Date/Time: 9 Jul 1715
Position: 5716N 0203W (3nm N Balmedie)
Airspace: Aberdeen CTR (Class: D)
Reporting Ac Reported Ac
Type: AS332L Model Aircraft
Operator: Civ Comm Civ Club
Alt/FL: 1000ft <100ft-estimated
(QNH 1017mb) agl
Weather VMC CLBC
Visibility: 25km
Reported Separation:
200m H/100ft V
Recorded Separation:
NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE AS332L PILOT reports his helicopter has a red, white & blue livery and the HISSL was on whilst flying VFR inbound to Aberdeen at 130kt and in communication with Aberdeen TOWER on 118.1MHz; a squawk of A7057 was selected with Mode C.

About 3nm N of Balmedie, heading 240° flying at 1000ft Aberdeen QNH (1017mb) he first saw “a puff of smoke” through the chin window a couple of seconds before he recognised it as a model ac - a red monoplane – that was manoeuvring at 2 o’clock about 100ft below his helicopter. No avoiding action was taken as the model ac passed 100ft below his ac and 200m away down the starboard side. In a subsequent telephone conversation he opined that the risk of a collision was “lowish – depending on how far away the model ac operator was”. He warned ATC in case the model conflicted with any other traffic.

THE CHAIRMAN OF THE MODEL FLYING CLUB, a commercial helicopter pilot, reports that on this day two other members of the club and himself were present with 5 model ac between them – 4 of which were coloured red, but all were under 7kg and more of the order of 2kg auw.

During the period that model flying was taking place a number of helicopters had flown near by. He believes that when the AS332 approached there were three models airborne; one was subsequently landed and the other two were descended to 100ft agl or below and positioned in an area clear of the helicopter.

All model flying was conducted in accordance with their club’s safety recommendations adding that he was completely satisfied that there was no safety risk to either the helicopters, model ac or persons on the ground.

UKAB Note (1): In a subsequent telephone conversation the Chairman stressed the club’s positive attitude to flight safety. He said that the club had been operating in the close vicinity of the helicopter routes into Aberdeen for many years, firstly at Newburgh and then latterly at this flying ground [position 57° 16.02” N 002° 03.35”W which from the OS map gives an elevation of about 212ft (65m)] and were accustomed to overflights by AS332 helicopters and on every occasion ensured that they were accorded safe separation.

THE SCOTTISH AEROMODELLERS ASSOCIATION (SAA) comments that the local club, which is sponsored by the helicopter pilot's company, have investigated this incident to the best of their ability. The flying ground is registered with Aberdeen ATC, but the site appears to be at the start of the 'flight path' for helicopters returning to the Airport and naturally receives a higher incidence of overflights compared with 'most' clubs. At the time of the reported Airprox, 3 AS332 helicopters passed the site but did not appear to follow any unusual route and the club's standard procedure was followed which complied with SAA guidelines. These clearly give the full size ac priority and entail action by model ac operators if it is recognised that the full size ac and model might fly within 500ft of each other. Model ac operators are briefed to descend their model ac to a height *"that separates the aircraft and to land if possible until the danger is passed"*. It would appear from the club's report that this has been accomplished and on this occasion one model was landed whilst the other two manoeuvred safely at an appropriate height until the helicopter had passed. In the short time available it would have been unsafe to attempt to land more model ac.

On busy flying days, this model flying club utilises a person (or persons) for spotting to ensure that ac approaching at lower altitudes than normal are detected and suitable warnings issued to model fliers. It should also be noted that a high proportion of club members are current or former commercial helicopter pilots, which influences the club's attitude to overflights in a positive manner. Those ac that do pass are normally well above the height range of model ac.

UKAB Note (2): Enquiries with Aberdeen ATC revealed that there is no 'registration' of model flying grounds nor any established SOP for notification of model flying activity within the CTR between the ATSU and model flying clubs.

UKAB Note (3): The ScACC radar recording only shows the track of the AS332 helicopter through the Aberdeen CTR, which closely follows the promulgated VFR route for helicopters inbound to RW16 at Aberdeen [elev 215ft], which was in use at the time. The model ac is not shown. The helicopter passes directly through Hackley Head reporting point and is shown approaching the vicinity of Newburgh at 900ft Mode C (1013mb) – which equates to 1020ft Aberdeen QNH (1017mb). The AS332 maintained this level throughout the transit, past Newburgh and the area of the model flying club, until it turned at 1718:33, for its approach.

UKAB Note (4): 'The Air Navigation Order 2000', at article 87 (2), specifies that *"the person in charge of a small ac which weighs more than 7kg...shall not fly such ac:...*

in Class...D...airspace unless the permission of the appropriate air traffic control unit has been obtained;

(d)at a height exceeding 400ft above the surface unless it is flying...[in Class D airspace]....and in accordance with the requirements thereof;

Article 129 (1), specifies that:

'Small aircraft' means any unmanned aircraft, other than a balloon or a kite, weighing not more than 20 kg without its fuel but including any articles or equipment installed in or attached to the aircraft at the commencement of its flight;

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilot of the AS332 and the Chairman of the Model Flying Club, radar video recordings and a report from the relevant National Aeromodellers Association.

AIRPROX REPORT No 105/03

Board members were briefed on the advice obtained from CAA legal staff, which confirmed that flight by model ac of under 7kg unladen mass was not inhibited in Class D CAS by article 87 (2) of the ANO, hence the model club was legitimately entitled to be operating their small models in the CTR. What was questionable was the height of the model ac and its proximity to the AS332. From the radar recording it was evident that the AS332 pilot had flown his VFR transit of the CTR at the appropriate altitude; the helicopter was not abnormally low nor indeed did its altitude vary at all according to the Mode C, which indicated a consistent equivalent altitude of about 1020ft Aberdeen QNH (1017mb). Unfortunately, without recorded radar data showing the model, which clearly was not obtainable, there was no way of independently assessing the model ac's altitude or proximity to the helicopter. Members were aware that from the AS332 pilot's cockpit it appeared a mere 200m to starboard and 100ft below, placing the model at about 900ft ALT. This was significantly at variance with the model operator's perspective of 100ft agl - equating to about 300ft ALT - suggesting 700ft vertical separation when viewed from the ground. A helicopter pilot member opined that if the AS332 pilot was able to detect the colour of this small ac then it was probably quite close to the helicopter. Conversely, why then would the model ac operator fly this close and at that altitude it would have been very difficult to see from the ground – a mere speck? Some members speculated whether the downdraught of the helicopter at such close proximity could have damaged the model. Others wondered if the operator had lost control of the model but there was no suggestion of this from the Chairman's report. Members were unable to resolve the differing perspectives of this Airprox, and could only conclude that this report had resulted from a conflict with the model ac in Class D CAS. Supporting the AS332 pilot's assessment of risk was the absence of any avoiding action on his part. The Board agreed that from the reports available, no inherent risk of a collision had existed in these circumstances.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict with a model ac in Class D airspace.

Degree of Risk: C.

AIRPROX REPORT NO 106/03

Date/Time: 14 Jul 1240

Position: 5226N 0043E (073° (T) Lakenheath
6¼ nm)

Airspace: Lakenheath MATZ (Class: G)

Reporting Ac Reported Ac

Type: CP301 C-3 Agusta 109

Operator: Civ Pte Civ Comm

Alt/FL: 3000ft 3000ft

(QNH 1014 mb) (QNH)

Weather VMC No Cloud VMC CLBC

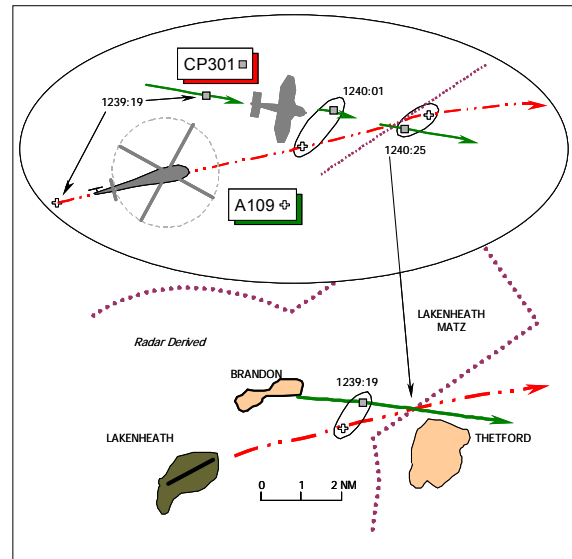
Visibility: >10km 10km+

Reported Separation:

50m H Not seen

Recorded Separation:

Tracks merged

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

THE CP301 C-3 EMERALD PILOT reports he was in transit from Bakersfield to Beccles and in receipt of a FIS from Lakenheath APPROACH on 128.9MHz. His ac has a blue & yellow colour scheme; neither lights nor SSR is fitted to his ac.

Approaching a position 2nm E of Thetford, heading 100° at 85kt and flying in level cruise at 3000ft QNH (1014mb) he first saw the blue helicopter at a range of 50m as it overtook his ac on the R about 50m away at the same altitude on a converging heading. No avoiding action was taken as the helicopter – an Agusta A109 – was already overtaking ahead, but he assessed the risk of a collision as “very high” and added that the A109 had approached from his blind spot astern. For a few moments after sighting the helicopter he flew through its wake, which caused his ac to roll to nearly 90° AoB – he opined that in 38 yr of flying this was the closest he had come to a mid-air collision.

He was aware that the helicopter pilot had been operating on the same frequency under a FIS from Lakenheath. When the Agusta pilot had ‘checked-in’, he was instructed to climb to the same altitude as himself - 3000ft (1014mb). Although Lakenheath ATC had passed traffic information to him about another ac, no mention had been made of the Agusta helicopter. He reported the Airprox to Lakenheath APPROACH, but the controller did not respond to repeated calls (she might possibly have been working another frequency). When he finally got through she did not appear to realise he was reporting traffic under her control – the A109 – whose pilot remained silent throughout.

THE AGUSTA 109 HELICOPTER PILOT reports his ac has a blue & white livery and the HISL was on whilst flying from Silverstone to Long Stratton at 130kt under a FIS from Lakenheath APPROACH on 128.9MHz. The allocated squawk was selected with Mode C ‘on’; TCAS is not fitted.

Flying at 3000ft Lakenheath QNH - clear of cloud with an in flight visibility of 10km+ out of sun - the ac flown by the reporting pilot was not seen.

He added that he had climbed at the request of Lakenheath APPROACH to 3000ft QNH on a direct route through their overhead heading 090° to Thetford, which had been agreed.

AIRPROX REPORT No 106/03

MIL ATC OPS reports that at 1218:16, the CP310C-3 Emeraude pilot called Lakenheath APPROACH *"...negative transponder for flight information"* and was instructed to standby whilst APPROACH passed continuous control and administration instructions to 4 other ac. Nearly 3½ minutes later, when reminded by the CP310C-3 pilot, the controller replied at 1221:51, *"C/S, roger, Lakenheath QNH 1014 say your position from Lakenheath."* The CP310C-3 pilot provided his flight details *"1014, altitude 3000ft, position is 4 miles NW of Ely...routeing overhead...Thetford and then E from there"* and on instructions from APPROACH, verified that he would maintain 3000ft. APPROACH transmitted *"MATZ penetration approved"* and at 1223:05, confirmed the ac type advising *"...radar contact under Flight Information Service (FIS),"* which was acknowledged by the Emeraude pilot. Along with continual transmissions to other flights, APPROACH provided traffic information to the Emeraude pilot on other unrelated traffic.

At 1230:25, the Agusta A109 pilot called APPROACH and was allocated squawk of A0453. At 1230:43, some 18 sec later, APPROACH transmitted *"[C/S] radar contact 13 miles W of Lakenheath under FIS, the QNH 1014 pass your details"*, whereupon the A109 pilot replied *"1014, FIS, we are an Agusta A109 helicopter, out of Silverstone to Long Stratton, currently 1200ft looking for onward clearance direct Thetford."* APPROACH requested, *"...can you accept a climb to 3000 to go direct Thetford"*, with which the A109 concurred. At 1235:12, APPROACH advised the CP310C-3 pilot *"...radar contact lost, report W, correction, report E of...Brandon"* to which the reply was *"we are just about on top of Brandon now."* Seconds later the A109 pilot reported *"3000 visual with activity coming"* [probably meaning visual with Lakenheath Cct traffic] and APPROACH added, *"...the traffic is at 1500."* For the next 5 min, APPROACH was involved in constant RT with other ac when the CP310C-3 pilot transmitted at 1240:41, *"I would like to file an Airprox against an Agusta helicopter."* APPROACH instructed the pilot to standby and resumed control instructions to 3 other ac for a further minute. At 1242:19 the Emeraude pilot questioned, *"what is the callsign please of the Agusta helicopter that you are working?"* to which APPROACH replied *"...if able...can you take down a...phone number...to get details."* The Emeraude pilot responded *"negative, I cannot...I will just call an Airprox with normal channel...with...the Joint Air Miss Group [sic] but...the aircraft was so close to me that it actually rocked me."* Twenty eight seconds later, the A109 pilot requested descent, which APPROACH approved. Immediately, the Emeraude pilot interjected *"...that is the aircraft that I just had an Airprox with, what is his callsign?"* whereupon APPROACH provided it. At 1245:41, APPROACH transmitted to the helicopter *"...departing my area to the E, radar service terminated, squawk 7000, frequency change approved."* Almost a minute later, APPROACH established that the Emeraude was 1nm S of Snetterton and called *"...traffic 5 miles W of Snetterton, manoeuvring altitude unknown...additional traffic E of Snetterton, 5 miles, manoeuvring, altitude unknown ...departing my area to the E, radar service terminated, squawk 7000, frequency change approved."*

[UKAB Note (1): The Debden radar recording does not illustrate this Airprox clearly as the primary only radar contact of the Emeraude (No SSR fitted) is somewhat intermittent, whereas the Agusta 109 helicopter is shown clearly, squawking A0453 though the Mode C is not evident at all, despite the pilot's report that it was selected 'on'. The Emeraude is shown passing over Brandon village on a steady course - tracking about 095° - before primary contact is lost at about 1239:23. Meanwhile, the A109 helicopter is shown passing overhead Lakenheath, steadily converging and overtaking the Emeraude on a track of about 075°. At the reported transit altitude of 3000ft Lakenheath QNH (1014mb), both the Emeraude and the A109 helicopter are within the Lakenheath Combined MATZ (CMATZ) at an equivalent height of about 2968ft above the Lakenheath aerodrome elevation of 32ft amsl. The Emeraude is shown again for one sweep at 1240:01, with the A109 overtaking on the Emeraude's starboard quarter; both ac tracks converge and the A109 crosses from R – L through the CP301's track on the eastern boundary of the Lakenheath CMATZ stub - 073° (T) Lakenheath 6¼ nm - whilst the Emeraude is shown again at 1240:25, moments after the Airprox has occurred broadly as reported by the Emeraude pilot. The horizontal distance that the A109 crossed ahead of the light ac cannot be measured with certainty as the radar returns are not both displayed at the same point before passing N of Thetford, with no significant deviation from their course.]

Both the Emeraude and Agusta 109 pilots were provided with a FIS as they transited the Lakenheath CMATZ. The Emeraude pilot requested a MATZ penetration to route to the E via Thetford at 3000ft Lakenheath QNH that APPROACH approved. Eight minutes later, on the same frequency, the Agusta A109 pilot called APPROACH at 1200ft also requesting a MATZ penetration routeing to Thetford. APPROACH specifically asked the A109 pilot if he could accept a climb to 3000ft QNH and once again approved the penetration and routeing. Since both flights were under a FIS, in accordance with JSP318A 235.125.1 [that was extant at the time but now superseded by JSP552], *“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.”* However, both ac were identified, furthermore traffic information was passed to the Emeraude pilot on other unrelated traffic and to the helicopter pilot about circuiting jets. Though some might consider it to be additional to the requirements of a FIS, APPROACH did not actually provide any pertinent traffic information to either the CP310C-3 or the A109 pilots about each other. Whereas it is specified that if *“a controller suspects...a flight is in dangerous proximity to another aircraft, a warning is to be issued to the pilot”*, no such warning was given, yet the controller had all the information necessary to provide that warning. Additionally, the regulations also state *“pilots must be left in no doubt that they are not receiving a radar service.”* Here this was ambiguous especially as APPROACH transmitted *“departing my area to the E, radar service terminated”* after the Airprox. Notwithstanding the FIS provided to both pilots whilst penetrating the Lakenheath CMATZ, the UK AIP at ENR 2.2.2.2 details for civilian pilots the nature of the ATS provided within a MATZ, the separation afforded and the form of radar service that can be provided. Indeed the Military AIP at Vol 1 ENR 2.1.3.6, reiterates this information on the ATS to be provided in a MATZ by controllers, *“the...unit providing the service will give traffic information and any instructions necessary to achieve safe separation from known or observed traffic in the zone [MATZ]. The service will, whenever possible, be based on radar observations and either a RAS or RIS will be given. When radar separation cannot be applied, vertical separation of at least 500ft between known traffic will be applied. When safe lateral or vertical separation cannot be achieved, pilots will be advised to avoid the MATZ.”* The provision of a RAS or even RIS might have been impracticable here, but if vertical separation had been applied, in accordance with the foregoing rules - such as instructing the A109 to climb to 2500ft instead of 3000ft - this incident could have been prevented. It is evident that APPROACH was working extremely hard to provide an ATS to many ac including the Emeraude and the Agusta A109 involved here. Even after the CP310C-3 had reported the Airprox on the frequency, APPROACH did not have the capacity to note the details, acknowledge the importance of the incident or verify if the A109 had been visual with the Emeraude. Without time or capacity to plan the separation or sequencing of the CP310C-3 and A109, it might have been more prudent to instruct the 2 pilots to route clear of the Lakenheath/Mildenhall CMATZ.

HQ 3rd AIR FORCE comments that in the UK, USAF controllers are bound by UK Military ATC regulations together with USAF Instructions. There is little to add to the comprehensive analysis by Mil ATC Ops. Both pilots under the FIS and on slowly converging headings for Thetford, were instructed to fly at the same altitude while transiting the Lakenheath/Mildenhall CMATZ; although traffic information was passed on a number of other ac within the CMATZ, neither pilot involved in the Airprox was warned of the proximity of the other, nor were they provided with vertical separation against each other whilst in the CMATZ. Perhaps the pilot of the CP310C-3 should have realised from the initial RT call from the A109 that he was not the only ac using Thetford as a turning point and furthermore, from the relative tracks of the 2 ac it is surprising that the pilot of the A109 failed to see and avoid the Emeraude. There is no doubt that the controller was under some pressure because, at the time, the APPROACH, DEPARTURE and MATZ positions were banded together.

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.

AIRPROX REPORT No 106/03

Evidently the Emeraude pilot was already on the APPROACH frequency and in transit through the MATZ at 3000ft QNH when the A109 pilot called for MATZ penetration. Thus he was aware of the other ac though the Board recognised that he would not have been able to spot the helicopter approaching at 1½ times the light ac's speed at a 45kt overtake from astern. No traffic information had been passed to him to warn him of the helicopter's approach but he was aware that it had climbed to his transit altitude from the RT. Conversely, the A109 pilot was apparently unaware of the presence of the light ac and was not given any traffic information by APPROACH. However, the helicopter pilot had the opportunity to hear the Emeraude pilot when radar contact was lost and APPROACH queried the latter ac's position, whereupon the Emeraude pilot reported at Brandon. Members thought that this might have been a clue and it was the last opportunity to forestall the developing conflict. But crucially the helicopter pilot reports that he did not see the Emeraude at all when he overtook it, which was clearly fundamental to the cause of this Airprox.

The comprehensive Mil ATC Ops report had shown that APPROACH was required to provide a radar service and effect mutual separation between the Emeraude and the A109 helicopter during their transit of the Lakenheath CMATZ. Evidently there was some confusion on the part of the controller as to what service was provided; it was stated on RT as a FIS to both pilots but she then transmitted to both, "...radar service terminated...". This was indicative to some controller members of the high workload conditions the controller was operating under on the bandboxed position, which was excessive. This high workload in operating three positions was outwith her control and probably had a detrimental impact on the ATS provided such that, in the Board's view, it was a contributory factor here. The HQ 3rd AF advisor explained that this busy ATC facility had suffered from manpower shortages at the time due to training shortfalls, which had now been addressed. Nevertheless, APPROACH had accepted and approved the transit through the Lakenheath CMATZ of the two ac involved here. Indeed the controller had specifically climbed the A109 – it would appear to gain separation on traffic in the Lakenheath visual cct. The HQ 3rd AF advisor explained that the FPSs written by APPROACH for both ac clearly displayed the turning point of Thetford and correctly showed their transit altitudes of 3000ft Lakenheath QNH. Thus the clues were here for APPROACH to detect the conflict that had been generated. Unfortunately, and for whatever reason, no attempt was made to provide traffic information or effect separation between these two ac within the CMATZ, which the Board agreed unanimously, was the other part of the cause of this Airprox.

It was evident that the A109's Mode C was either switched off or unserviceable – possibly unbeknown to its pilot at the time – as no altitude information was shown on the radar recording. Controller members emphasised the importance of Mode C data as crucial and the Board has stressed on many occasions the importance of this vital information for controllers. Pilots should be in no doubt that Mode C was a vital safety net that should be operated on every occasion detailed in the UK AIP. Thus, the absence of the helicopter's Mode C, coupled with no SSR data at all from the unequipped Emeraude denied the controller any further warning of the conflict that was looming as both ac approached the MATZ boundary. It was therefore not feasible to determine the vertical separation at the time, but there was no reason to doubt the veracity of the Emeraude pilot's report that the helicopter was at the same altitude. Indeed it should have been, whilst flying in compliance with the MATZ crossing instructions, and the tracks of the two ac did cross in accord with the Emeraude pilot's report. All the additional safety nets that were in place to prevent these two ac flying this close to one another in the CMATZ had been breached. The last barrier to prevent a collision - visual sighting of the Emeraude by the helicopter pilot - had also broken down. With the light ac pilot unable to spot the helicopter approaching from astern it was purely fortuitous that any horizontal separation existed at all as the helicopter overtook the Emeraude. That which there was – 50m according to the latter's pilot - was minimal and convinced the Board that an actual risk of collision had indeed existed in the circumstances reported here.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause:

- a. Lakenheath APPROACH did not provide traffic information or separation between the Emeraude and the A109 for the MATZ penetration.
- b. Non-sighting of the CP301 C-3 Emeraude by the Agusta A109 pilot.

Degree of Risk: A.

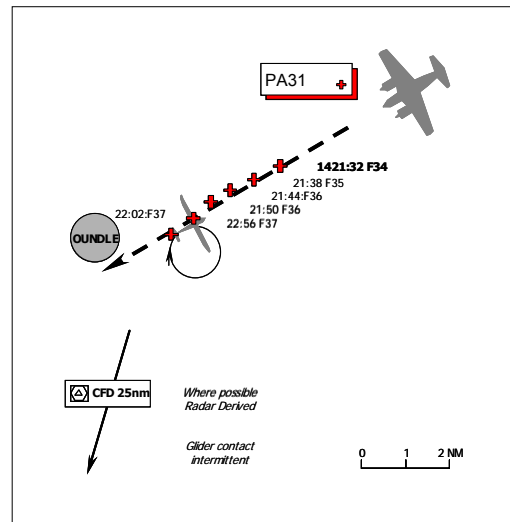
Contributory Factor:

Insufficient manpower within the Lakenheath ATC Facility precluded splitting of the 'bandboxed' APPROACH, DEPARTURE & MATZ (ZONE) control positions.

AIRPROX REPORT No 107/03

AIRPROX REPORT NO 107/03

Date/Time: 13 Jul 1422 (Sunday)
Position: 5229N 0025W (1nm E of Oundle)
Airspace: London FIR (Class: G)
Reporting Ac Reported Ac
Type: Sheibe SF27 PA31
Operator: Civ Pte Civ Pte
Alt/FL: 3900ft 4000ft
(QFE) (QNH)
Weather VMC CAVOK VMC CAVOK
Visibility: 50km + 25km
Reported Separation:
100-150ft V NR
Recorded Separation:
Contacts Overlap



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE SHEIBE SF27 PILOT reports flying a white glider with red wing tips thermalling just to the E of Oundle. While turning at 40kt and climbing in a thermal with a rate of climb of approx 300ft/min and approaching 3900ft agl, turning to the right with 40–50° of bank, he saw an ac approaching and immediately took evasive action to avoid a collision. The avoiding action he took was a steep diving turn to the right levelling out some 100ft below his previous position so that he could further assess the situation.

The ac passed directly overhead and did not deviate in any way from its previous heading or level, suggesting that its pilot did not see him. He believed that had he continued with the climb the ac would almost certainly have collided.

THE PA31 PILOT reports flying solo in a white ac with yellow and orange stripes from Peterborough Milton to St Mawgan at 4000ft at 160kt squawking 7000C. He did not see any ac in the reported position.

UKAB Note (1): The Debden Radar recording shows the PA31 soon after it gets airborne near Peterborough, tracking to the SW in a climb. One minute before the Airprox it can be seen squawking 7000 with Mode C showing 3500ft in a gentle climb. Meanwhile a glider shows as an intermittent primary return thermalling in the PA31's 12 o'clock at a reported height of 3900ft. Just after 1422 the PA31 contact closes, and finally merges with, a primary contact just as another appears very close to it (inside 200m). It is not possible to determine from the radar which contact is that of the reporting pilot, however one contact is merged, but very slightly displaced and the other is separated by just over 200m laterally at the CPA.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information consisted solely of reports from the pilots of both ac and a radar video recording.

The Board considered that since this fairly straightforward incident occurred with both pilots operating under VFR in Class G airspace, they were both therefore obliged to separate visually from other traffic. The pilot of the PA31 did not see the glider which would have been directly into sun from his cockpit and was therefore unable to take any avoiding action. They noted that there was no confirmatory evidence of the alt of the glider and therefore could not calculate the miss-distance; they had however, no reason

to doubt the glider pilot's estimate. For his part, the SF27 pilot first saw the PA31 in a gentle climb from a distance of 3-4nm and was able to take sufficient avoiding action, albeit slightly late, to ensure the safe separation of the ac.

PART C: ASSESSMENT OF CAUSE AND RISK

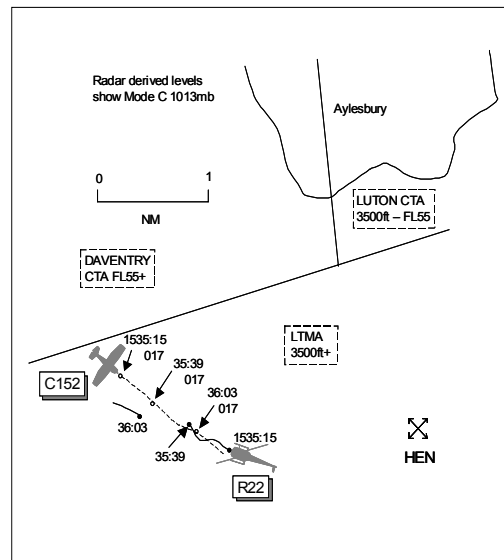
Cause: A non-sighting by the PA31 pilot.

Degree of Risk: C.

AIRPROX REPORT No 108/03

AIRPROX REPORT NO 108/03

Date/Time: 14 Jul 1536
Position: 5146N 0051W (3nm SW Aylesbury)
Airspace: FIR (Class: G)
Reporting Ac Reported Ac
Type: C152 R22 Untraced
Operator: Civ Trg NK
Alt/FL: 1900ft NK
(QNH 1015mb)
Weather VMC SKC NK
Visibility: >40km
Reported Separation:
<10m V <50m H
Recorded Separation:
NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE C152 PILOT reports flying a local dual training sortie from Halton heading 130° and in communication with Halton RADIO on 120.9MHz squawking 7000 with Mode C. The visibility was >40km with sky clear in VMC, the ac was coloured white/red and the landing and strobe lights were switched on. The student had just finished returning the ac to normal cruise speed of 90kt at 1900ft QNH 1015mb, he thought, having been operating in a slow cruise configuration of 70kt with a nose high attitude. A white coloured R22 helicopter appeared in view on his side (RHS) of the engine cowling <10m below and 50m in front, having crossed from the student's side of the cockpit flying towards his R rear quarter. The helicopter was on a track of 280/290°, in level flight, and was gone before avoiding action could be taken, having passed close to his R. He assessed the risk of collision as medium. It appeared the helicopter pilot had not seen his ac and had not given way in accordance with the Rules of the Air.

AIS MIL reports that despite tracing action the identity of the reported ac went untraced. Tracking of the unknown ac's radar return was unsuccessful as it was intermittent and could not be followed, either from a known departure point or to a destination. Procedural tracing action of R22 operators at adjacent airfields did not disclose the helicopter's identity; tracing action was finally terminated on 7th Aug.

UKAB Note (1): Met Office archive data reveals the QNH in the Aylesbury area at 1520UTC as 1012mb.

UKAB Note (2): Analysis of the Heathrow radar recording at 1535:15 shows the C152 3nm SW of Aylesbury tracking 130° squawking 7000 indicating FL017 (1670ft QNH 1012mb) with a pop-up primary only return, believed to be the R22, just to the L of its 12 o'clock range 1.2nm tracking 295°. The C152 continues on a steady track whilst the R22 is seen to deviate slightly either side of a nominal 295° track until 1535:39, when it fades from radar in the C152's 12 o'clock range 0.4nm. The R22 reappears on radar at 1536:03, after the subject ac have passed, in the C152's 5 o'clock range 0.5nm. The CPA occurs during the 24sec radar fade period of the R22, during which the C152 maintains FL017 (1670ft QNH) throughout.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included a report from the C152 pilot and radar video recordings.

The C152 student had just returned the ac to a normal cruise configuration, having previously been flying in a nose high attitude, where masking would have denied acquisition of any ac below the Cessna's cowling. After this vulnerable phase of flight and only after the normal flying attitude had been regained did the instructor see the R22 appear <50m ahead, just to the R of the ac's nose and <10m below. This had been a very late sighting, understandable because of what went before and also owing to the small target aspect presented by the Robinson helicopter head-on, but too late to take any avoiding action. The outcome amounted effectively to a non-sighting of the R22, which unfortunately could not be traced subsequently.

With no information from the helicopter pilot, there were few supported facts on which to assess risk. If the C152 had passed unsighted to the R22 pilot – i.e. by luck – members were certain that an actual collision risk existed. However, without confirmation of separation distances or whether the helicopter pilot had seen the C152, the Board could only surmise that with the effective non-sighting by the C152 pilot and the subject ac flying in such close proximity to each other, at the very least safety had not been assured during the encounter.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Effectively a non-sighting by the C152 pilot on an untraced R22.

Degree of Risk: B.

AIRPROX REPORT No 109/03

AIRPROX REPORT NO 109/03

Date/Time: 15 Jul 1054

Position: 5124N 0040W (8nm SE WOD)

Airspace: LTMA (Class: A)

Reporter: LTCC OCK SC

First Ac Second Ac

Type: A320 C402

Operator: CAT Civ Comm

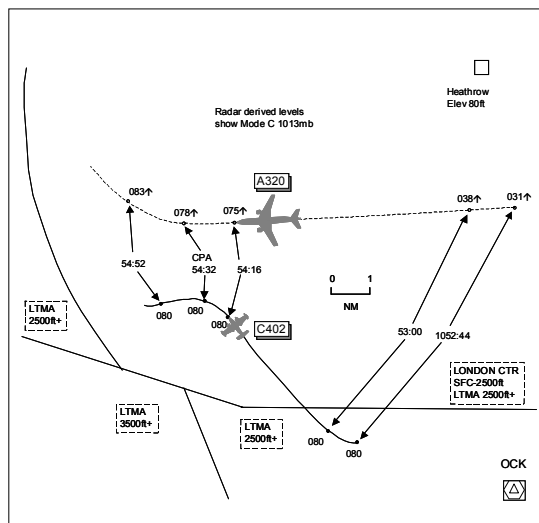
Alt/FL: ↑FL90 FL80

Weather NK VMC CLNC

Visibility: NK 25km

Reported Separation:
NR 1.5nm H

Recorded Separation:
200ft V 2nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE LTCC OCK SC reports that the C402 was operating in the OCK area at FL80 and had been for some time, working another SC on a different frequency. The A320 pilot called on his frequency at 6000ft heading 270° and was given climb to FL90; the OCK SC said he had forgotten about the C402. He added that the C402 fps was in the fps display although not in the same bay as the fps on the A320. At the time of the incident he was trying to explain the airspace and procedures to a visitor which may have caused a distraction. He gave avoiding action and TI to the A320 pilot who reported “visual” and later said no TCAS alerts had been received.

UKAB Note (1): The TC OCK RT transcript post incident shows that the SC had asked the A320 pilot if he would be filing any paperwork. The Airbus pilot replied “negative” and subsequently stated “we got no TCAS warning”. The SC replied “roger I understood that I think the er er the heading that the controller gave you was sufficient to er er er give the separation” to which the A320 pilot responded “affirm er yeah we had er good separation er good er good avoiding action A320 c/s”.

THE A320 OPERATOR’S FLIGHT SAFETY DEPT confirmed that the Capt did not submit an ASR post incident. The UKAB request for the crew to complete a CA1094 was lost and when this omission was noted, several months had passed leaving doubt that the crew would be able to recollect/provide any more information to assist the investigation.

THE C402 PILOT reports flying level at FL80 heading 320° at 160kt and in receipt of an ATS from London squawking 5005 with Mode C. The visibility was 25km in clear weather VMC, the ac was coloured white/yellow with strobe lights switched on; TCAS was not fitted. ATC gave him an immediate L turn onto heading 290° and he saw another ac about 1.5nm away to the N of him climbing through his level. He assessed the risk of collision as low.

ATSI reports that at the time of the Airprox, the A320 was in communication with the TC Ockham Sector Controller (OCK SC), whilst the C402 was under the control of the TC Biggin Sector Controller (BIG SC). The OCK SC described his workload as ‘light’ and the traffic loading as being ‘quiet’.

The C402 had been engaged for some time on a mapping detail in the Ockham area and, at the time of the Airprox, it was maintaining FL80. Its pilot was in communication with the TC BIG SC whilst the OCK SC had been provided with a pink strip on the flight, which had been specifically drawn to the attention

of the OCK SC when he took over the sector, some 3min prior to the Airprox. To remind the OCK SC further of the C402's presence, the radar return had been 'highlighted', resulting in a dashed box surrounding its radar data block.

The A320 departed Heathrow RW09R and followed a CPT5J departure. In accordance with standard procedures, the ac was initially worked by Heathrow Approach, who climbed it to 6000ft and assigned a radar heading of 270°. At 1052:45, the A320 pilot contacted the OCK SC and was instructed to climb to FL90. At that time, the ac was 3.2nm S of Heathrow, climbing through 3200ft QNH (FL031), and 7nm NE of the C402 which was still maintaining FL80. Shortly afterwards, at 1053:00, the C402 made a R turn from a westerly track onto a north-westerly one and so started to converge with the A320. At 1054:15, as the A320 was climbing through FL75, 2.5nm due N of the C402, the OCK SC transmitted "*A320 c/s turn right er heading zero heading three one five avoiding action*". STCA activated at 1054:17, and almost immediately afterwards the SC passed TI to the A320 crew who reported visual with the traffic. STCA changed from 'white' (low severity) to 'red' (high severity) at 1054:32, which coincided with the point of minimum separation, measured as 2.0nm and 200ft, as the C402 commenced a L turn away from the A320, the C402 being in the 8 o'clock position of the A320. At 1054:50, the SC instructed the A320 to climb to FL130 and turn L onto 290°, as it was clear of the traffic. Standard separation was restored shortly afterwards.

The OCK SC explained that, earlier in the morning, he had been operating as the TC SE BIG SC, and perhaps the Co-ordinator as well and was therefore fully aware of the presence of the C402. He explained that the details on such non-standard flights would be available on the sector. To the best of his recollection, he had checked the paperwork relevant to the C402. The usual procedure associated with such mapping flights was for the pilot to request any turns, in this case from the BIG SC, who would approve it or otherwise and then alert the Coordinator who would, in turn, advise any other controllers affected.

The OCK SC placed the pink blocking strip under the OCK designator, his normal practice, as the ac was, predominantly, operating in the Ockham area. Although it is understood that on occasions a second blocking strip is produced, one was not completed in this instance. The SC explained that the number of strips on the board can sometimes be excessive, and so extra pink strips are likely to exacerbate the problem.

When the OCK SC took over the position, there was a trainee controller present who was being provided with familiarisation prior to commencing training with the watch. The SC explained that once he had taken over the operational position, he set about explaining the layout of the airspace and the standard operating techniques to the trainee. The SC recalled that he had seen the A320 soon after it took off and had formulated a plan to climb it beneath a Challenger ac that was routing towards WOD. Both the strips for this ac and the A320 were under the WOD designator, on his flight progress board, whilst that for the C402 remained under the OCK designator. Once the A320 reported on frequency, the SC followed his plan and climbed it to FL90 whilst continuing on the heading of 270°.

The SC reported that, to the best of his recollection, he had heard a shout from the Coordinator advising that the C402 was turning for another W to E run. Regrettably, none of this dialogue was recorded as neither telephones nor intercom was used. However, later analysis of the BIG SC's frequency indicates that, at 1052:30, the pilot of the C402 had requested to route to Cranfield and a right turn onto 320° had been approved. This was shortly before the A320 had reported on frequency, approximately 8nm NE of the C402. The OCK SC continued explaining the sector to the trainee and then he heard a shout from one of the Heathrow Approach controllers to "*...watch the C402 c/s*". The OCK SC immediately saw the problem and set about resolving the confliction by instructing the crew of the A320 to turn right onto 315°. The SC did not use the standard avoiding action phraseology but did use the words "*avoiding action*" in his transmission. STCA activated shortly afterwards but the situation was then well on the way to being resolved. The BIG SC passed avoiding action to the C402 by instructing the pilot to turn left

AIRPROX REPORT No 109/03

onto 260°. Again, the standard avoiding action phraseology was not used but the words “*avoiding action*” were.

The OCK SC explained that, at the time, he had not considered the trainee to be an undue distraction but, having had the opportunity to reflect on the incident, the individual clearly had been.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members noted that the incident occurred 3min after the OCK SC had taken over the sector and that there was a trainee controller ‘plugged in’ for familiarisation. The OCK SC had admitted to being cognisant to the C402’s presence when he took over the Sector via the pink fps and having previously worked the subject ac on the BIG sector. However, it was thought that the exchange of information between the BIG and OCK SCs, through the S Coordinator, on the C402’s turn towards Cranfield, had been less than ideal, as it appeared the OCK SC had not correctly assimilated the Cessna pilot’s intentions. This unrecorded verbal exchange occurred about the time the A320 pilot was issued with climb clearance to FL90. The pink fps was in place on the fps board as an ‘aide memoir’, reinforcing the fact that FL80 was blocked in the OCK area. ATCO members believed that even if the C402 had been turning for another W-E run, it was still operating within its planned area and the OCK SC should have found out which direction it was going to turn. The OCK SC had formulated a plan to climb the Airbus, subject to a conflicting Challenger ac, but inexplicably he had not taken the C402 into account when he issued the clearance. This had caused the Airprox.

Following a prompt from an adjacent Heathrow controller, the OCK SC was alerted to the developing conflict and had given an avoiding action R turn to the A320 pilot, immediately prior to STCA activating. The Airbus pilot had reported ‘visual’ with the C402 after receiving TI but had subsequently reported that no TCAS alerts had been received. The BIG SC had given an avoiding action L turn to the C402 pilot who then visually acquired the A320 to his R climbing through his level. All of these elements when 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 TC OCK SC did not take the C402 into account when he climbed the A320 into conflict.

Degree of Risk: C.

AIRPROX REPORT NO 110/03Date/Time: 17 Jul 1228Position: 5233N 0102E (12nm SW of Norwich
elev - 117ft)

<u>Airspace:</u>	London FIR	(Class: G)
	<u>Reporting Ac</u>	<u>Reported Ac</u>
<u>Type:</u>	B757-200	F15E
<u>Operator:</u>	CAT	Foreign Mil
<u>Alt/FL:</u>	FL65↑	NR

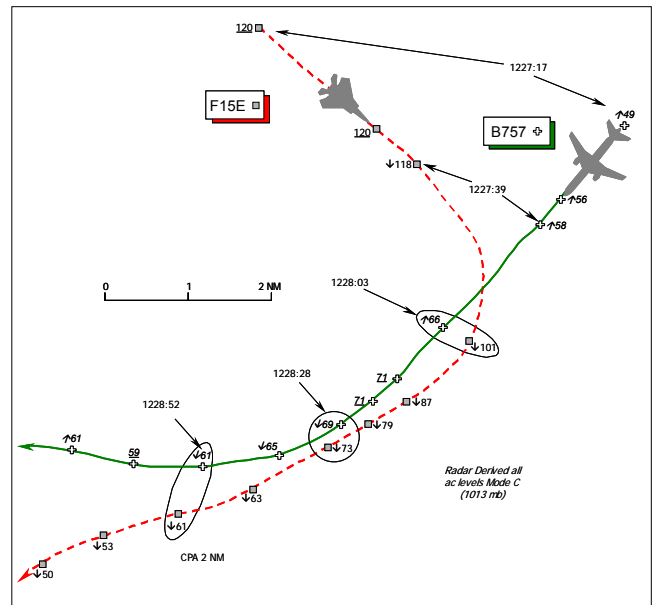
Weather: VMC CLBL NRVisibility: 10km NRReported Separation:

200-400yd H/nil V Not seen

Recorded Separation:

Min H: 300m @ 400ft V

Min V: nil @ 1200m H

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

THE B757-200 PILOT, the PNF, provided a comprehensive report stating that he was departing from Norwich IFR, outbound to join CAS at BARKWAY (BKY) at 250kt, under a RAS from Norwich APPROACH on 119.35MHz and squawking A3702 with Mode C; TCAS is fitted. His jet has a red/white & blue livery and the landing lamps, HISLs and anti-collision beacon were all on. The 1st officer was the PF, with the autopilot engaged. Approaching a position about 12-15nm SSW of the airport, on course to BKY heading 230° and climbing through FL60 for their assigned level of FL80, TCAS enunciated a TA with an aural warning of "TRAFFIC" that was depicted on the vertical speed indicator at 10 o'clock at "close range" - 2700ft above them. Almost immediately thereafter, the Norwich controller issued an avoiding action R turn onto a heading of 270°. The PF initiated the R turn using the autopilot, whilst he looked for the traffic. The controller's R turn instruction was followed immediately by a TCAS RA to "DESCEND", so the PF disengaged the autopilot and followed the commanded descent, which was almost immediately followed by an "INCREASE DESCENT" RA, before TCAS then enunciated "CLEAR OF TRAFFIC". By this stage they were rolling out on 270°(M) at FL65, when a dark coloured F15 jet was spotted at the 11:30 position 200-400yd away descending "slightly" through their level and pulling away. He assessed the risk of a collision as "high".

[UKAB Note 1: Following their review of Airprox 221/99, the UKAB recommended that the CAA considered providing guidelines to operators on the response expected from aircrew when ATC gives instructions using the phrase "avoiding action". The CAA accepted this recommendation and published AIC 100/2000 (Pink 12), dated 16 November 2000, which reminded pilots of the response expected to instructions using this phrase.]

THE F15E PILOT provided a very brief report stating that his ac has a light grey camouflage scheme, but HISLs are not fitted. He did not know if an ATS was provided whilst inbound to Lakenheath IFR, but SSR was fitted and the assigned code had been selected with Mode C; neither TCAS nor any other form of CWS is fitted. He did not see, nor did he have any knowledge of, any other ac in the vicinity of his jet whatsoever. Apparently, his microphone in the front cockpit was inoperative; all radio calls would, therefore, have been from the rear-cockpit and "in-flight communications" [presumably meaning the cockpit intercom between both crew members] was "impossible".

AIRPROX REPORT No 110/03

THE NORWICH APPROACH RADAR CONTROLLER (APR) reports that the B757 crew was released on track BKY climbing to FL200. Shortly after departure whilst under a RAS, the B757's climb was stopped at FL50 because of traffic converging from the NW and descending, that was under the control of LATCC (Mil) CON12. The unknown ac [the F15E] levelled at FL140, he thought, so he instructed the B757 crew to climb to FL80, to keep the ac climbing to achieve the specified CAS joining level of FL200. The unknown ac continued to track SE to pass the B757 but then the squawk changed to A0416 – assigned to Lakenheath. Shortly afterwards the A0416 turned towards the B757 crew and descended. An avoiding action turn onto 270° and traffic information was given to the B757 crew who almost immediately advised they were descending with a TCAS RA. The B757 crew then became visual with the unknown ac - which they identified as an F15. Prescribed separation was eroded, although the APR did not specify the minimum horizontal/vertical separation. He was subsequently advised that the B757 pilot was filing an Airprox and added that he had attempted to co-ordinate the B757 with LATCC (Mil)'s traffic initially and subsequently with Lakenheath; in both instances he was unable to obtain a reply on the landline.

MIL ATC OPS reports that the F15 crew contacted the Lakenheath APPROACH Controller (RAPCON) at 1226:34, level at FL120. The crew was instructed to squawk "...when able..." and radar contact confirmed at 1227:07. Shortly thereafter, at 1227:22, the F15 crew was instructed to "... descend and maintain FL45, can you turn right heading of 240?", which was complied with. The form of ATS provided by RAPCON to the F15 crew was not formally agreed until 1228:19, when a RAS was specified just before a further descent was passed to "...2500 altimeter is two niner eight two". The F15 crew was cleared for an ILS approach RW24 at 1228:30, and transferred to the final controller at 1230:26.

Analysis of the Debden radar recording shows the B757 climbing out of Norwich at 1225:40, when the F15 was about 10nm NE of Marham. The F15 levelled at FL120 and the squawk changed to a Lakenheath code at 1226:53, the B757 is then at left 10 o'clock - 6nm climbing through FL37 Mode C (1013mb). The F15 commenced a descent with the B757 at L 11 o'clock less than 2½nm indicating FL56. The F15 turns R just after 1227:40, taking the fighter directly over the climbing B757 and placing the F15 on a parallel course displaced just to the S of the airliner.

Apparently the F15 was recovering to Lakenheath with an emergency, although LATCC (Mil) has no record of any reported problem with the ac at the time. RAPCON was also expecting further emergency traffic, inbound with an engine problem and in company with another jet, that was under the control of LATCC (Mil). This would have undoubtedly put pressure on the Lakenheath controller especially as they had to place ac in the holding pattern, some of which subsequently had to divert for fuel. The controller does not recall seeing an ac with a Norwich SSR code in the vicinity of the subject F15. However, since the controller believed erroneously that he was providing a RIS - indeed RIS is marked on the relevant FPS - he stated he would have issued traffic information. Clearly the controller's recollection is wrong on both accounts; the transcript confirms the F15 was under a RAS and no traffic information of any sort was passed. It is most improbable that the B757 would not show on the Lakenheath radar equipment - although this cannot be confirmed independently. It is evident that the rules prescribed at JSP 552 235.110 for a RAS were not adhered to by RAPCON, who descended and turned the F15 into conflict with the B757.

ATSI reports that the B757 crew contacted APPROACH at 1226, reported passing 3000ft ALT in the climb to FL200. The flight was placed under a RAS just before 1226:30, and the crew instructed to stop the climb at FL60, which was read back correctly. The radar recording shows the F15 tracking SE, levelling at FL120, 10.3nm WNW of the B757. Shortly afterwards the B757 crew was instructed to climb to FL80. Having changed squawk to A0416 [Lakenheath] at 1227:33, the F15 is shown commencing a descent from FL120 Mode C on a conflicting track with the B757 – that is only 2.2nm away - as the airliner climbs through FL57 Mode C. The F15 descends as the B757 climbs and the military ac comes into close horizontal proximity with the airliner as it turns towards it. An 'avoiding action' R turn using the correct 'new' phraseology format was issued to the B757 after 1227:30, "[C/S] avoiding action [C/S] turn R heading 270 traffic just passed over the top of you turning towards you passing [FL] one hundred descending". The B757 pilot reported, at 1228:00, "roger we have a TCAS". The APR advised, "...he's

suddenly dropped from 140 going down past your level...just overtaking you", whereupon the B757 crew responded *"okay turning right...and we're TCAS descent this time turning right onto 270°"*. Just before 1228:30, the pilot of the B757 reported visual contact, *"...we've got him...he's about...a few hundred yards in front of us now just descending through our level...an F15"*. The APR advised the B757 crew that he *"..cannot get answer off the telephone"* from Lakenheath to *"...see what he's doing"*. The B757 crew reported, *"...I've got him in contact at the moment...he's in fact slightly slower than us as he descended through our level..we're rolling out on 270° we're about paralleling his track now he's now in a left turn about ½nm off..in our 10 o'clock..."*, adding *"we're gonna file on that one"*, which was acknowledged.

Up until the F15 descended and turned towards the B757, there was at least 3000ft vertical separation between the two flights, which was in accordance with the provisions of a RAS at MATS Part 1 procedures (Section 1, Chapter 5, Pages 2/3) where controllers shall seek to achieve vertical separation of not less than 3000ft Mode C. When the Controller realised that this separation might be compromised, due to the unpredictable change of the F15's flight path, he issued an avoiding action turn using the appropriate phraseology. It was at this point that the pilot reported a TCAS Alert. The APR reported that he tried to co-ordinate his traffic with both LATCC (Mil) and Lakenheath but was unable to obtain a reply on the landline. It has not been possible to access the APR deskside recordings because of a recorder problem at Coltishall, where Norwich APPROACH is situated.

[UKAB Note (2): The Debden radar recording illustrates this Airprox clearly; the F15 is shown level at FL120 Mode C at 1227:17, some 10 sec after Lakenheath RAPCON reported radar contact, as the B757 climbs though FL49 Mode C. The fighter's Mode C is shown passing FL118 at 1227:39, in response to RAPCON's instruction to *"... descend and maintain FL45, can you turn right heading of 240°?"*, whereupon the F15 turns R over the track of the B757 and starts to overhaul the airliner as the latter climbs through FL66 and the F15 descends through FL101, 0.3nm away. This was about the time that the APR issued the avoiding action R turn onto 270°. The F15 descends down the port side of the B757 as the airliner ascends to FL71, before the crew respond to the reported *"DESCEND"* RA. This is apparent from 1228:28, as the B757 descends through FL69 with the F15 400ft above it, descending through FL73 and the point at which the B757 crew probably spotted the fighter. The tracks converge to a minimum parallel displacement of about 300m [0.166nm] and then diverge, as the F15 descends through the level of the B757 at 1228:52, in the latter's 10 o'clock at 1200m [0.66nm], whereupon the B757 'bottoms out' at FL59, before recommencing the climb and leaving the F15 descending below it.]

HQ 3AF comments that the brevity of the F-15 pilot's report can be explained by, what was for him, an entirely uneventful recovery, other than his microphone failure, during which he did not see any other ac that gave either him or his back-seater, who was making all the radio calls, cause for concern. If the Lakenheath controller was using a radar source and display of a quality similar to that of the Debden radar recording, it seems inconceivable that he would have vectored and descended the F15 into direct conflict with the outbound B757, thereby ignoring the rules for both RIS and RAS or the advisability of coordinating with the Norwich APR. If the incident was as clear cut as the Debden radar recording and narrative reports suggest, it seems likely that there may have been a problem with the Lakenheath radar, yet neither the ATC nor Communications Squadron [ground radio maintenance] logs reveal any outages. There appears to be no rational explanation for the Lakenheath controller's actions other than he simply did not see the Norwich outbound, either by virtue of equipment shortcomings or maybe as a result of some unknown distraction.

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 110/03

The HQ 3AF advisor explained that comments during the investigation of previous incidents, together with other conflicting reports suggested that the Lakenheath SRE has a history of 'dropping' tracks thereby placing the reliability of the radar equipment in question. If that was so here and the Lakenheath SRE had 'dropped' the B757's track in this instance, thereby making its radar contact and associated plot-extracted symbology disappear and invisible to RAPCON, that could explain why the controller never attempted to avoid the airliner under the RAS that applied. The Chief Controller at the Lakenheath ATC facility had attempted to run this faulty equipment suggestion to ground, but could find no evidence to support such an assertion. RAPCON was very busy and one answer might be that the controller had selected to display on his 'scope' discrete 'selected' SSR codes only; if that was the case then only specific selected SSR codes would be shown and if the B757's was not one of them a small symbol would surround the associated primary return without any label or Mode C indication. This method is sometimes used when directing a busy radar pattern to make a controller's own ac more distinct and the picture less cluttered with SSR labels. To work safely this technique relies on the controller being alert to other traffic by detecting the plot extracted symbol around other primary contacts thereby alerting him or her to the presence of other 'unknown' ac. If that was the case in this incident, the controller had evidently not seen the corresponding B757 primary return and SSR symbol either, which should also have been obvious to him. However, this was all conjecture and the Board was unable to resolve with certainty why the controller had not taken any action at all with respect to the B757.

As it was, RAPCON did not attempt to provide standard separation between the F15E and the airliner nor try to co-ordinate with the APR, as he was apparently unaware of the B757. Thus the F15E crew had not been told about the airliner's presence, nor had they spotted it on their own AI radar because a crossing track at this geometry would probably not be within their equipment's ability to detect it. Moreover, the F15E crew was descending toward the unseen airliner climbing beneath them and not aware of the impending danger at all. Conversely, the APR had spotted the confliction as the fighter descended out of its intermediate stop at FL120 and was crossing ahead of the airliner. Although he had tried to co-ordinate with both LATCC (Mil) and RAPCON there was no information available to resolve why this had not been achievable. Nevertheless, controller members reinforced that at that stage the chance of concluding a co-ordination agreement in the time remaining would have been slim. Avoiding action should always be offered at an early stage if there was any hope of achieving meaningful separation and the APR's decision to pass a prompt avoiding action R turn onto W was wise. Moreover, controller members noted this was one of the few recent instances reviewed where the new format phraseology had been used. However, it seemed to the pilot members that the B757 crew's slow response to this turn instruction had contributed adversely to the eventual outcome of the Airprox. The radar recording suggested that the turn was quite wide and whilst standard separation of 5nm would not have been achievable against the nimble jet slightly more horizontal displacement away from the F15 might have been obtained. CAT pilot members reinforced the wisdom of taking out the auto-pilot and hand flying the ac to achieve the most effective response – which typically might allow a higher AOB of 40-45° to be achieved instead of the 20-25° achievable on auto-pilot, thereby giving a tighter response and potentially greater displacement away from the 'threat'. Here, the combination of the APR's turn instruction to the B757 crew and their reaction to it were the final safety nets left before TCAS was called upon to act.

Although the F15 pilot's microphone was inoperative this was not in itself an emergency and though certainly not desirable, a normal recovery to base was achievable in these circumstances given adequate crew co-operation and a reasonable degree of training. However, it would certainly have entailed a higher workload on their part and some suggested that lookout scan might have been impaired. One fast jet pilot member observed that the F15 was descending toward the B757, which would have been obscured underneath the fighter's right wing whilst overtaking it slowly. Therefore, after the F15 had rolled out of the turn, the airliner was always abaft the beam and the fighter crew would have been unable to see it unless they took positive action to check for other ac, which evidently they did not. The STC member was concerned about this and believed the F15 crew was not absolved from looking for other ac – adding that in the combat environment not to 'check 6' astern could be a deadly mistake. However, they were flying IFR and had a reasonable expectation under the RAS that RAPCON

said was being provided that standard separation would be afforded against other traffic. The absence of any action by RAPCON – for whatever reason - to forestall this close quarters situation should not have occurred. A part of the ‘system’ provided to ensure a safe ATS to the F15 crew had not performed as it should have done, whether it was an equipment deficiency or lack of appreciation by the controller concerned. Therefore, members agreed that this Airprox had resulted because the F15 was vectored by RAPCON into conflict with the B757 whilst under a RAS.

Nevertheless, the developing conflict was detected by the B757’s TCAS, which generated a TA followed by an RA to descend. Whether the crew’s response to the RA would have resolved the conflict entirely was not clear, as the airliner was evidently not able to achieve the rate of descent demanded for resolution while the F15 caught it up. There was nothing to suggest the B757 crew was not doing their utmost to comply with the demanded RA, but the rate of descent of the F15 outstripped their ability and that of the airliner to descend out of its way until the fighter started to draw clear in azimuth, whence TCAS would have moderated the descent demand. Some believed that TCAS had not resolved the conflict at all, but with no TCAS fitted to the F15 to provide a complimentary RA, it had certainly ‘worked as advertised’ in this uncoordinated scenario. TCAS does not seek to achieve anything like the standard separation afforded under a RAS (3000ft unco-ordinated Mode C or 1000ft co-ordinated) rather it is designed to provide enough vertical separation to avert a collision. Here, the combination of the APR’s avoiding action turn, the successive TCAS alerts culminating in the RA which induced the B757 crew to descend and finally their sighting of the F15 all played their part in resolving sufficiently this difficult situation and forestalled the risk of an actual collision. At the closest point these two ac were only 300m apart but still separated vertically by 400ft, before the tracks started to diverge; 1200m displacement was achieved as the F15 descended through the level of the airliner – not a comfortable distance. The Board agreed unanimously and with certainty that in the circumstances reported here the safety of the ac involved had been compromised.

Controller members were concerned about the unresolved suggestion that the Lakenheath SRE was not up to the task and in their view this should be investigated more thoroughly. Therefore, the Board recommended that HQ 3AF investigate fully the unsubstantiated reports of Lakenheath SRE/SSR unreliability, to ensure that the equipment is operating to a satisfactory level for the ATSS provided by Lakenheath RAPCON.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Whilst under a RAS the F15 was vectored by RAPCON into conflict with the B757.

Degree of Risk: B.

Contributory Factors: The B757 crew was slow to react to the Norwich APR’s avoiding action turn instruction.

Recommendation: That HQ 3AF investigate fully the unsubstantiated reports of the Lakenheath SRE/SSR unreliability, to ensure that the equipment is operating to a satisfactory level for the ATSS provided by Lakenheath RAPCON.

AIRPROX REPORT No 111/03

AIRPROX REPORT NO 111/03

Date/Time: 11 Jul 1313

Position: 5206N 0057W (3nm NE Silverstone)

Airspace: FIR (Class: G)

Reporting Ac Reported Ac

Type: ASW19 Glider PA28RT

Operator: Civ Pte Civ Comm

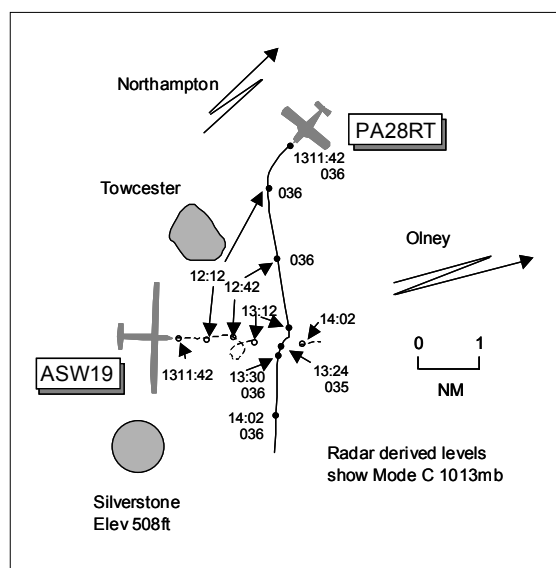
Alt/FL: 3400ft NR
(QFE) (QNH)

Weather VMC CLBC VMC HZBC

Visibility: 15km 8km

Reported Separation:
20ft V 60ft H 100ft V 100m H

Recorded Separation:
NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE ASW19 GLIDER PILOT reports flying solo on a planned closed circuit cross-country from Gransden Lodge with a route via Silverstone, Bury St Edmunds and Olney. Frequency 130.4MHz was selected on the radio but it was switched off as it was very busy with RT transmissions. The visibility was >15km 1000ft below cloud in VMC and the ac was coloured white. An extensive blanket of cirrostratus to the S of Gransden had been causing concern, its presence meant that gliding conditions in the tasked area were initially not good. At 1307, he turned around Silverstone and then set course to the E. At 1312 he carried out 1 RH orbit and as the cirrostratus had thickened considerably, he was concerned that the preferred direct track to Bury would be in dying gliding conditions. As it happened, what he did next nearly set up conditions for dying. He steadied on a 040° heading towards the SE corner of Northampton and looking ahead he saw another glider about 2nm away to the N but nothing else. Looking to the R towards Cranfield, he tried to decide whether he should go in that direction and pick out a possible route. This took about 10-15sec (far too long as it turned out) for when he next looked ahead, a single engined ac (possibly a Rockwell Commander type) was directly in front of him, about 200yd away, heading straight towards him. He realised that even though he knew what had happened and what needed to be done about it, getting his body to respond with appropriate velocity was like trying to rush treacle through a straw. The other pilot must have seen him first because a split second after seeing him, the other ac was seen to roll rapidly to the R and climb slightly, to shoot past in a near vertical banked attitude, 20ft above and displaced by about 60ft to his L. He pushed and dived and although this may not have been the recommended response, as the ASW19 does roll reasonably fast, there didn't seem to be enough time to roll. Post flight the data logger showed a fairly rapid increase in G/S from 56kt to 83kt but surprisingly with no large loss of height; this might be explained by thermal activity which showed on the variometer log at the time. After it had passed, he saw the other ac roll level and then turn L before disappearing from view. He was disappointed that even though there had been good visibility, he had not seen the piston ac at the time he had first seen the other glider. Both his ac and the piston were white and the geometry was almost head-on presenting a small target aspect to acquire. Nevertheless, he felt that he owed the other pilot a serious apology for allowing himself to become distracted by tactical considerations. He assessed the risk of collision as near fatal.

THE PA28RT PILOT reports flying as an examiner on a CAA CPL Skills Test and in receipt of a FIS from Cranfield on 122.85MHz squawking 7000 with Mode C. The visibility was 8km in hazy VMC, the ac was coloured white and the strobe lights were switched on. During the simulated IMC navigation phase with

IF screens up in the cruise, he had twice previously given the 'candidate' turns off-track to avoid manoeuvring gliders but had then had to take control of the ac to resolve the conflicts. On this third occasion he had seen the subject glider, which was clearly manoeuvring and searching for thermals, for 2min before the incident and maintained constant visual contact with it. He initially took no avoiding action owing to the manoeuvring of the glider, which was turning R in his 1-2 o'clock position crossing R to L, but it then turned L towards him at the same level. He initiated avoiding action, which by now was late, by turning slightly R to avoid it as it was seen to cross ahead obliquely, descending, and eventually clearing 100m to his L and about 100ft below. It had been obvious that the glider pilot had not seen his ac from the evasive action that it took during the encounter. He assessed the risk of collision as slight. Furthermore, he went on to express concern over the efficacy of using a full set of IMC screens which often were ill-fitting and restricted the vision of the examiner - he usually flew with, typically, the first three screens in place which then left him with good vision to the R. He proffered the following solutions: -

The CAA permits the use of 'foggles' or a hood for simulated IMC assessment.

The CAA permit the simulated IMC assessment to be carried out in a Flight Navigation Procedures Trainer (FNPT) I/II simulator.

The CAA abolishes the requirement for an IMC assessment on a Commercial VFR CPL skills test.

In his role as an examiner, it was becoming difficult to provide a practical route for a test candidate to fly owing to the proliferation of glider sites and other airspace hazards. Commercial flight tests of this nature cost £1100 per flight and should be afforded some sort of priority.

THE CAA GENERAL AVIATION DEPARTMENT comments:

On the condition of the screens: the flight examiner is responsible for accepting the screens used on flight tests. If the screens were "ill-fitting" or excessively restricted the examiners view, the examiner should withdraw the aircraft's approval to be used on flight test until the screens meet the required standard.

Alternatives to screens: the use of foggles or IMC Hood, as alternatives to screens for the CPL skill test, had already been approved at the time of this incident. Foggles/hood remain an option, but screens provide the best environment for testing Instrument skills. Well-designed and maintained screens should not restrict the examiner's view unduly.

IMC assessment: work to amend the CPL skill test profile was well under way at the time of the incident. The modified profile (introduced in Jan 04) does not require navigation under simulated IMC conditions; this change allows the examiner considerably more flexibility in his choice of routes. The assessment of instrument flying skills on CPL skill tests is an ICAO requirement. It is considered essential that a commercial pilot should have at least basic instrument skills including the ability to recover from unusual attitudes. These are now tested as a 'safety module' separate from the Navigation phase.

FNPT: under JAR-FCL 1 the examiner has always had the option to assess instrument flying in a FNPT.

Finally, the examiner is responsible for the safe conduct of the flight test; this includes choice of route and traffic avoidance.

UKAB Note (1): Met Office archive data reveals the QNH for the Silverstone area as 1021mb.

UKAB Note (2): The Airprox is not seen on recorded radar. Analysis of the Debden radar recording supplemented with the ASW19's GPS data log at 1311:42 shows the PA28RT 5.5nm NE of Silverstone tracking 220° indicating FL035 (3740ft QNH 1021mb) with a primary only return, believed to be the

AIRPROX REPORT No 111/03

ASW19 glider, in his 12 o'clock range 4.5nm tracking 090°. At 1312:12 the PA28RT is seen steady tracking 175° at FL036 (3840ft QNH) with the glider now in his 1 o'clock range 2.75nm still tracking 090°. Thirty sec later the ASW19 is seen to commence a RH orbit rolling out on a track of 075° at 1313:00 before fading from radar 12 sec later with the PA28RT in its 11 o'clock range 0.6nm crossing L to R. At 1313:18, the PA28RT is seen to deviate slightly to the R, as it is now tracking 230° before it turns L, 6sec later, onto a track of 180° indicating FL036 (3740ft QNH). The Airprox is believed to occur during the glider's radar fade period before it reappears on radar at 1314:02 in the PA28RT's 7 o'clock range 1.2nm tracking 090°.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members agreed that the ASW19 pilot should have seen the PA28RT earlier but had allowed his lookout scan to be degraded for the reasons he had explained so honestly. The attitude taken by the glider pilot in accepting some responsibility for the incident was commendable, but ultimately the PA28RT Capt was responsible to see and avoid the glider under the Rules of the Air Regulations. Despite an early visual acquisition of the glider, the PA28RT Capt had flown his ac into conflict with it and this had caused the Airprox.

Members could not resolve the disparate descriptions of the incident and the actions taken. From the ASW19 cockpit, the pilot had seen the Piper very late 200yd ahead and took action to resolve the conflict by diving, but this was only carried out after he had seen the Piper pilot take rapid avoiding action by rolling steeply to the R. He reported the PA28RT had passed 20ft above and 60ft clear to his L. From the PA28RT cockpit, the Capt had seen the glider 1-2min prior to the incident and had allowed his ac to close on the glider which had then turned L towards him. Unlike the glider pilot's account, he reported turning slightly R and watched it cross R to L and pass 100m clear to his L and 100ft below. Regardless of these recollections, however, the Board believed that the PA28RT Capt had flown close enough to the glider to affect adversely his ability to avoid it to the extent that safety had not been assured during the encounter.

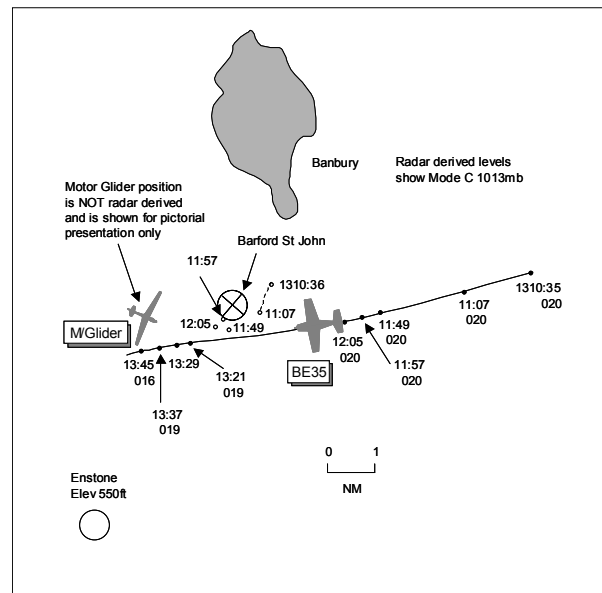
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The PA28RT Capt flew into conflict with the ASW19 Glider.

Degree of Risk: B.

AIRPROX REPORT NO 112/03

Date/Time: 14 Jul 1314
Position: 5159N 0124W (5nm SW of Banbury)
Airspace: Oxford AIAA (Class: G)
Reporting Ac Reported Ac
Type: Venture M/Glider BE35
Operator: Civ Trg Civ Pte
Alt/FL: 1800ft↓ 2000ft
 (QNH 1016mb) (RPS)
Weather VMC CLNC VMC CLBC
Visibility: >15km >10km
Reported Separation:
 20-30ft V <100ft V 100m H
Recorded Separation:
 NR

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

THE VENTURE MOTOR GLIDER PILOT reports flying a dual training sortie from Enstone and in communication with Enstone RADIO on 129-87MHz; no transponder was fitted. The visibility was 15-20km in clear sky/no cloud conditions and the ac was coloured blue/white. About 2nm W of Barford St John disused airfield after having closed the throttle and selected carb heat on to simulate a practice engine failure, the student was busy selecting a suitable landing area and carrying out cockpit drills whilst he monitored the student's performance and kept a lookout. Heading about 170° and descending through 1800ft QNH 1016mb, he thought, in a 15-20° low AOB R turn at 60kt, he suddenly heard an engine increasing power followed by a blur of a blue/white ac diving in the opposite direction; the other ac's fin passed 20-30ft under his port wing. He took control and quickly turned starboard to see a V-tailed Beech Bonanza flying away at great speed in a westerly direction, believing that the Beech pilot had been trying to avoid his ac. Both he and his student were badly shaken and considered themselves extremely lucky that they had escaped a collision. Neither of them had been aware of any other ac in the vicinity even though they were heads up in the cockpit during the exercise; no other ac had been seen prior to commencing the turn. He assessed the risk of collision as extremely high as he had only seen the other ac at the point of near impact.

THE BE35 PILOT reports heading 250° at 160kt and 2000ft RPS en route to Gloucestershire and establishing contact with Brize ZONE for a service on 119-0MHz squawking 7000 with Mode C. The visibility was >10km in VMC, the ac was coloured white/blue/silver and his strobe lights were switched on. After receiving a squawk code from Brize, he looked down to change the code setting on the transponder but upon looking up he saw a glider, he thought, coloured blue/white slightly ahead of him range 400m crossing R to L, slightly above in a gradual descent and in a L turn towards him, he thought. He immediately executed a descending steeply banked L turn to avoid it, passing 100m to its L and <100ft below. This had been a late sighting, the glider had appeared from behind a window post and, at this point, Brize reported traffic to him in his 1 o'clock. He assessed the risk of collision as high.

MIL ATC OPS reports that the BE35 pilot's report was received 45 days post incident. Consequently the RT tapes had been reused and the controller's recollections were scant. The fps indicates that the BE35

AIRPROX REPORT No 112/03

pilot called on the Brize frequency at 1315 and was provided with a RIS. The unit reports that the records and logbooks do not indicate that anything unusual or alarming happened during the period concerned. The controller concerned reported that nothing extraordinary could be remembered about the flight. Working from the reported time of the incident and the BE35 pilot's report, it is believed that the BE35 called Brize at the same time as the Airprox occurred and that ac in close proximity were called by the controller as soon as possible thereafter.

UKAB Note (1): Met Office archive data shows the QNH in the Banbury area at 1315UTC as 1013mb and the Cotswold RPS 1300-1400UTC as 1008mb.

UKAB Note (2): Analysis of the Clee Hill radar recording proved inconclusive as the Airprox is not shown. At 1310:35 the BE35 is seen 6nm SE of Banbury steady tracking 260° squawking 7000 indicating FL020 (2000ft QNH 1013mb) with an intermittent primary only response, believed to be the Venture Motor Glider, in its 1 o'clock range 5.3nm tracking 190°. The Motor Glider fades from radar at 1311:07, reappearing at 1311:49, adjacent to Barford St John disused airfield, for 3 sweeps manoeuvring just to the R of the BE35's 12 o'clock range 2.5nm. The BE35 continues tracking 260° indicating FL019 (1900ft QNH) when, at 1313:29, the squawk disappears for one sweep before 8sec later a 3701 code is seen (Brize Allocated Code) indicating FL019 (1900ft QNH). The Airprox is believed to occur during the next radar sweep as 8 sec later Mode C indicates FL016 (1600ft QNH) which accords with the BE35 pilot's reported avoiding action manoeuvre.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

This had been an encounter in Class G airspace where 'see and avoid' principles pertained. The BE35 pilot had the opportunity to see the Venture well before the Airprox, prior to going 'heads-in' to change the transponder code setting, but only saw the Motor Glider very late upon looking up. Equally the Venture crew had the opportunity to see the approaching BE35 but they were busy during the simulated PFL. The instructor was monitoring the student's performance as well as maintaining a 'lookout' scan, and only reported seeing the Beech as it passed under his port wing which members agreed was effectively a non-sighting. Both captains had their attention split, captured by tasks other than lookout, as their ac closed undetected.

Turning to risk, it was clear that this had indeed been a close encounter with the Venture instructor first hearing, then seeing the Beech as it passed 20-30ft below his wing, too late to take any action. The Beech pilot fortunately saw the Motor Glider 400m ahead and took positive action by turning L and diving his ac, passing within 100m of and <100ft below. From this reconstruction of events the Board agreed that the BE35 pilot's actions had been enough to remove the risk of an actual collision, but leaving a situation where the ac had passed in such close proximity that safety had not been assured during the incident.

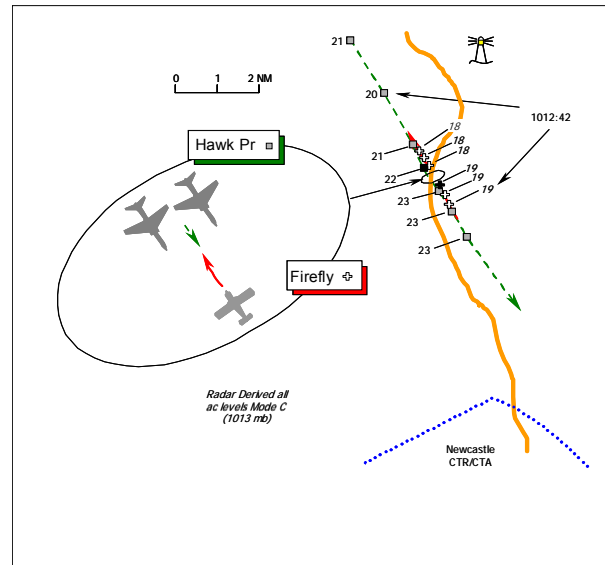
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Effectively a non-sighting by the Venture Motor Glider crew and a very late sighting by the BE35 pilot.

Degree of Risk: B.

AIRPROX REPORT NO 113/03

Date/Time: 22 Jul 1013
Position: 5517N 0134W (3nm SW by S of Amble Light)
Airspace: Scottish FIR (Class: G)
Reporting Ac Reported Ac
Type: Hawk Pair Slingsby T67C
Operator: HQ STC Civ Trng
Alt/FL: 2200ft 5000ft
(RPS 1007mb) (QNH 1012mb)
Weather VMC CLBC VMC CLOC
Visibility: Unlimited 10km+
Reported Separation:
50ft V/nil H 200ft V/nil H
Recorded Separation:
Tracks merged

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

THE HAWK PILOT, a Qualified Pilot Navigator Instructor (QPNI), reports he was flying as the No2 of a pair of black Hawk ac engaged on a low-level pairs sortie instructing a prospective Navigator Training Unit Instructor who was flying in the rear seat of the No1 ac. The HISL and nose landing light were switched on in both ac. Though they had just called Newcastle ATC, they were 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.

Approaching 3nm S of Amble light, heading 180° a practice bird strike on the No1 was initiated. Both ac pulled up from low-level to 500ft below the cloud base, which was between 2600 - 3000ft. Flying at an altitude of 2200ft RPS (1007mb) after decelerating to a speed of 280kt, a visual inspection was initiated by the No2 to confirm any signs of 'simulated damage'. As the No2 closed to echelon starboard, both front seat pilots simultaneously saw a light ac 300-500ft ahead – he believed immediately in front of and below the No1 Hawk ac. No avoiding action was taken - there was no time available - as the other ac (a light single engined bubble canopy type, painted white) passed 50ft below the leading jet with no horizontal separation. The Airprox was reported to Newcastle ATC from whom the formation was in the process of obtaining an ATS. He assessed the risk of a collision as "high".

THE SLINGSBY T67C FIREFLY PILOT reports his ac has a predominantly white colour scheme with red/blue lining; the white wingtip HISLs were on. A squawk of A3777 was selected with Mode C whilst under a FIS from Newcastle TOWER on 119.7MHz, he thought erroneously at 5000ft Newcastle QNH (1012mb). Heading 340°, on the coast S of Alnmouth, flying at 95kt, a formation of 2 Hawk ac was spotted with their landing lights on 1nm away head-on just about to pass above his aeroplane. The pair of jets flew 200ft directly above - straddling his ac - flying straight and level, but he took no avoiding action because they were sighted too late. He stressed that the jets were clearly going to pass above him and added that there was no obvious reason for the late sighting apart from the small head-on aspect and high closing speed. He did not assess the inherent risk.

NEWCASTLE ATC reports that at 1013:00, the lead Hawk crew called Newcastle APPROACH on 284.6MHz and immediately reported, "...had a light aircraft just went right underneath us missed by about 50 feet", which the controller acknowledged. The pair were placed under a RIS 1min after their initial call and then conducted a practice forced landing without further incident.

AIRPROX REPORT No 113/03

The light ac involved was a T67 operating VFR under a FIS from TOWER. Following the Airprox when the T67 pilot was questioned by TOWER “...did you see anything”, he replied “...yes – I saw the two Hawks, they passed over the top of us – I’d ‘ave said at about 200ft over the top”. Adding later “...we saw them in plenty of time actually I don’t think there was any real risk of a collision”.

UKAB Note: The Great Dun Fell radar recording shows the Hawk pair as a single contact squawking A7001 passing west of Amble Light indicating 2000ft unverified Mode C (1013mb) at 1012:42, with the reported Firefly directly ahead at 12 o’clock – 3nm squawking A3777 at 1900ft unverified Mode C (1013mb). The subject ac close on exactly reciprocal tracks with no lateral displacement, in general accord with the pilots’ reports, as the Hawks climbed slightly to 2200ft Mode C with the Firefly still at 1900ft just before the merge. However, the Firefly’s contact is then lost for one sweep at 1013:04, when the projected tracks merged. The Firefly is shown thereafter to have descended 100ft to 1800ft Mode C as the Hawk pair maintained their course toward the Newcastle CTA at 2300ft Mode C, suggesting that vertical separation was in the order of 300ft before the CPA, but 500ft thereafter.

THE HAWK PILOT’S STATION comments that this “very close miss” happened, not unusually, at a period of high cockpit workload when the attention of both crews was focused elsewhere concentrating on the close formation join. This resulted in degraded lookout and they did not spot the light ac that would have ordinarily been difficult to see in the prevailing conditions. This is a salutary lesson for all on the requirement to maintain a good lookout, whatever the cockpit workload.

HQ STC supports the Station’s comments. When involved in distracting manoeuvres then crews must beware of degrading their lookout. When in close formation or during a formation change, leaders must remember that they will have to perform the majority of the lookout while the wingmen focus on them.

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 ATSU involved and a report from the appropriate operating authority.

The crux of this Airprox in the ‘see and avoid’ environment of the ‘Open FIR’ was one of lookout, but there were mitigating factors that had affected both the jet crews and the T67 pilot. The predominantly white coloured Firefly had approached at an exactly head on aspect to the Hawk pair - at a constant relative bearing - with virtually no relative motion to draw attention to it, thereby impeding early visual detection by the Hawk pilots and masking the Firefly’s presence from them until the last moment. In the Station’s view the simulated birdstrike exercise had focused the attention of the No2 Hawk crew at the critical moment as they moved into close formation on their leader, diverting their eyes away from scanning ahead and the Board agreed this probably had a significant detrimental effect on overall scan. Nevertheless, while the leader was charged with the lookout for both ac as the No2 moved into echelon, the reporting pilot said that both he and the leader saw the Firefly at the same time some 300-500ft ahead. It was in similar scenarios to this incident – a head-on closing geometry - that the PTC TCAS trial had proved so effective. Indeed 30sec warning had been achieved, which attested to the desirability of a collision warning system to supplement lookout scan. The Board wholeheartedly endorsed the acquisition of such equipment to assist military pilots and its use here might well have averted this Airprox. From the other cockpit the Firefly pilot had to contend with similar geometry that also impeded his early detection of the jets until the Hawks’ landing lights attracted his attention 1nm away, slightly earlier than the jet pilots’. Here the Hawk nose light had proved to be an invaluable aid to conspicuity again. Some controller members were concerned that the T67 pilot was operating with TOWER under a FIS, and thought that it would have been more useful to operate with APPROACH when the radar position was manned. Whilst members could only speculate if a warning might have been feasible under such circumstances, and recognising it was only a FIS, some controller members thought APPROACH might have been prompted to transmit a warning to the T67 pilot, which clearly

TOWER was unable to provide. The Board concluded that a very late sighting by both the Hawk crews and a late sighting by the Firefly pilot had caused this Airprox.

Turning to risk, these ac were closing at a speed of 375kt – nearly 200m/sec. It is generally accepted that the time required to see another ac, take action to avoid it and actually alter the ac's flight path would take in the order of 2sec. Although the Hawk pilot reported they were unable to avoid the T67 in the time available, the STC member thought that instinctive self-preservation might have altered the situation, albeit that it would have undoubtedly resulted in an over-stressed airframe. However, at the reported sighting range of 300-500ft [90-150m] the Hawk crews would probably have been unable to alter their acs' flightpath significantly and take effective avoiding action. From the Firefly pilot's candid account he reported that he had spotted the jets' lights at a range of 1nm, which gave him little more than 9sec, enough time to alter his ac's flightpath out of the way, but he reported he did not have time to do so. This suggested that if he believed he had no time available to act he had probably seen the Hawks some 200ft above him at a range of less than 1nm. Alternatively, the Hawks had been further above his aeroplane than he thought and nearer to the 300ft suggested by the radar recording. Indeed, his RT transmission after the event had evinced little concern, but it was not feasible to determine with absolute certainty the vertical separation that pertained here because of the momentary loss of unverified Mode C data from the Firefly at the critical moment, nonetheless, the respective tracks had indeed merged in azimuth. However, from the respective pilot's accounts it seemed to the Board that any separation that had existed was purely fortuitous, thus the members agreed that the safety of these ac had not been assured.

PART C: ASSESSMENT OF CAUSE AND RISK

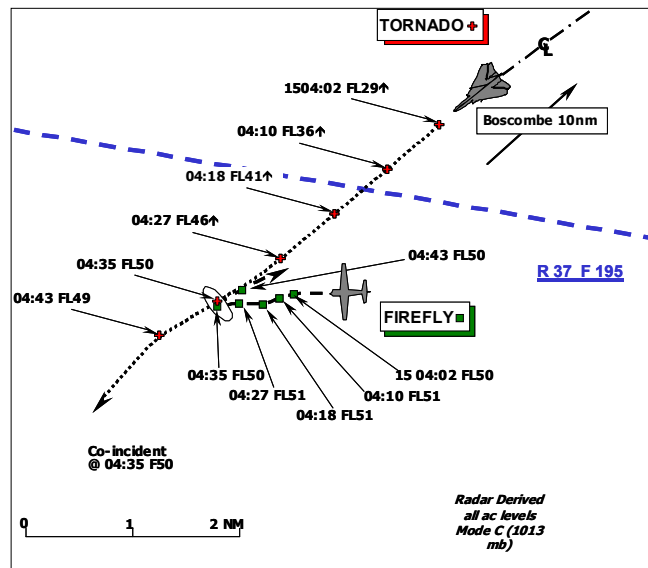
Cause: A very late sighting by the Hawk formation and a late sighting by the Firefly pilot.

Degree of Risk: B.

AIRPROX REPORT No 114/03

AIRPROX REPORT NO 114/03

Date/Time: 22 Jul 1505
Position: 5105N 00150W(Overhead Salisbury)
Airspace: London FIR (Class: G)
Reporting Ac Reported Ac
Type: Firefly Tornado GR1
Operator: HQ DAAvn DPA
Alt/FL: FL50 FL50
Weather VMC VMC
Between layers Below Cloud
Visibility: >20km >10km
Reported Separation:
100ft H 50ft V H1000ft 100ftV
Recorded Separation:
Contacts Merge with 100ft V.



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE FIREFLY PILOT reports heading 270° at 100kt and had just levelled off at FL50 over the W side of Salisbury on an instructional sortie from Middle Wallop when a red, white and blue Tornado passed under his right wing from the rear on a similar heading in level flight. He estimated that it had passed approx 50–100ft below and 100ft horizontally to his right. He was squawking 2677C and monitoring a tactical frequency. He did not see the ac until it was passing him as it had approached from his rear and he was not able to take any avoiding action. He considered the risk of collision was high.

MIDDLE WALLOP ATCO reports that the Firefly was operating on the unit's training 'quiet' frequency and squawking 2677, Middle Wallop's conspicuity code. The pilot called APP to report an Airprox stating that a Tornado had missed him by less than 100ft horizontally and slightly below. He did not see the other ac on radar, as he was not actively monitoring the Firefly, but called Boscombe Zone immediately to establish the callsign of the Tornado.

Weather at Middle Wallop was Blue Vis 40km Few 4500, Bkn 6000 QNH 1018, QFE 1008.

THE TORNADO GR1 PILOT reports that he was operating as a singleton on a Test Pilot instructional sortie from Boscombe Down in a red, white and blue Tornado with HISLS and Nav lights selected on. He called for take-off and was immediately cleared for a standard departure to climb on runway track of 230° into the operating block of FL50 to FL200. One TI call was passed on initial contact with Boscombe Radar, but geometrically this could not have been the Firefly involved in the Approx. He was not aware of any other TI calls concerning the Firefly being passed by ATC, either as part of the take-off clearance or in the time period before the sighting occurred. Although it was a relatively late sighting he saw the Firefly at ½nm, and safe separation was maintained by a gentle turn to the right through 30°. The turn was flown in such a way as to remain in visual contact with the other ac until well after they had overtaken it. It appeared that the T67 was on the same heading as they were and that they overtook it, but he considered that the T67 would have been unable to see them until the ac were abeam each other. He assessed the risk of collision as high until he saw the other ac and took avoiding action when it reduced to nil.

THE FIREFLY STATION comments that this Firefly sortie was properly constituted and authorised, taking place in uncontrolled airspace and in good VMC conditions.

Despite this it seems that the possibility of a collision was high. As the Firefly was squawking a recognised Middle Wallop code with Mode C, they would have expected Boscombe Down Radar to warn the climbing Tornado of the presence of the Firefly.

That said, the risk would have been greatly reduced if the Firefly had called Boscombe; while it is understandable that the Firefly instructor would wish to conduct training in a “quiet” environment, flight safety must take precedence.

AFG at Middle Wallop should re-address the RT procedures adopted when flying in this busy airspace.

ATSI reports that there were no apparent civil ATC causal factors. Middle Wallop ATC is staffed by civil controllers but working under JSP552. The Firefly departed VFR to the SW of Middle Wallop and shortly after, reported changing to the training 'quiet' frequency. This frequency is used by Middle Wallop based ac when operating in the local area and is monitored by Wallop Approach for alerting purposes only.

MIL ATC OPS reports that the Boscombe tape transcripts were 36 sec ahead of the radar recording and have been adjusted to UTC; therefore all timings in their report are UTC.

The Tornado launched from Boscombe Down and called Boscombe Radar (RAD) at 1503:42: *'Radar, C/S is airborne climbing into the block'*. TI was immediately passed on *'traffic south, tracking East, 1 mile, no height information'* to which the pilot advised that he was *'looking'*. RAD then passed TI to other ac under his control before returning his attention back to the Tornado when the crew were asked to *'climb report established in the block FL50, FL200'*. At this time the Tornado crew reported that they were *'.....visual with the T67 just coming down the side.....'*. Further traffic was called at 1504:46 *'.....12 o'clock, 4 miles crossing left right, indicating FL50, believed to be a Tutor'* (but not the one involved) and 13sec later the Tornado crew requested confirmation that RAD *'didn't have on radar that contact who went fairly adjacent about 2 miles back?'* to which RAD replied that they had been *'just about to call you on that one, but we were working 2 frequencies at the moment, we were talking on another frequency at the time'*. The Tornado crew responded that this was *'no problem, it was a T67, probably from Middle Wallop'* and shortly after the Tornado was formally identified and placed under a RIS.

Analysis of the Cleve Hill Radar video recording shows the Firefly manoeuvring 4.5-6nm SW of Boscombe. The Tornado appears on radar at 1504:01 just under 4nm to the SW of Boscombe with the Firefly in his left 11:30 at a range 2.5nm crossing left to right. The contacts merge at 1504:37. The contact call by RAD as *'traffic south, tracking east, 1 mile, no height information'* is not seen on the recording.

There appears to be a number of issues that contributed towards this incident. A Trainee Controller that was, according to his Mentor, working almost to capacity manned RAD. He was working 2 frequencies; 2 Hawks were on one and another ac was on the second, which the Tornado was also expected to call on. The 2 Hawks had just split for individual GH which further complicated the situation. At the time the Unit was operating an internal call-for-release system, indicated to the ADC by illuminated lights. The ATC Order Book at 100.180.1 states:

'Call for Release' may be instigated by any controller in the ACR and is primarily designed to ensure the safe integration of departing traffic with arrivals and transits in the local area. In particular, the RAD Controller should instigate 'Call for Release' when:

- a. Notified of recovering traffic that will be opposite direction to traffic climbing out from the visual circuit area.
- b. A MATZ crosser is approved that could affect traffic on departure.

AIRPROX REPORT No 114/03

c. The CMATZ is declared IFR or the Colour Code is GRN or worse .

Additionally, the system may be used to regulate traffic intensity and the Unit standards bulletins also stipulate that when issuing a release, APP should pass any pertinent TI to the ADC with the release. On this occasion the lights were on, nevertheless ADC released the Tornado without clearance from APP/RAD, although he checked for conflicting traffic on the DFTI. This was beyond his remit and he has been briefed accordingly. However, it is surmised that, given the prevailing weather conditions, had the request been made, the Tornado would have been released without delay. On first contact RAD passed TI to the Tornado, although this traffic cannot be seen on the video recording. Although not formally identified at that time, since the Tornado was climbing out on a notified departure and squawk, this was a reasonable call. What happened next was a matter of individually perceived priorities and RAD elects to pass TI to other ac on his frequency. This traffic was operating outside the recorded area so the TI urgency or relevance could not be assessed. However, TI on the Firefly should have been passed to the Tornado pilot and the Mentor should have stepped in to do this. While the TI would still have been late, it may have been enough to provide additional warning.

This incident has highlighted fundamental flaws in the IFR procedures at Boscombe Down, which are discussed further at ANNEX A.

HQ STC have recommended that Boscombe Down review their IFR procedures to make them more robust and to allow ATC to afford departing ac more protection.

HQ DAAvn comments that the procedures for light fixed wing training from Middle Wallop undertaken in this vicinity were established under the guidance of Boscombe Down many years ago. As the CMATZ authority, both the squawk and Training Frequency were assigned to Middle Wallop ac by Boscombe Down, specifically to identify such training ac without further recourse to additional RT activity and is not dissimilar to the procedures adopted in the Cranwell/Barkston region.

The Firefly crew were undoubtedly 'spooked' by this experience and all Firefly ac now call Boscombe Down on leaving the CMATZ. DAAvn would, however, prefer Boscombe Down to ratify the need for this change, as it would be a revision to their own advice and clearly would not apply to any other ac operating in that portion of Class G airspace.

DPA comments that there are a number of issues that relate to the cause of this Airprox

Firstly, it could be considered prudent when operating in an area where fast jet ac climb out on departure, to be in communication with an appropriate ATC unit capable of giving TI.

Secondly, the incident occurred in an area where other units also operate fast jet traffic, again communication with an ATC unit might provide a measure of awareness of these ac.

That said, the issue regarding the IFR departure procedures might be considered to be a 'red herring' since any departure, whether on a predetermined heading/level or not, into class G airspace could just as easily engineer an Airprox as avoid one. The IFR departures are designed primarily to de-conflict, not separate, Boscombe Down arrivals and departures.

Although the Boscombe Down procedures were not adhered to, it could be argued that in this instance, it would appear the Tornado would have been released with little or no delay.

Boscombe Down has conducted a review of the procedures and of the entry in the Mil AIP (editorial only: not UK AIP as stated in HQ STC Report) and continues to monitor and adjust as and when circumstances dictate.

ANNEX A to

Airprox 114/04 Pt A

As published in the UK AIP AD2 - EGDM- 1-11 the standard IFR departure is to maintain RW track climbing to 2000ft QFE until instructed or cleared otherwise by ATC. Had this procedure been followed, this Airprox would not have occurred. However, discussion with Boscombe Down ATC revealed that the published procedure has been superseded and the AIP will be rectified in due course. For fixed-wing departures, light ac and helicopter IFR departures the Flying Order Book Para 397.120.3c states:

‘On all runways ac are to maintain runway track, climbing to the level specified by ATC. The level will, where possible, be aimed at satisfying the requirements detailed on the pilot's warn-out. However, where there is local area traffic to conflict, it will be aimed at providing adequate vertical separation until lateral separation can be assured. The departure clearance by Ground will be in clear in the format "Depart runway track, FL xx (or xxxx ft), stud...., squawk....". The level cleared to, squawk and frequency are to be acknowledged. (Note: where a level block is requested on the warn-out, the term "Depart runway track for the block, stud...., squawk..." may be used by Ground’).

It continues to explain that since the departure profiles from all runways route towards CAS, for initial departure if radio contact is not established with the radar controller by 10nm or FL90, ac should level off and turn back towards the Boscombe Down local area to allow time to rectify the problem.

Whilst the Ground Controller is charged with performing "those duties delegated to him by the ADC as contained in local orders" the time difference between Ground pre-noting APP of a pending IFR departure and the ac rolling, can be lengthy. Therefore the 'clearance' as detailed above may not afford protection to a departing IFR ac. It is ADC's responsibility to sequence mixed arrival and departure of visual and instrument traffic, consequently a release should have been requested and a clearance obtained when the ac was ready (i.e. roll within 30sec of the clearance) for departure. Had the request been received, a height restriction (not above 1850ft QFE 1008 to maintain 3000ft separation against the Firefly's indicated level) could have been imposed or the ac held on the ground.

The Boscombe Down Flying Order Book at 397.120.3a details departure procedures and states that, unless otherwise requested the following services will be applied automatically to site-based ac departing:

- (1) FIS VFR departures.
- (2) RIS IFR departures when the aerodrome colour state is White or better.
- (3) RAS IFR departures when the aerodrome colour state is Green or worse.

As the weather conditions were Blue and the ac were to be under a RIS, even if call-for-release procedures had been followed, APP thought that the Tornado would have been released without restriction. It is doubtful that any TI would have been included as part of the release. Under RIS the pilot is wholly responsible for maintaining separation from other ac whether or not the controller has passed TI. Although RAD would have had some notice of the impending departure, given the time scale between the Tornado crew calling and the contacts merging (28 sec) it is doubtful whether the RAD trainee's reactions would have been different. After passing TI to the Tornado, it appears that the trainee transferred his attention to the Hawks on his other frequency. This action would have left the Mentor with little time or opportunity to intervene effectively.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Although there were many factors contributing to this Airprox, it was in essence, very straightforward. Despite the Tornado being on an 'instrument departure', both ac were operating VFR in Class G airspace, therefore both crews were obligated to see and avoid other ac. The Firefly pilot was pointing in the same direction as the overtaking Tornado, therefore under the rules of the air the Tornado pilot was obliged to give way to, and avoid, the Firefly by a safe margin. Although the Tornado pilot saw the Firefly late, he had the opportunity to manoeuvre his ac, in both planes, more aggressively than he did and Members considered that had he given the Firefly a wider berth the incident would have been prevented. Members were informed that the pilots of both ac were very experienced, but it was unsurprising that the Tornado's proximity had caused concern to the Firefly instructor. It was not possible however, to determine the precise miss-distance since the contacts merged on radar with 100ft vertical separation; Members considered therefore, that the lateral separation had been somewhere between the pilots' respective estimates of 100 and 1000ft. Nevertheless, the Tornado pilot had maintained visual contact with the Firefly throughout the avoiding manoeuvre and therefore ensured that there had not been any risk of their colliding.

Specialist ATC Members considered that, although the Tornado had not been formally identified and placed on a RIS, the lack of TI from Boscombe Radar had been remiss and had contributed to the Airprox. Had the Tornado pilot been warned of the Firefly's presence it is likely that he would have taken avoiding action earlier and therefore avoided the Firefly by a greater margin. While Members accepted that the RAD controller under training had been working to capacity, they considered that the Mentor should have stepped in and passed TI. Further they considered that the absence of a release call from the ADC (trainee or mentor) had meant that the departing Tornado had not been anticipated by RAD, which may have contributed to his lack of time to pass TI. Members considered that although it had not caused this Airprox, the casual application of the rules and procedures by Boscombe ATC had played a part, albeit small.

Although Members noted that there were several procedural and integration factors between Boscombe Down and Middle Wallop, and some minor points of Airmanship, they had been overemphasised in the comments above and none had contributed directly to this incident; however, in order to ensure that procedures continue to meet the needs of both units, HQ DAAvn agreed to consult with DPA and determine whether any change is required.

PART C: ASSESSMENT OF CAUSE AND RISK

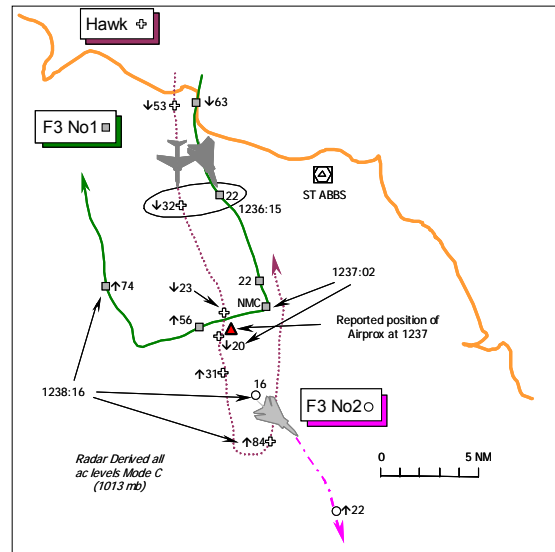
Cause: The Tornado flew close enough to cause concern to the Firefly pilot.

Degree of Risk: C.

Contributory Factors: The lack of TI on the Firefly to the Tornado pilot from Boscombe Down RAD.

AIRPROX REPORT NO 115/03

Date/Time: 24 Jul 1237
Position: 5546N 0223W (10nm SW of ST ABBS)
Airspace: Scottish FIR (Class: G)
Reporting Ac Reported Ac
Type: Tornado F3 Untraced light ac
Operator: HQ STC NK
Alt/FL: 2200ft NK
 RPS (1002mb)
Weather VMC CLBC NK
Visibility: 30km NK
Reported Separation:
 100ft H/400ft V NR
Recorded Separation:
 NR

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

THE TORNADO F3 PILOT reports his ac has a grey camouflage scheme and the HISL was on whilst leading a pair of Tornado F3s during the final stages of a 2v1 intercept against a Hawk. They were in receipt of an Air Defence Information Service (ADIS) from CRC Buchan [equivalent to an ATS of a FIS below 5000ft ALT] on 300.55MHz and squawking the assigned code with Mode C. Neither TCAS nor any other form of CWS is fitted.

Some 1200ft below cloud descending through 2200ft RPS (1002mb) at 500kt in a R turn passing 200°, he suddenly saw a white high-wing single engine light aircraft (LA) 500ft away at 11 o'clock in his peripheral vision, so he pulled up hard and rolled to avoid it. Both he and his navigator saw the LA 100ft away crossing obliquely from L – R, 400ft beneath their jet before it opened to starboard. He assessed that the risk of a collision was “*very high*” and added that they were close enough to be concerned that their jet’s wake might have caused the other ac some problems.

AIS (MIL) reports that the LA is not evident on the ScATCC radar recordings at all, nor was it recorded on AD radar sources. Further enquiries with the reporting pilot revealed little more information and despite extensive procedural tracing action, this ultimately proved fruitless. Therefore, the identity of the reported LA remains unknown.

THE TORNADO F3 PILOT’S STATION comments that the risk of collision in this report was clearly high. It is a timely reminder that, notwithstanding the increased situational awareness afforded by GCI and AEW radar, all crews must keep their eyes out of the cockpit and be prepared for the unexpected.

UKAB Note(1): This Airprox is not shown on the ScATCC (Mil) radar recording. The No1 F3 and Hawk are shown coasting in at 1235:44, descending through FL63 & FL53 respectively. The No1 F3 continues to fly parallel to the Hawk’s course, but displaced some 2nm to the E, before turning westward at 1237:02 – at about the time of the reported Airprox. No Mode C is shown by the No1 F3 until after the fighter crossed the Hawk’s track; at 1237:20 the No1 F3 is shown climbing through FL56 which may be indicative of the No1 F3 pilot’s avoiding action. The No1 F3’s track at this point is about 1nm NW of the reported Airprox position. The No2 F3 is only shown about 1min later at 1238:16, as the pair and the Hawk open, probably for another intercept.

AIRPROX REPORT No 115/03

UKAB Note(2): Under the ADIS the pilot was responsible for safe separation from other traffic. The nearest available ASACS radar source was out of service for testing at the time, so CRC Buchan was utilising NATS radars, which did not detect the LA.

HQ STC comments that the freedom to train and exercise tactically that Class G airspace provides, also brings risks and responsibilities. The Station's comments are well made. Good lookout is a lifesaver.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included a report from the F3 pilot, radar video recordings, and a report from the appropriate operating authority.

Despite an extensive search, tracing action had not revealed the identity of the white high-wing single engine aeroplane that had been spotted very late by both the pilot and navigator in the lead F3. This was a rather inconclusive end to the investigation of this occurrence and with only one side of the story it was doubly difficult to draw meaningful lessons. When denied their own AD radar source, the CRC was evidently unable to detect other ac at the incident's level on the NATS radar in use, as evinced by the ScATCC (Mil) radar recording. Therefore, the F3 crews had to rely on their own AI radars and visual acuity in the 'see and avoid' environment of the 'Open FIR'. Apparently, their ac's own radar had also been defeated, so in the Board's view the crux of this Airprox was one of lookout and its members echoed the F3 Station's sage words. But there might have been mitigating factors that had affected the jet crew's ability to spot the other ac. The unknown ac had first appeared in their 11 o'clock and their relative tracks then crossed obliquely; possibly there had been no relative motion to draw attention to it beforehand as the jets closed at high speed (500kt). Thus early visual detection was impeded and masked the white ac's presence from the jet crew until the last moment when they saw it to port a mere 500ft away and flying toward them, after they had initiated a descending R turn. However, with so little information to go on the Board could only conclude that the cause of this Airprox had been a conflict with an untraced light ac resolved by the lead F3 crew.

With neither the lead F3 crew's lookout nor that of his wingman disclosing the presence of the LA until a very late stage – white against the background terrain underneath – it was fortunate that the robust avoiding action taken by the lead F3 pilot had achieved an estimated 400ft vertical separation above the untraced LA. This pull-up and roll had effectively removed the risk of a collision, but it was apparently an uncomfortably close encounter nonetheless. The Board's view, in line with the reporting F3 pilot's own assessment, was that the safety of the ac involved here had not been assured by any means.

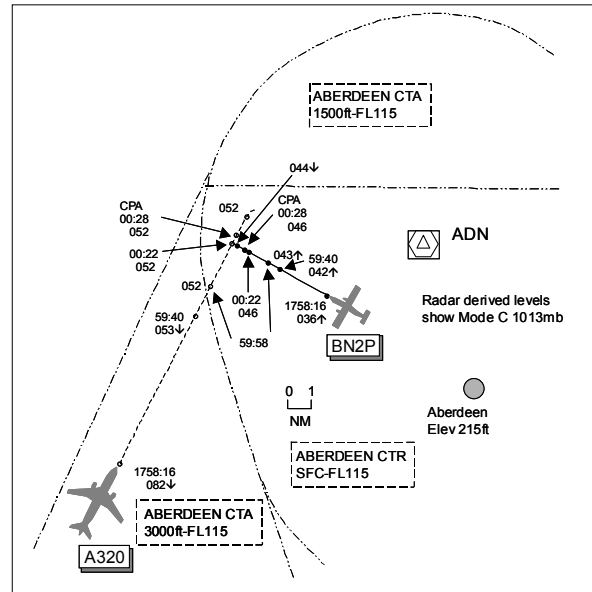
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict with an untraced light ac resolved by the F3 crew.

Degree of Risk: B.

AIRPROX REPORT NO 116/03

Date/Time: 21 Jul 1800
Position: 5718N 0231W (12nm NW Aberdeen
 - elev 215ft)
Airspace: CTR (Class: D)
Reporter: Aberdeen APR
First Ac Second Ac
Type: A320 BN2P
Operator: CAT Civ Comm
Alt/FL: 5000ft 4400ft↑
 (QNH) (QNH 1006mb)
Weather VMC CLNC VMC CLNC
Visibility: >20km 25km
Reported Separation:
 600ft V 3nm H 600ft V 1nm H
Recorded Separation:
 600ft V 0.75nm H

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

THE ABERDEEN APR reports that the ADC had requested a departure release for a BN2P to Inverness, its fps had just been placed in front of him as the ac's destination had changed. The clearance issued initially was for the ac to depart on a heading of 300° climbing to FL65. The A320 had called descending to FL90 heading 050° which he cleared for further descent to 5000ft. As the BN2P was an ambulance flight, he decided to put the ac on a tactical heading of 290° for a direct routing but he instructed the pilot to stop his climb at 4000ft which was correctly read back. The A320 was seen to level at 5000ft and he continued coordination with Lossiemouth and vectoring other ac. The BN2P was seen at 4000ft and it was estimated that the subject ac would cross over at a distance of <1nm. Again he gave vectors to other ac and when he looked back to the situation, he saw the BN2P had climbed to 4400ft as the A320 was crossing L to R at 5000ft. He asked the BN2P pilot if he was maintaining 4000ft to which the pilot replied "affirm" as the ac had descended rapidly to 4000ft. He asked the pilot if he had 'level busted' to which he said "briefly" but he had corrected rapidly back to his cleared level and he had seen the Airbus.

UKAB Note (1): The Aberdeen METAR shows EGPD1750Z 17014KT 25KM FEW018CB FEW024TCU 17/12 Q1006=

THE A320 PILOT reports flying inbound to Aberdeen IFR heading 030° at 250kt and 5000ft QNH and in receipt of an ATS from Aberdeen RADAR squawking an assigned code with Mode C. The visibility was >20km in VMC and his nav, strobe and landing lights were all switched on. Simultaneously with ATC asking another pilot if he was maintaining 4000ft, an ac appeared on TCAS climbing through 4000ft in his 2 o'clock about 5nm away; he visually acquired an Islander immediately. It was clear that even if the BN2P had continued climbing through his level, it would not have conflicted owing to its slow speed. He estimated the Islander passed 3nm clear to his R and 600ft below. TCAS generated a TA but not an RA and he believed that there had been no risk of collision.

THE BN2P PILOT reports flying solo outbound IFR from Aberdeen to Inverness heading 290° at 95kt and in receipt of an ATS from Aberdeen RADAR on 119.05MHz squawking 2611 with Mode C. The visibility was 25km in VMC and the anti-collision light was switched on; TCAS was not fitted. On boarding the ac prior to departure to Kirkwall, he was told by Ops to route straight away to Inverness.

AIRPROX REPORT No 116/03

This change occurred too late for a flight plan so he notified ATC on the RT of his intentions, taxied for departure and took off after receiving clearance. He turned onto heading 290° and on climbing through 1300ft QNH he switched on the A/P. Whilst monitoring his climb, he carried out some paperwork as he was concerned with his fuel state and a decision on where and how much to uplift had to be calculated and then passed to Ops as soon as possible. At 1000ft to go, before levelling off at his ATC cleared level of 4000ft QNH 1006mb, he called 1000ft below to himself and again with 500ft to go and on looking out of his window, he could see an A320 in his 11 o'clock position about 3-4nm away. At this point he was at the back edge of the hills just to the W of the airport with a ROC of 250fpm at 95kt. He looked down and carried out one more calculation and on looking up, when he expected to be 100-200ft below his cleared level he was in fact +200ft with the Airbus in his 1 o'clock range 1nm. He immediately disconnected the A/P and progressively pushed the control yoke forward but the ac continued to climb another 200ft (the Airbus was by now in his 2 o'clock 600ft above and moving away) before his ac started to descend rapidly, ROD 1000fpm, until he levelled at his assigned level. There were CBs and towering cumulus in the area, which was being broadcast on the Aberdeen ATIS, and he assessed the risk of collision as low.

UKAB Note (2): The BN2 operator advises that the Century A/P fitted to the subject Islander has Alt Hold mode but not Alt Capture.

ATSI reports that the BN2P departed from Aberdeen on an initial clearance climbing to FL65 on a radar heading of 300°. On establishing communications with the APR at 1754:30, the clearance was amended to stop the climb at 4000ft on QNH 1006mb; this was correctly read back. At 1756:30, the A320 pilot reported on frequency descending to FL90 on a radar heading of 050°. The APR issued a clearance to the crew of the A320, at 1757:50, to continue descent to an altitude of 5000ft, QNH 1006mb, and turn L onto heading 030°. This was all correctly read back. The APR was working traffic to the S and then looked up and saw the Mode C readout of the BN2P indicate 4400ft. He checked that the pilot was maintaining 4000ft (1800:40) as previously instructed, and the pilot confirmed this. Subsequently, an Airprox was filed. There are no apparent ATC causal factors.

CAA FLIGHT OPERATIONS INSPECTORATE (FOI) reports that the BN2P operator established that the pilot concerned had 'simply allowed himself to become distracted in the climb and had briefly taken his eye off the ball'. The pilot was subsequently counselled as to his future management of the flying task. The operator's procedures are sufficiently robust to prevent incidents of this nature, this being an isolated occurrence caused by inadequate prioritising of tasks by an individual pilot.

UKAB Note (3): Analysis of the Aberdeen Perwinnes radar recording at 1758:16 shows the A320 16nm WSW of Aberdeen tracking 030° indicating FL082 descending with the BN2P in its 1 o'clock range 11.5nm tracking 300° indicating FL036 (3400ft QNH 1006mb) climbing. Both ac continue on steady tracks, the A320 is seen descending through FL053 (5100ft QNH) at 1759:40 as the BN2P is seen climbing through FL042 (4000ft QNH); 18sec later the A320 levels at FL052 (5000ft QNH) with the BN2P in its 1-2 o'clock range 2.7nm indicating FL043 (4100ft QNH) climbing. At 1800:22 the A320 crosses 0.9nm ahead of and 600ft above the BN2P, which has just stopped climbing at FL046 (4400ft QNH). The CPA occurs 6sec later as the A320 diverges in the BN2P's 1 o'clock range 0.75nm 600ft above. Thereafter the BN2P is seen to descend twelve sec later, indicating FL044 (4200ft).

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 APR's plan to provide vertical separation until the subject acs' tracks had crossed was sound and both pilots had read back their clearances correctly. However, the BN2P pilot allowed himself to be

distracted by doing fuel calculations at a time when the priority was to fly the ac and level off at 4000ft, as the A/P did not have Alt Capture mode fitted. The outcome was that he climbed through his cleared level and into conflict with the A320 that was crossing ahead and above. This had caused the Airprox.

By the time the BN2P pilot had arrested his climb the vertical separation was 600ft when the A320 crossed from L-R 0.9nm ahead. The A320 crew had reported a TCAS TA alert but no RA warning during the encounter and, after sighting the BN2P, did not think the Islander's slow ROC was sufficiently high to cause conflicting flight paths although their estimation that the BN2P had passed 3nm clear proved to be over optimistic. The Islander pilot saw the Airbus earlier to his L well above descending and again when in his 1 o'clock position above him and diverging as he commenced recovery. The APR had noticed the BN2P's 'level bust' and had alerted the pilot to the situation. All of these safety nets worked and when combined led the Board to conclude that any risk of collision had been effectively removed.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The BN2P pilot climbed through his cleared level and into conflict with the A320.

Degree of Risk: C.

AIRPROX REPORT No 117/03

AIRPROX REPORT NO 117/03

Date/Time: 30 Jul 1024

Position: 5206 N 0225 W (5nm W of Gt Malvern)

Airspace: UKDLFS A4 (Class: G)

Reporting Ac Reported Ac

Type: Firefly Harrier GR7

Operator: HQ PTC HQ STC

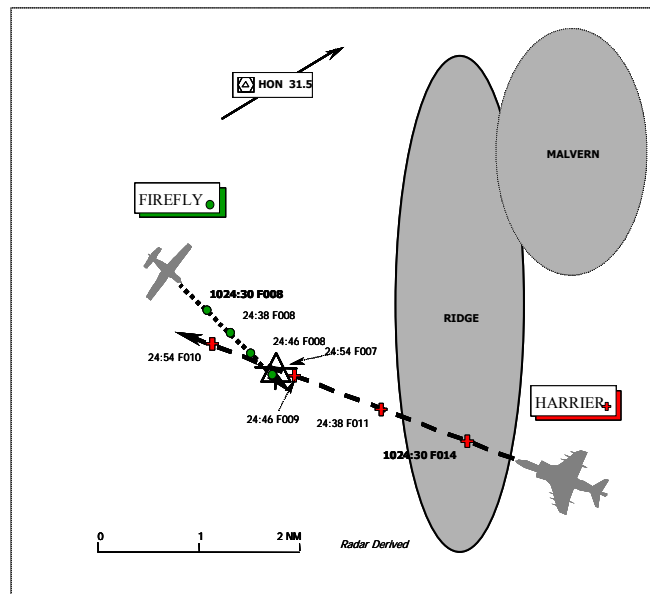
Alt/FL: 500ft 750ft
(RPS 1009 mb) (RPS)

Weather VMC VMC below cloud

Visibility: >10km 15km

Reported Separation:
100ft H 50ft V 50yds H 0 V

Recorded Separation:
Tracks crossed. Between 1 and 300ft V



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE FIREFLY PILOT reports that he was about 5nm from the Malvern Ridge flying an instructional sortie from Cosford to Barkston Heath in the UKLFS at 500ft, squawking 7001 with Mode C and HISLs switched on. While flying straight and level at 500ft MSD heading approximately 140° at 120kt, a Harrier came over the Malvern Ridge very fast, level with him in a left banked turn and passed 100ft down his left side and 50ft above on a reciprocal heading. He banked to the right so that he would become visual with him again, and saw another Harrier ½nm behind the first on a similar heading.

THE HARRIER GR7 PILOT reports that he was heading 290° at 380kt, leading a pair of Harriers participating in a promulgated Close Air Support exercise. Having egressed the target area the formation was heading approx 290° to position for re-attack with the number 2 flying 1½nm in swept battle to the starboard. He was looking right for his number 2 and on returning his lookout to the front, he saw a Firefly at a range 0.3nm in his left 10:30 flying at co-altitude and on a reciprocal heading. By the time he broke right the ac had passed approx 150ft apart co-altitude. A NOTAM was promulgated for the exercise but the HUD tape from the sortie was not available.

UKAB Note (1): The Close Air Support Exercise was notified at UKLFS NOTAM Y3801/03 28 Jul-1 Aug 1000-1530Z within a 5nm radius of 5205.79N 00226.52W warning that multiple fast-jet ac would be conducting intensive training manoeuvres and may be unable to comply with normal rules of the air. Also non-participating crews were advised to contact Sabre Control on 247.025 if they intended to transit the area. No transcript of the Sabre Control Frequency was available. This incident took place inside the area of the NOTAM.

UKAB Note (2): Both ac can be seen clearly on the radar recording with Mode C readouts. The contacts cross in almost opposite directions between radar sweeps. Prior to crossing, the Harrier was 100ft above the Firefly but on the next sweep this had increased to 300ft.

THE FIREFLY STATION comments that this was a close encounter between 2 ac operating at low level. It is a salutary reminder of the importance of maintaining an effective lookout scan, whatever other activities are required by the task.

THE HARRIER STATION comments that Close Air Support sorties are inherently high workload events as recognised by the establishment of a NOTAM warning that participating pilots would not be able to adhere to the normal high standards of lookout while conducting high energy manoeuvres. Although no aviator can be absolved from lookout responsibility, he was entitled to expect other aviators in the area to be aware of his situation while a NOTAM was in force.

HQ PTC comments that the Firefly pilot was flying a multi-leg instructional NAVEX from Cosford to Barkston Heath. He had self-briefed at Cosford and was aware of the NOTAMs. Because of its apparent size (effectively blocking the Gloucester/ Worcester/Hereford gap) he had elected not to avoid it. Nor did he attempt to contact Sabre Control. Whilst within his rights to do so, this was at best a calculated risk and it proved to be a bad one. A lesson has been learned, for this was not a collision only by chance.

HQ STC comments that there were 2 NOTAMs for the exercise, 1 low-level with a radius of 5nm and the other with a radius of 10nm; only the low-level NOTAM applied to the UKLFS. Notwithstanding this, the Harrier could legally conduct this exercise at speeds in excess of 8nm per minute and had stated its potential inability to comply with the Rules of the Air. Had the Firefly pilot taken the time to call on the promulgated frequency, not received a reply and then had the Airprox with the Harrier, then the situation would be different. Considering the Service-authorized Firefly pilot had deliberately ignored the 'strong' advice of the Service-sponsored NOTAM to contact the controlling authority (either by RT or telephone) was most unprofessional and set a poor example to civilian counterparts. Finally, the fact that someone had taken the time to promulgate their intended unusual air activity and then been subsequently ignored is disappointing.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board considered this to have been a serious and avoidable incident. The exercise conducting authority had issued timely and accurate warnings through the NOTAM system that ac would be engaged in very high-workload activities requiring high energy manoeuvres, at both low and medium level, and that participating aircrew would not be able to adopt normal standards of lookout. They also noted that sufficient contact information was given in the NOTAM for the Firefly pilot to have been able to contact the Air Ops Control Centre either in the air or preferably on the ground before take off. He, however, chose to ignore the NOTAMs and instead flew through the centre (the target area) of the promulgated airspace without contacting exercise control. Members considered that this stance was rash, showing scant regard for the circumstances and set a bad example to his student.

Members noted that the Harrier pilot first sighted the Firefly coming directly towards him from a distance he estimated as being 0.3nm (600yd which equates to just over 2sec at a closing speed of about 8nm/min). He had been concentrating his lookout over his shoulder searching for his wingman in the belief that the NOTAM had offered him a degree of protection and spotted the Firefly only on returning his eyes to the front. The Firefly pilot estimated the distance when he first sighted the Harrier to be only 100yd and did not have enough time to take any avoiding action. They both however, agreed that the miss-distance was of the order of 100ft. The Board therefore considered that it was probable that, although the Harrier pilot had sufficient time to roll and initiate a break to his right, due to his very late sighting of and close proximity to the Firefly, it is unlikely that his flightpath would have deviated much before the ac crossed. Members therefore concluded that it was only by luck that the ac had not collided and that therefore there had been an actual risk of their colliding.

AIRPROX REPORT No 117/03

While of no direct bearing to this incident, the Board noted that only a UHF frequency was published in the NOTAM. Since the majority of non-military traffic is only VHF equipped, a similar VHF contact frequency would be equally as important as a UHF one.

PART C: ASSESSMENT OF CAUSE AND RISK

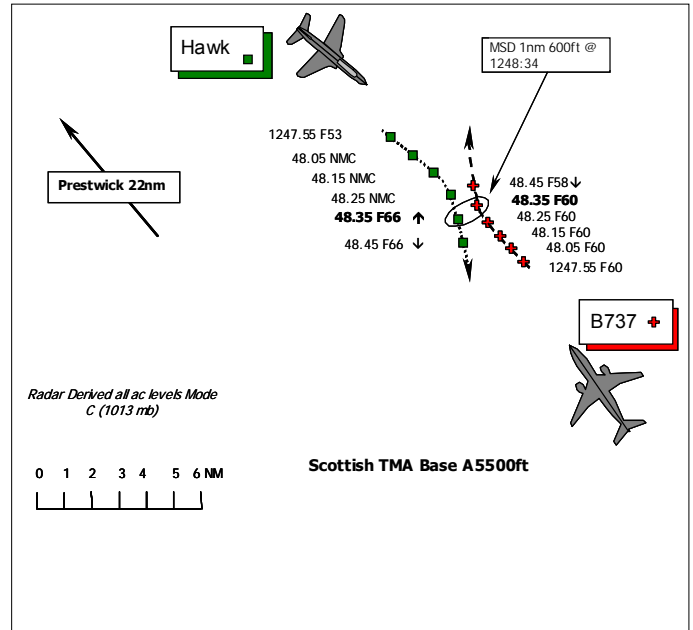
Cause: The Firefly pilot flew through the middle of a NOTAMed exercise area, without contacting the notified frequency, into conflict with the Harrier, which he saw late.

Degree of Risk: A.

AIRPROX REPORT NO 118/03

Date/Time: 30 Jul 1248
Position: 5515 N 00400 W (22nm SE Prestwick)
Airspace: Scottish TMA (Class: D Base FL55)
Reporter: Prestwick

	<u>First Ac</u>	<u>Second Ac</u>
<u>Type:</u>	B737-300	Hawk
<u>Operator:</u>	CAT	HQ STC
<u>Alt/FL:</u>	6000ft (QNH 1016 mb)	↑6500ft (RPS 1012 mb)
<u>Weather</u>	IMC	IMC
<u>Visibility:</u>	IMC	IMC
<u>Reported Separation:</u>	N/R	N/R
<u>Recorded Separation:</u>	1nm H 600ft V	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE PRESTWICK APR CONTROLLER reports that a military Hawk ac climbed into CAS of the Scottish TMA 22nm SE of Prestwick and into conflict with a B737 inbound IFR to Prestwick. Following transfer from ScACC the B737 was being radar vectored for an ILS approach to RW31. His descent was stopped at 6000ft Alt to remain inside the Scottish TMA and TI was passed on 4 low level contacts manoeuvring approx 15nm ahead up to 3000ft displaying squawks of 2632/2633/7000/7001. The B737 was turned left on to a heading of 320° to route to the W of the contacts, 2 of which at this stage were heading NE and the other 2 appeared to be joining up, he thought to follow the others to NE; he subsequently updated the TI. Shortly after the ac squawking 7000 was seen on radar ½ nm to the W of the B737 at FL66. (UKAB Note (1): Radar software converts Mode C heights to FL above transition altitude based on local QNH). The B737 pilot was given an avoiding action turn right on to a heading of 360° as the traffic passed down his left hand side. TI was again passed and the pilot reported a TCAS RA to descend, and that he was IMC. The ac squawking 7000 continued on a southerly direction descending and rejoined with others who were heading E. Following the incident he requested Scottish Military Radar to trace the ac.

THE B737-300 PILOT reports that he was at about 25nm SE of, and inbound to, Prestwick IFR and IMC and with strobes and landing lights switched on and was receiving radar vectors from Prestwick APR. While heading 330° at 230kt in the descent to 6000ft on a QNH of 1016 he was given an avoiding action turn on to 360°. Shortly after, he had a TCAS RA to descend which he complied with, descending to 5500ft before the warning cleared. He reported the descent to Prestwick and was cleared to continue with further radar vectoring inbound.

THE HAWK PILOT reports that he was flying a singleton Hawk ac in LFA 16 intercepting a formation of 3 Jaguars with a student WSO in the rear seat with HISLs selected on, squawking 7000 with Mode C. The weather at low level although showery was assessed as suitable for the exercise. He had carried out a number of intercepts on the Jaguars in the 10min preceding the Airprox, all of which were commenced from an altitude of approximately 4000ft, with a descent to low level during the final stages of the attack. The cloud structure at medium level had allowed him to maintain VMC below 5000ft amsl, albeit having to avoid scattered cloud formations that appeared to extend above. For the northernmost

AIRPROX REPORT No 118/03

leg of the Jaguars' route he descended to 2000ft agl, beneath the base of the Scottish TMA which is 5500ft amsl. He engaged the formation at position N5523 W00415 at low level, and then disengaged on a heading of 150 degrees. Shortly after the engagement he was forced to abort from low level, due to poor weather on the hilltops. Whilst fully aware of the proximity of the base of the TMA, he estimated that he would regain VMC at approximately 4000ft agl, however passing the Safety Altitude of 4000ft heading 150° at 300kt, he was still IMC in dark, thick and turbulent cloud. Before reaching the base of the TMA he considered levelling off, but decided to maintain his climb in order to minimise the risk of losing control of the ac whilst carrying out a disorientating manoeuvre in very poor weather conditions. He regained VMC at 6000ft, and continued to head 150 deg in order to clear the TMA, levelling off at 6500ft. He estimated that he had cleared the TMA before he had time to squawk emergency and call Scottish Military on Guard. Shortly after clearing the TMA he descended back to low level and continued the sortie. While at 6500ft he maintained VMC and did not see any other ac.

STATION COMMENTS it is clear from the Hawk pilot's statement that a transgression into CAS occurred. Furthermore, it is highly likely that such an action would alert TCAS and generate an avoidance manoeuvre. The key issues are: why did the transgression occur and were the subsequent actions correct?

Given his assessment of the weather at the time of the incident, it is understandable that a low-level abort was preferred over a manoeuvre at low-level in poor weather and high terrain. Clearly, the assessment of the weather was over-optimistic, and a greater safety margin should have been applied; the unit concerned has already taken corrective action. That said, having found himself in an unexpectedly disorientating situation, the pilot acted correctly in continuing to climb and 'fly the ac'.

Turning to his subsequent actions on finding himself in clear conditions inside CAS, we need to establish the relative merits of selecting an emergency squawk or concentrating on clearing his flightpath and expeditiously returning to Class G airspace. The pilot elected to take the latter course of action. Given the time available and envisaged coordination and communication difficulties, especially those inherent with the Hawk's avionics fit, his decision may have been justified.

ATSI reports that there were no apparent ATC causal factors. The B737 was at 6000ft inside Class D CAS where the base is 5500ft. TI was passed to the B737 about the traffic manoeuvring ahead and below 3000ft. The Lowther Hill Radar recording shows one of the unknown ac suddenly appearing at FL63, in an area where other SSR labels were overlapping. Shortly afterwards, an appropriate avoiding action right turn was issued by the Prestwick APR Controller, as the unknown was showing FL65 about 2nm away. Vertical separation was 600ft as the ac passed.

UKAB Note (2): The recording of the Glasgow Radar shows the Hawk return appearing slightly earlier than the Lowther Hill Radar at 1257:53 at FL53 in the 12 o'clock of the B737 at about 7nm. The combined closing speed of the ac was 530kt or about 1nm every 7sec. The CPA occurred at 1248.34 with the Hawk passing 1nm SW of the B737 on an opposite heading 600ft above his Alt. Although imprecise due to the lack of accurate height information of the Hawk it is probable that it passed through the B737's Alt, just left of its 12 o'clock, at about 1248:16 when the ac would have been separated by a little over 3nm.

HQ STC comments that the pilot of the Hawk was faced with a serious dilemma. Should he take his chances amongst the high ground in IMC or take a 'big-sky theory' gamble within the Scottish TMA. The fact that he had self-induced this pressure through over-optimistic decision-making has been thoroughly covered. Apart from flying his ac the requirement to squawk emergency (one switch selection on the Hawk) should have been his primary aim once above safety altitude. At the very least he should have remained predictable and spoken to Scottish Military to explain his transgression and not just continued his sortie.

HQ STC commends the prompt action of the Prestwick APR Controller by vectoring the B737 that almost certainly helped avert a very close encounter. Also, the value of TCAS has again been proven in this incident.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Military Board members considered in the first instance that pilots with sufficient experience to gain an 'aggressor' qualification should be able to exercise better judgement in assessing the weather and not get themselves into situations where escape options are severely restricted, as this pilot did.

Having weather aborted, there was insufficient space between the Safety Alt and the base of CAS to allow him to arrest his rate of climb safely without penetrating the TMA. That said, he should have, as is taught for and practised in, the military Instrument Rating Test, squawked emergency and contacted ATC as soon as it was safe to do so. By not doing so, he compromised the safety of his own ac and that of the B737 by not immediately drawing the attention of the controller to his situation and allowing the latter to take early action to deconflict the two ac. As it was, the controller spotted the Hawk's intrusion into CAS and issued avoiding action very quickly, but due to its rate of climb, the Hawk passed through the B737's level (in its 12 to 11 o'clock at a range calculated to be approx 4nm) and continued its climb to 600ft above the B737's alt, before descending behind it. All of this was done with the Hawk pilot not being aware of the B737's position and while flying in IMC.

Owing to the lateral separation between the ac when the Hawk flew on an opposing track through the B737's alt and because it remained 600ft above until after they had crossed, the Board concluded that there had not been a risk of their colliding. However, separation had been below that required in CAS, to the extent that there had been compromise to the safety of both ac.

The Board concurred HQ STC's commendation of the prompt action of the Prestwick APP Controller.

Conversely Members found some of the comments put forward by the Hawk pilot's Station, in supporting the pilot's chosen course of action, as disappointing. They accepted however, the HQ STC representative's assurance that Strike Command did not in any way condone such transgressions into CAS and that the station concerned had been reminded that they cannot be excused and directed crews to be informed accordingly.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: While conducting a weather abort from low level, the Hawk pilot climbed into CAS in IMC into conflict with the B737, which he did not see.

Degree of Risk: B.

AIRPROX REPORT No 119/03

AIRPROX REPORT NO 119/03

Date/Time: 4 Aug 1622

Position: 5319N 0256W (3nm SW Liverpool - elev 81 ft)

Airspace: MACC CTA (Class: D)

Reporter: Liverpool APR

First Ac Second Ac

Type: BE1900 B737

Operator: CAT CAT

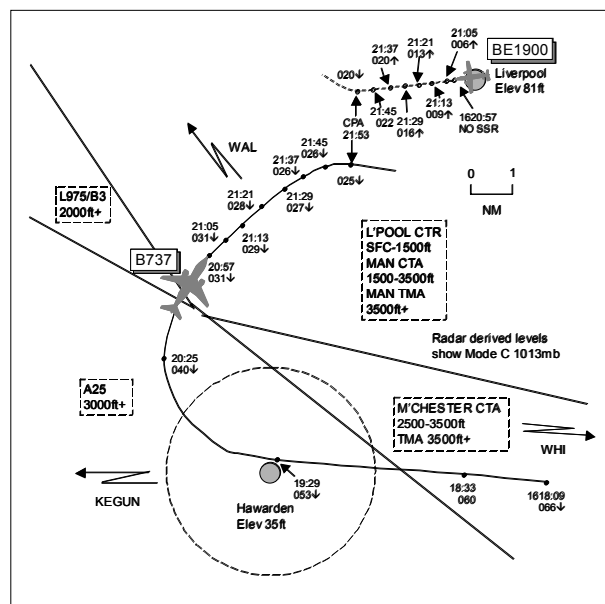
Alt/FL: 2000↑ ↓2500ft
(QNH 1023mb) (QNH 1023mb)

Weather VMC NK VMC NK

Visibility: >10km NK

Reported Separation:
500-1000ft V NK HNR

Recorded Separation:
500ft V 1.7nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE LIVERPOOL APR reports that MACC TMA called to coordinate an inbound B737 and she told them that there was a WAL2T SID to depart and that she would separate the ac. The MACC controller said that if she could allocate a lower level, they would turn the B737 downwind LH to resolve the conflict; she allocated 2500ft altitude. The ADC then requested 2 further releases on WAL2T departures (the 1st one being the BE1900), which she approved, as she assumed the inbound B737 traffic would be positioned downwind LH. The B737 called on frequency when it was 2nm SW of the airfield, level at 2500ft on a heading of 050°, which was in direct conflict with the BE1900 just airborne approaching 2000ft climbing. The TMA controller levelled the BE1900 at 2000ft and she turned the B737 onto heading 100°, both crews reported that they could see each other.

THE MACC WEST/IOM COORDINATOR reports that Liverpool was using RW27 with 2 Wallasey departures pending and there was a Hawarden departure released for a MONTY4 SID. The B737 was inbound to Liverpool through WHI routing to KEGUN. In order to expedite the traffic flow, he asked the Liverpool APR for a lower level and suggested positioning the B737 for a LB join for RW27. He informed his radar controller of the coordination and, when the B737 was clear of the Hawarden outbound, it was descended and turned towards LB and was transferred to the Liverpool frequency.

THE MACC WEST/IOM RADAR CONTROLLER reports a Hawarden outbound called on frequency and was instructed to maintain 4000ft and the B737 was told to level at FL60. He was informed by the Coordinator that 2500ft had been obtained from Liverpool and that the B737 was to be routed towards a base leg position on a suggested heading of 050°. He told the B737 crew of his intentions, with regards to the Hawarden traffic beneath and to expect a tight turn towards LB for RW27. After the B737 passed the Hawarden traffic, he turned it R onto 055°, descended it to 2500ft and transferred it to Liverpool. About a couple of minutes later, the BE1900 became airborne and he commented that it did not look good against the B737 working Liverpool which was descending through 3200ft still on the previously assigned heading. To his surprise, the BE1900 pilot called on his frequency so he told him to stop his climb at 2000ft and gave an avoiding action turn onto 310°. Although the Beech pilot reported that the traffic was in sight he confirmed its relative position.

THE BE1900 PILOT reports heading 270° at 140kt outbound IFR from Liverpool and in receipt of an ATS from MACC on 128.05MHz squawking 7427 with Mode C; TCAS 1 was fitted. After being cleared for a SID without any extra altitude restrictions, he checked in with MACC ATC climbing through 2000ft but he was instructed to level off. A few moments later he was told to take evasive action by turning onto heading 320°, he thought, and he saw a B737 passing to his L about 500-1000ft above in a descending R turn whilst TCAS gave a TA warning. He assessed the risk of collision as medium.

THE B737 PILOT reports heading 050° at 250kt inbound IFR to Liverpool squawking an assigned code with Mode C. The incident occurred during the latter stages of a descent to 2500ft altitude on a radar heading of 050° working MACC on 128.05MHz. His track appeared normal for his ac to pass through the Liverpool O/H and then to join RH for RW27 although he had been told previously that there was a possibility of flying a R turn to join for a LH cct. Following MACC ATC telling them to call Liverpool RADAR on an unfamiliar frequency of 118.45MHz, which both he and his FO (PNF) remarked on, the FO read back the ATC instruction and changed frequency. The FO commented that he had used the alternative frequency the previous evening. Upon calling on this frequency the Liverpool controller answered but immediately asked them to call on the usual 119.85MHZ, which they did. Straight away they were instructed to turn R onto a more easterly heading and reference was made to departing traffic from RW27 which he observed on TCAS and subsequently saw visually. There were no TCAS warnings and he did not think the traffic looked particularly close.

ATSI reports that the Liverpool APR described her workload, at the time of the incident, as low, whereas both the MACC W/IOM Sector Controllers said that they had been moderately busy.

The B737 was inbound to Liverpool on a KEGUN 1A STAR and its crew established communication with the MACC W/IOM Sector at 1615, reporting descending to FL80 on a radar heading of 275°. The Radar Controller cleared the ac to descend to FL60, initially on the heading but, subsequently, on its own navigation to KEGUN. This clearance was in accordance with agreed Liverpool/MACC procedures, whereby the W Coordinator allocates the Minimum Stack Level (MSL) available at KEGUN. This level is based on the TMA MSL, i.e. the flight level equivalent to 6000ft on the Manchester QNH. Meanwhile, in accordance with local agreements, the W Coordinator telephoned Liverpool to arrange a formal release for the flight. The MACC MATS Part 2, Pages WES48-50, states the procedures for Liverpool inbounds. Of relevance to this incident are: *“Liverpool Approach will allocate, whenever possible, a lower altitude and the ac is given appropriate routeing instructions. MACC will descend the ac and transfer as agreed. Normally in the event of there being no conflicting traffic affecting the inbound, Liverpool can be expected to allocate either 4000ft or 5000ft altitude. When Runway 27 is in use (as on this occasion) all ac from the southeast (WHI) and KEGUN directions will be positioned for a right hand circuit for Runway 27 unless specifically agreed in the release from MACC West. Liverpool Approach are responsible for separating outbounds against inbounds when an inbound has been released and transferred or if not in contact, an altitude below minimum stack has been agreed between MACC and Liverpool Approach.”*

When the W Coordinator made the telephone call to Liverpool Approach about the B737's release, the flight was heading W, SE of Liverpool airport. He asked the Liverpool APR *“how'd you like him down”* adding that the Manchester outbounds would be kept clear. The APR explained that there was an ac about to depart on a Wallasey (WAL) SID from RW27 and offered to accept the B737 on a left base. (The RW27 WAL SID is to climb straight ahead to intercept the WAL VOR R121 to WAL VOR climbing to 4000ft). The W Coordinator said that he would call Liverpool back shortly, explaining that he wanted to check whether there were any Manchester departures that could conflict with this plan. However, despite there being a number of Honiley departures, whose routeing is to the W and S of Manchester, in potential conflict, the Coordinator telephoned Liverpool to offer the B737 descending to 2500ft, when clear of a Hawarden departure routeing southbound. Once the Liverpool APR agreed to this altitude, the Coordinator said *“We'll turn him for a left we'll turn him all the way back round”*, meaning for a base leg, although the Liverpool APR said that she interpreted this as positioning for a downwind heading. The Coordinator added that the ac would need to be kept low and as tight as possible to avoid

AIRPROX REPORT No 119/03

the Honiley departures climbing out of Manchester. The APR commented that it would probably go visual. Consequently, it was agreed that the B737 would be transferred descending to 2500ft, with the flight being released passing 5000ft and the WAL departure, which was just airborne, would be transferred directly to MACC. No mention was made about any further Liverpool departures on WAL SIDs. The radar, timed at 1618:09, as the co-ordination was being concluded, shows the B737 approximately 9nm S of Liverpool Airport, heading W and passing FL66.

The Coordinator said that he had not consulted the Radar Controller either before, or during, the co-ordination with Liverpool. Consequently, the first the MACC Radar Controller knew about the terms of the agreement was when the Coordinator informed him of the B737's release, descending to 2500ft, for a LB, on a suggested heading of 050°. Accordingly, at 1619, the flight was given descent to 2500ft, with the instruction to continue on its heading. The pilot was warned to expect a tight R turn for a LB and shortly afterwards, at 1619:28, he was instructed to turn R heading 055°. The radar reveals that the B737 was passing FL53 at the time, about 9.5nm SSW of the airport. At 1620:25, when the B737 was passing FL40 and just about to turn through a northerly heading, 10nm SW of Liverpool Airport, it was transferred to Liverpool Approach. In the event, the B737 was transferred to the 'wrong' frequency, as Liverpool had not updated the frequency in use.

Meanwhile, after the B737 had been co-ordinated descending to 2500ft, Liverpool Tower requested releases from the APR for two ac on WAL SIDs, the first of which was the BE1900. Approval was issued for both flights. At 1620:35, the B737 called the 'wrong' Liverpool frequency. The pilot was informed of the 'correct' frequency by an off-duty controller who had heard the call and communication was established with the APR, some thirty seconds after the initial call to Liverpool was made. Just before the ac called the correct frequency, Tower advised that the BE1900 was airborne and the APR instructed that the flight should be transferred direct to Manchester. At the time (1621:10), the B737 was 7.5nm SW of the airport and establishing on the 055° heading. On contacting Liverpool, the pilot reported heading 055° and descending to 2500ft. He was instructed (1621:20) to turn R heading 110°, to take it away from the departure, but there was no urgency in the delivery of the instruction. This was followed by information about *"traffic just departing two seven you are turning away from it now climbing through your level"*. The pilot reported having the traffic on TCAS. Radar recordings reveal that the two ac were 2.8nm apart at the time (1621:29).

As the B737 was receiving TI about the BE1900 from Liverpool, the latter flight called Manchester, reporting 2000ft and climbing to 4000ft. [UKAB Note (1): 2000ft altitude with a QNH of 1023mb is equivalent to FL017]. The MACC Radar Controller said that he was surprised when the flight contacted him as he thought that Liverpool would be in communication with it, in view of the proximity of the B737. He instructed the BE1900 to stop its climb at 2000ft and then issued an 'avoiding action' R turn heading 310°. The pilot reported sighting the traffic, at which point information was passed on an ac passing to the S by approximately 3nm. The radar recording of the event shows that the two ac passed abeam each other at 1621:53 by 1.7nm, when the B737 was 500ft above the BE1900.

The incident occurred as a direct result of the co-ordination agreed between the Liverpool APR and the MACC W Coordinator. The 3 controllers involved later explained their respective actions in response to this co-ordination. The Coordinator reasoned that, if the B737 had been turned onto a heading of 050° and been given descent to 2500ft, at the time of the co-ordination, it would have been positioned onto LB for RW27, well clear of any Liverpool departing traffic. The problem arose when the MACC Radar Controller was unable to carry out the plan straight away, mainly because of the Hawarden outbound referred to earlier, which restricted the early descent of the B737. For this reason he had to delay the ac's R turn to ensure that it would be at a low enough altitude, when to the SE of Liverpool Airport, so as not to compromise the Manchester Honiley outbounds. The MACC Radar Controller transferred the B737 to Liverpool on the heading 055°, assuming that the Liverpool APR would be separating the departures from it vertically and would have time to turn it downwind. The Liverpool APR believed that the agreed co-ordination was for the B737 to be placed on a heading downwind LH for RW27, clear of

the Liverpool departure path. Consequently, she instructed the BE1900 to be transferred direct from Tower to MACC.

Following an Airprox, which occurred on 6 March 2000 between an ac inbound to, and an outbound from, Liverpool, SRG (ATSI) made a recommendation, which was endorsed by UKAB, "*That the CAA, through DAP, considers with urgency examination of the new procedures proposed for Manchester and Liverpool*". As a result of this recommendation, new procedures were introduced on 15 May 2003 in order to help deconflict Liverpool traffic. In effect this introduced standard routings to KEGUN, with ac being vectored RH downwind for RW27. However, the option was available for descent to 2500ft and a LH cct following co-ordination between Liverpool and MACC. It was this latter aspect which resulted in this Airprox. Although it would not be reasonable to preclude the use of this option to the standard procedures altogether, it is considered necessary to make the following recommendation.

ATSI RECOMMENDATION

It is recommended that the option for allowing the allocation of an altitude below the Minimum Stack Level, following co-ordination between MACC and Liverpool, should be reviewed by the Management of the two ATC Units, to determine whether its use should be further restricted.

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 comment that the Airprox occurred as a direct result of the coordination agreed between Liverpool and MACC. Both parties came away with different expectations from the exchange. The MACC Coordinator had agreed a course of action of descending the B737 to 2500ft and to position the ac onto LB on a suggested heading of 050° to remain clear of the Liverpool outbounds, although the words used were far from explicit. However, this was not implemented immediately by the MACC Radar Controller, owing to Hawarden outbound traffic. The Coordinator did not update the plan, whilst for his part, the Radar Controller was unaware of the full plan; he only knew the suggested heading and level from his Coordinator which did not achieve the desired cct position expected by the Liverpool APR (S of Liverpool LH downwind for RW27), a position that would have kept it clear of the WAL SIDs. The Board agreed that the agreed coordination between the MACC IOM/W Coordinator and Liverpool APR was not implemented by the MACC Sector team and this had caused the Airprox. Members thought the ATSI recommendation was eminently sensible.

When the B737 called on the correct Liverpool frequency, the APR turned it to the R and passed TI on the departing BE1900, although it was disappointing to see that 'avoiding action' phraseology was not used. Having noticed the developing confliction, the MACC Radar Controller had been surprised when the BE1900 had called him on departure. Commendably, he reacted immediately by stopping its climb and issuing an avoiding action R turn away from the B737 and passing TI. Both crews visually acquired each other during their manoeuvring, with the Beech crew receiving a TCAS TA after commencing avoiding action. The initiatives taken by all parties combined with the geometry of the incident persuaded the Board that any risk of collision had been effectively removed.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The agreed coordination between the MACC IOM/W Coordinator and the Liverpool APR was not implemented by the MACC Sector team.

Degree of Risk: C.

AIRPROX REPORT No 120/03

AIRPROX REPORT NO 120/03

Date/Time: 6 Aug 0832

Position: 5132N 0012E (6nm ENE London City - elev 17ft)

Airspace: FIR (Class: G)

First Ac Second Ac

Type: BA46 Cirrus SR22

Operator: CAT Civ Pte

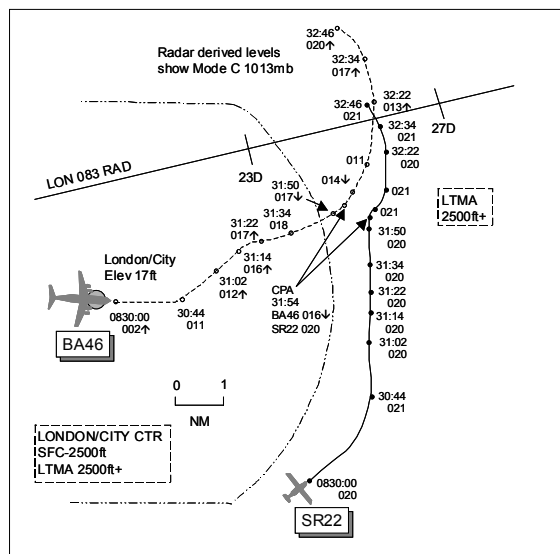
Alt/FL: 2200ft↑ 2300ft
(QNH 1020mb) (QNH 1020mb)

Weather VMC CLNC VMC CLNC

Visibility: >10km >10km

Reported Separation:
NR 150ft V 400m H

Recorded Separation:
400ft V 0.6nm H



BOTH PILOTS FILED

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BA46 PILOT reports heading 075° at 220kt outbound IFR from London City and he was in receipt of a RCS from Thames RADAR on 132.7MHz squawking 2215 with Mode C. The visibility was >10km in clear sky VMC and his nav and strobe lights were switched on. Initially flying into sun following a LYD3U SID, he was seeking to establish on the LON083 radial. On climbing through 2200ft altitude, he thought, and after contacting Thames Radar, he was told to turn sharp L onto heading 340° to avoid unidentified traffic. Simultaneously, TCAS gave an RA 'descend', demanded ROD 2100-2500fpm, which he followed whilst executing the turn and informing ATC of the TCAS descent. During this manoeuvre, neither the Capt (PF) nor FO (PNF) saw the conflicting traffic. However, a 'terrain terrain' warning followed by a GPWS 'pull-up' alert was received, the ac was levelled at 1450ft QNH and then he recovered the ac to the assigned altitude of 3000ft. Workload had been high during the departure phase of the flight and he assessed the risk of collision as high.

THE CIRRUS SR22 PILOT reports heading 360° at 160kt en route VFR from Redhill to Elstree and in receipt of a FIS from Thames RADAR on 132.7MHz squawking an assigned code with Mode C. TCAS 1 was fitted. The visibility was >10km in clear sky VMC and his strobe and landing lights were switched on. Passing to the E of the London City CTR he heard ATC issue avoiding action instructions and TI to another ac and, on looking to his 9 o'clock position, he saw a BA46 climbing on a crossing track L to R heading 090°. As the BA46 began to turn L he turned R until it had passed about 150ft below and 400m clear on his LHS, there had been about 10-15sec between his initial sighting and the BA46 passing at its closest point. He believed that during the encounter he had received a TCAS TA alert. Had no avoiding action been taken, he assessed the risk of collision would have been high but owing to the actions taken by Thames Radar, he thought the risk had been medium to low.

THE THAMES RADAR CONTROLLER reports the weather was CAVOK with an OAT of +26°C with a light easterly surface wind. The SR22 was routing S to N to the E of the London City CTR at 2400ft under a FIS. The BA46 departed London City at 0830 following a LYD3U SID but was observed to be climbing slowly and in a more easterly direction than the SID profile which put it in direct conflict with the SR22. Using the priority line he called City Tower and instructed them to turn the BA46 away but simultaneously he heard the BA46 pilot calling on his frequency. He immediately gave the BA46 an

avoiding action L turn and passed TI on the SR22. The BA46 pilot complied with the instruction and informed him of a TCAS descent to 1500ft. He then passed TI to the SR22 pilot who told him that he had the traffic on TCAS, he thought, but it appeared to take no action. The BA46 then initiated its own climb to 3000ft after the conflict was resolved.

THE LONDON CITY AERODROME CONTROLLER reports the BA46 started engines at 0820 having called for clearance 15min earlier. The clearance was issued for a LYD3U SID and after being corrected on the squawk, the readback was confirmed as correct; the airport information had been passed prior to start. A departure release was requested at 0825 which was agreed subject to the BA46 departing 3min behind another ac, and the BA46 departed RW10 at 0830. After checking that the ac's squawk was correct and that it had code-c/s converted, he transferred the BA46 to Thames Radar on 132.7MHz which occurred approx 40sec after departure. About 60sec later, Thames Radar called on the priority line about the BA46 but its pilot simultaneously called on the Thames frequency. He was subsequently given avoiding action by the Thames controller against traffic working them in Class G airspace 6.5nm ENE of London City. He commented that the surface wind had been easterly about 5kt but traffic landing on RW10 at 0847 reported a 20kt tailwind until short final. Another ac lining up for departure, which had landed at 0811, then reported having experienced the same 20kt tailwind when on their earlier approach.

UKAB Note (1): Even at 0832, the temperature was much higher than normal. Met Office archive data shows the London/City METAR as EGLC 0820Z 09007KT CAVOK 25/18 Q1020=. A weather aftercast could not find anything that would positively suggest a westerly wind although London was situated under the edge of a col feature which would have given a 2000ft wind of 150° 15-20KT.

ATSI reports that the SR22 established communications with Thames Radar at 0824. The pilot reported en route from Redhill to Elstree at 2300ft and requested a crossing clearance of the London City CTR. The ac was allocated a squawk and placed under a FIS. At 0827:50, when the ac was approximately 5nm SSW of London City Airport, the Thames Radar controller advised that he would be unable to issue a transit clearance and so the pilot should route around the CTR.

At 0830, the BA46 departed from London City RW10 on a LYD 3U SID which requires the ac to climb straight ahead to 1 DME and then turn L to track 020°(M) to intercept and follow the LON VOR 083 radial to LON DME 31. The profile of this SID requires the ac to cross LON 23 DME at 3000ft, LON 27 DME at 3000ft and LON 31 DME at 4000ft. Approximately 40sec after departure the BA46 was transferred to the Thames Radar frequency, however, a period of some 55sec elapsed before the crew called on the new frequency.

Analysis of the radar recording at 0830:44 shows the BA46 commencing a L turn approximately 2nm E of London City, passing 1300ft QNH 1020mb (FL011). At this time the SR22 is outside of the CTR, 6.5nm ESE of the airport maintaining 2300ft QNH (FL021). At 0831:14, the BA46 can be seen commencing a right turn as it is passing 1800ft (FL016). The radar recording shows the ac to be S of the LON VOR 083 radial and is apparently tracking along the LON VOR 087 radial instead. The Thames Radar controller, having seen the developing situation between the BA46 and the SR22 outside of the CTR, called the London City ADC on the priority line. His intention was to instruct the ADC to issue a turn instruction to the BA46. However, whilst the phone was ringing, at 0831:20, the BA46 crew called on the Thames frequency. The controller immediately transmitted "*BA46 c/s roger avoiding action turn left heading three four zero traffic outside controlled airspace east one o'clock two thousand two hundred feet*". The radar recording shows that the BA46 left CAS at 0831:40, while still at 2000ft (FL018). The two subject ac continued to close and the controller instructed the BA46 crew to make a "*.....hard left turn heading three four zero...*", by which time (0831:50) the two ac were 0.8nm and 300ft apart. The BA46 crew responded by stating that they had a TCAS RA and were descending. STCA had activated and gone straight to 'high severity' at 0831:26, and changed to 'low severity' at 0831:58, before ceasing at 0832:05. The Thames Radar controller also passed traffic information to the SR22 pilot, who reported visual with the BA46.

AIRPROX REPORT No 120/03

[UKAB Note (2): The CPA occurs 0831:54, the BA46 having commenced descent and passing 0.6nm to the NW of and 400ft below the SR22.]

The BA46 descended to an indicated altitude of 1300ft (FL011) and then the Thames Radar controller instructed the crew, at 0832:20, to continue their L turn onto a heading of 180°. The crew acknowledged this and informed the controller that they were now climbing to 3000ft. The BA46 was now 1.1nm due N of the SR22, with both ac tracking approximately 350°. As the BA46 climbed, STCA activated and, once again, went straight to 'high severity' at 0832:34 as the BA46 was passing 1900ft (FL017) and the SR22 maintaining 2300ft (FL021). The controller requested the pilot of the SR22 to descend to 2000ft, "...against the one four six who's climbing." Although the instruction to the BA46 crew to turn left onto 180° was issued at 0832:20, the radar recording shows no appreciable change in track until 0832:46, by which time the BA46 is climbing through 2200ft (FL020) 1.7nm ahead of the SR22, which is still at 2300ft (FL021).

The BA46 re-entered controlled airspace at 0833:00, as it climbed through 2500ft into the London TMA.

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 radar replay showed the BA46 initially turning L after departure but then it turned R and flew on a more easterly track not on the LON VOR 083 radial. As no reason/mention had been made of this in the BA46 pilot's report, it was open to conjecture as to why this had happened. A mis-selection of the required radial may have occurred or the ac may have been subject to poor VOR signal reception. A possible tail wind was another factor although this weather element had gone uncorroborated by the Met Office. However, for whatever reason, it was clear that the BA46 crew did not comply with the LYD3U SID but left CAS and flew into conflict with the Cirrus SR22. This had caused the Airprox.

Turning their attention to assessing the risk of ac collision, members noted that the Thames Radar Controller had noticed the BA46's slow climb and track deviation and had proactively tried to resolve the conflict, through the London/City ADC, as the BA46 pilot had not called on his frequency. When the BA46 pilot did call, the Thames controller issued an immediate 'avoiding action' L turn away from the SR22 and passed TI. Although the BA46 crew were slow in making contact with Thames Radar, this aspect was not considered to be a part cause of the incident, but it did have the effect of delaying the resolution of the conflict. The SR22 pilot had heard the 'avoiding action' transmission, seen the subject ac to his L and, having commenced a R turn to avoid it, received appropriate TI. Simultaneously with the airliner crew receiving their avoiding action from ATC, TCAS gave an RA "*descend*" command, which was followed promptly and robustly. This took the BA46 0.6nm away from and 400ft below the SR22 at the CPA. What happened next surprised airline pilots on the Board. Descending in response to the TCAS RA had induced a GPWS "pull-up" alert on the BA46 flight deck. Members conjectured that a degree of over-enthusiastic control may have played a part but whatever the reason, the climb that followed to avoid the 'ground warning' led the BA46 straight back into conflict with the SR22. It was unsurprising that the airliner's crew remained unsighted on the smaller ac since the latter was by that stage a mile away in their 6 o'clock position. While some Board members thought this unusual chain of events had rendered uncertain the safety of the airliner, more believed otherwise. While elements of what took place were singularly untidy, sufficient safety net factors had interjected to persuade the Board that any risk of collision had been effectively removed.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The BA46 crew did not comply with the LYD3U SID but left CAS and flew into conflict with the Cirrus SR22.

Degree of Risk: C.

Contributory Factors: The BA46 crew was slow to contact Thames Radar.

AIRPROX REPORT No 121/03

AIRPROX REPORT NO 121/03

Date/Time: 6 Aug 1202

Position: 5048N 0140W (6.5nm FIN APP
RW26 Bournemouth - elev 36 ft)

Airspace: CTR (Class: D)

Reporter: Bournemouth APR

First Ac Second Ac

Type: BE76 PA46 Malibu

Operator: Civ Trg Civ Pte

Alt/FL: 1600ft 2000ft

(QNH 1021mb) (QNH)

Weather VMC HZ VMC NK

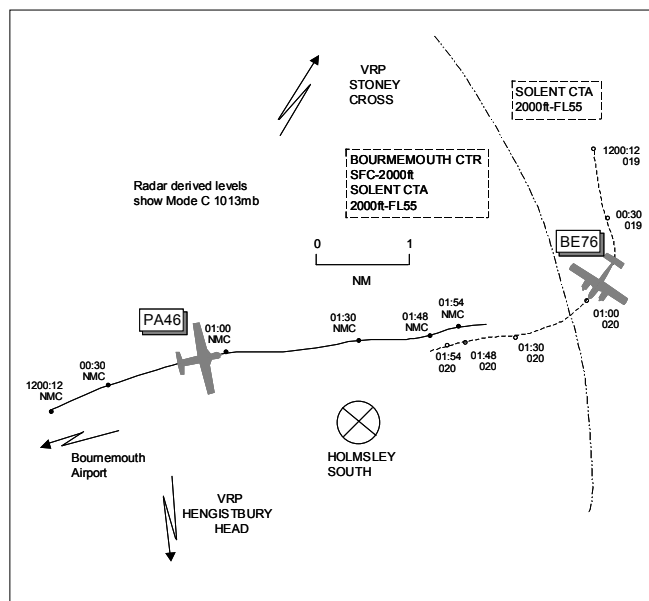
Visibility: 6km >10km

Reported Separation:

20ft V 200ft H 100ft V 300ft H

Recorded Separation:

0.2nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BOURNEMOUTH APR reports that he was vectoring an IFR BE76 onto the final approach track (FAT) for RW26. As the ac established on the NDB procedure, a 7000 squawk appeared in its 12 o'clock range 1nm flying in the opposite direction. He passed TI to the BE76 pilot who visually acquired the ac passing <0.5nm away from them. He was then able to identify the ac as the PA46 that had been instructed to leave CAS to the NE and avoid the RW26 FAT. The PA46 pilot later admitted that he was tracking direct to GWC VOR and was given further instructions to prevent him infringing the Southampton CTR.

UKAB Note (1): Met Office archive data shows the Bournemouth METAR as EGH1150Z 29006KT 7000 SKC 26/21 Q1021=

THE BE76 PILOT reports flying as an examiner during a commercial Instrument Rating renewal/revalidation test flight from Bournemouth and in receipt of a RCS from Bournemouth APPROACH on 119.47MHz squawking 1741 with Mode C. The visibility was 6km in hazy VMC, the ac was coloured white/maroon and the landing and strobe lights were switched on. The incident occurred during an ac's changeover from Tower to the Approach frequency as a PA46, whose pilot appeared to speak very poor English, was attempting to leave the Bournemouth Zone. The PA46's pilot had been told to fly NE after take-off from RW26 but had turned onto E, which, combined with a N wind, had caused the ac to drift onto the FAT. Whilst she was heading 263° at 100kt and 1600ft altitude, she thought, QNH 1021mb, the APR told her of traffic in her 1230 position which may have been a spurious radar blip. When she looked up - she had been watching the applicant's NDB tracking - she saw a Piper Malibu coloured white/navy about a 0.25nm away. She took no avoiding action as the PA46 was about 20ft below and was going to pass down her RHS side, which it did by an estimated 200ft. She assessed the risk of collision as medium although she believed it would have been high if she had been flying a larger ac.

THE PA46 PILOT reports flying solo on departure from Bournemouth to Belgium and in receipt of an ATS from Bournemouth Approach squawking an assigned code with Mode C, he thought. He had previously flown in 3 days earlier for the ac to undergo maintenance during which its fuel senders were replaced, but the LH unit had not been calibrated and he was told to return at a later date to resolve this problem. He departed RW26 and turned to the R onto his required track, he could not remember

hearing ATC issue any specific heading. The controller spoke to him at a very fast rate and the English language used was different from what he was used to in Europe. During the departure phase the fuel warning system alarm suddenly activated which caused him concern and he commenced trying to check/resolve the problem. Level at 2000ft QNH, he thought, at 150kt he saw a BE76 in his 1-2 o'clock range 500ft about 100ft above flying in the opposite direction. He turned immediately to the L to avoid and it was seen to pass 300ft to his R about 100ft above.

ATSI reports that at the time of the Airprox, both ac were in communication with the Bournemouth APR and he reported both his workload and the traffic loading as 'light'. The relevant ATC equipment was all reported to have been serviceable at the time, however, the performance of the radar equipment is discussed in the ATS analysis.

The BE76 was in communication with the APR and being positioned downwind RH, at 2000ft, to be radar vectored onto the FAT for an NDB approach to RW26 at Bournemouth. The PA46 departed from RW26 and, at 1159:20, following transfer from the tower, the pilot established communication with the APR and was instructed to report leaving the CTR. The APR continued to vector the BE76 around the circuit and, at 1200:35, the pilot was instructed to report established on the inbound QDM. A short time later, at 1201:30, the APR transmitted "*BE76 c/s it may be erroneous but there's traffic twelve o'clock range of one mile opposite direction no height or type information*". No avoiding action was offered. The pilot of the BE76 confirmed that she could see an ac, which continued to pass down the BE76's RHS at a distance of 0.2nm at the closest point. The APR subsequently ascertained that the other ac involved was the PA46.

The PA46 had requested start up and taxi clearance at 1130:40, its pilot advised that he wished to make a VFR flight to Kortrijk (EBKT). The taxi clearance was issued by the GMC and correctly read back. The GMC called the ac again, at 1133:00, and transmitted "*PA46 c/s do you wish to depart to the northeast initially or the southeast to keep you clear of the final approach*", but there was no response. The GMC attempted to contact the ac numerous times without success, until finally, at 1151:30, - almost 20 minutes later - two-way communications were restored. At 1152:10 the GMC again asked whether the PA46 preferred to depart to the NE or SE, but this time no mention of avoiding the final approach track was made.

[UKAB Note (2): The GMC frequency RT transcript at 1152:20 reveals the PA46 pilot replying "*Southeast er PA46 c/s*". The GMC responds "*Sorry was that northeast*" to which the PA46 pilot answers "*Er I want to fly to the northeast er sorry*"]

A zone clearance, to leave the CTR to the NE VFR not above two thousand ft, was issued at 1152:35, and read back correctly. The unit's MATS Part 2 states, on page 1-2, para 1.2.2 "*The following VRP's exist to assist controllers who wish to route VFR traffic clear of the final approach track for RW 08/26: Sandbanks, Hengistbury Head, Stoney Cross and Tarrant Rushton*". No VRP was referred to in this case.

The PA46 was transferred to the Bournemouth Tower frequency and, at 1156:10, the ADC transmitted "*PA46 c/s right turn out clear take off runway two six surface wind two eight zero degrees five knots*". The PA46 pilot simply read back "*Roger line up and take off on the runway two six PA46 c/s*". The APR explained that the unit operates a 'free flow' departure system with VFR traffic. Ac are permitted to depart, by the ADC, not above two thousand feet on a compass direction other than due W or E. The ADC passed the airborne time to the APR, and the time was marked on the fps. When asked why use was not being made of the VRPs, as recommended by the MATS Part 2, the APR explained that, approximately 4 years ago, they had been instructed not to use these VRPs in this manner. Nevertheless, the relevant entry remains in the current unit MATS Part 2.

[UKAB Note (3): The ADC frequency RT transcript shows the PA46 acknowledging the frequency change to the APR frequency at 1157:40.]

AIRPROX REPORT No 121/03

At 1159:20, the PA46 established communication with the APR and, having been told to report clear of the zone, the pilot replied *“PA46 c/s we are VFR flight from Bournemouth to Echo Bravo Kilo Tango via Golf Whiskey Sierra er Charlie and after Lydd”*. (The direct track from Bournemouth to GWC is 085°, which would take an ac close to the FAT for RW26). The APR’s response to this transmission was *“Roger PA46 c/s”*. He explained that he had assessed a VFR departure to the NE would not affect his IFR traffic, the BE76, which was turning onto a base leg 7nm NE of the aerodrome. He therefore saw no need to pass TI. Furthermore, he had not registered the impact of the PA46’s statement that the routeing would be GWC – Lydd. Arguably, a confliction could still have arisen even if the PA46 had taken up a northeasterly track.

Analysis of the Pease Pottage radar recording (not available to the APR) shows an intermittent secondary only response, squawking 7000, appearing soon after the PA46’s airborne time and corresponding to its routeing. At 1159:45, just after the pilot of the PA46 had established contact with the APR, the return becomes less intermittent and from 1200:16, the return is continuous. At that time, the BE76 was still on base leg and in the 11 o’clock position of the PA46, crossing from L to R at a range of 6.5nm. When the APR instructs the BE76 to turn R heading 240° (1200:30) and report established, the two ac are 5.4nm apart with the BE76 turning onto the FAT and the PA46 flying the reciprocal track. The returns from both ac are continuous as they close and, when TI was passed to the BE76 (1201:30), the PA46 was in its 1 o’clock position at a range of 1.8nm. The two ac continue on their tracks with the PA46 passing down the RHS of the BE76, at a range of 0.2nm. No height information is displayed by the PA46 and so it is not possible to establish the vertical separation as they pass.

The APR expressed surprise on seeing the Pease Pottage derived radar pictures. He explained that the unit has its own primary and secondary radar sources, located on the aerodrome. In his experience, the coverage of this equipment varies on a day-to-day basis. He recalled that the first time he saw a return from the PA46 was immediately before he passed TI to the BE76, although the pictures from the Pease Pottage radar shows a continuous return visible for some 80sec beforehand. In discussions on the Bournemouth radar performance, the APR, his SATCO and Manager ATS all advised that there was a known gap in coverage at a range of approximately 4 – 5nm on the final approach to both RWs. However, there is no entry to this effect in the unit’s MATS Part 2. The APR, when asked, advised that the coverage is so poor at times it is not always possible to conduct SRAs, particularly for small ac. He also confirmed that on the day of the Airprox, no ATC log entry was made to the effect that the radar was performing poorly nor did the previous radar controller mention radar performance during the handover.

The subject of avoiding action was discussed and the APR advised that he had decided not to pass any avoiding action instructions because, in his opinion, there was no need as the pilot of the BE76 could see the other traffic. He added that the tone of the pilot’s voice had not indicated any major concern over the situation. Passing TI fulfilled the MATS Part 1 requirements for Class D airspace, in respect of action to be taken by controllers to avoid unknown ac. This states the controller shall: -

“Pass traffic information unless the primary function of sequencing and separating IFR flights is likely to be compromised. If a pilot requests avoiding action it shall be provided to the extent determined by the radar controller. Give avoiding action if radar derived or other information indicates that an aircraft is lost, has experienced a radio failure, or has made an unauthorised penetration of the airspace”.

The use of VRPs, as recommended in the unit’s MATS Part 2, might well have prevented this Airprox. It is of concern, firstly that the unit has been dissuaded from their use and secondly, if their use is banned, that it has remained in the MATS Part 2. It would seem that use of the VRPs in the described manner is eminently sensible.

[UKAB Note (4): The MATS Part 1 Section 3 Chapter 1 Para 8 VFR Flights states *“Where Visual Reference Points (VRPs) are established outside controlled airspace, controllers should not instruct aircraft to hold over such VRPs. This does not apply to Visual Reference Points established within*

controlled airspace where a known traffic environment exists. VRPs are established to assist ATC in routeing VFR traffic and, at the same time, integrate it with IFR flights. Controllers should not direct VFR traffic over VRPs unless the IFR traffic situation specifically demands this.”]

If the performance of the radar at the time of the Airprox, was as reported, it is a matter of concern and if, as suggested, an ac can depart from the aerodrome, with a functioning transponder, and not be seen until 5.5nm from the aerodrome then it is debatable whether it is fit for task.

Recommendation.

It is recommended that the unit review its MATS Part 2 to ensure it is up to date and accurately reflects only the approved procedures to be used by controllers.

It is also recommended that steps be taken to ensure that the Bournemouth radar equipment is capable of providing the radar services and tasks for which it is approved.

[UKAB Note (5): The Pease Pottage recorded radar at 1200:12 shows the BE76 indicating FL019 (2140ft QNH 1021mb) until 1201:00 when the Mode C shows FL020 (2240 QNH) which was maintained until after 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.

There was general feeling that a little more care and assistance might have been afforded to the PA46 pilot (a foreign visitor) by Bournemouth ATC. The GMC had endeavoured to establish a safe departure routeing for the PA46 when, during the ac's taxi phase, he asked the pilot if he wished to depart to the NE or SE initially to keep clear of the FAT. However, no response was received to the GMC's transmission or to subsequent calls for about 20min but when the request was repeated, the crucial element - to remain clear of the FAT - was omitted. Also, it was thought that an instruction to fly to the NE was too imprecise for the purpose intended and members agreed with ATSI that a NE'y track would probably still have caused a conflict between the subject ac. The use of a VRP, in a departure clearance, does provide a routeing via a safe track out of CAS, avoiding RW FATs and IFR traffic. As it was, the departure clearance issued by the Bournemouth GMC, though read back correctly by the pilot, did not ensure that the PA46's track remained clear of the FAT and controller members judged this had caused the Airprox. Others felt this assessment was unfair and believed the Bournemouth APR had also been party to the outcome in equal measure, but controllers remained unconvinced. Later, the ADC gave the PA46 pilot take-off clearance “...with a right turn out...”, which did nothing to change events, and, after passing the airborne time to the APR, transferred the ac to the APR's frequency. After some delay the PA46 pilot called the APR 1min 40sec later and, when asked to report clear of the zone, told the controller that he was routeing via GWC and Lydd. The PA46 pilot's transmission was acknowledged by the APR who assumed the PA46 would route clear of the FAT – he said the ac did not show on primary or secondary radar at that stage. However, the pilot appears to have taken APR's acknowledgement as tacit approval to fly a direct track towards GWC and this routeing information was neither assimilated nor challenged by the APR. Members believed that the APR should have taken positive steps to ensure the ac was routeing in accordance with his clearance and, as the PA46 was not showing on radar, should have passed TI to its pilot on the BE76. Also of concern was the fact that the APR did not pass avoiding action to the IFR BE76 pilot when the PA46 did pop up on radar, squawking 7000, ahead of it and in conflict. Both of these elements were considered as contributing to the Airprox.

AIRPROX REPORT No 121/03

Turning to risk, the APR had seen the confliction late and passed TI to the BE76 pilot about 1nm ahead enabling her to acquire the PA46 visually, she estimated about 0.25nm ahead, in her 1230 position, slightly below, she took no avoiding action as she quickly assessed the other ac was going to pass clear on her RHS and 20ft below, though not by much. The PA46 pilot had been distracted by a fuel warning alarm after departure but he had fortunately seen the Beech, albeit late, 500ft ahead in his 1-2 o'clock position 100ft above and watched it pass 300ft away down his RHS, still 100ft above. The radar recording shows the ac passing abeam of each other separated by 0.2nm (370m). Although the events leading up to the Airprox had been far from ideal, the TI passed by the APR to the BE76 pilot and mutual visual sightings by both pilots were enough to persuade the Board that any risk of collision had been effectively removed.

In light of the events leading up to the Airprox, the Board fully endorsed the ATSI recommendations.

PART C: ASSESSMENT OF CAUSE AND RISK

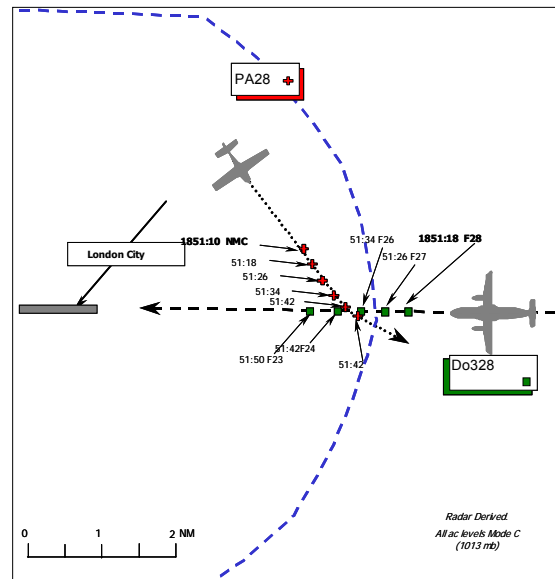
Cause: The departure clearance issued by the Bournemouth GMC did not ensure the PA46's track remained clear of the FAT.

Degree of Risk: C.

Contributory Factors: The Bournemouth APR did not give avoiding action to the BE76 pilot and did not pass TI to the PA46 pilot.

AIRPROX REPORT NO 122/03

Date/Time: 6 Aug 1851
Position: 5130N 00010 E (LCY096/4)
Airspace: Lon City Zone (Class: D)
Reporting Ac Reported Ac
Type: Do328-110 PA28R-180
Operator: CAT Civ Pte
Alt/FL: 2400ft
 (QNH 1018 mb) (N/K)
Weather VMC CAVOK VMC HAZE
Visibility: >10km
Reported Separation:
 <1/2nm H 0 V
Recorded Separation:
 0.15nm NR V

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

THE DO328-110 PILOT reports that he was heading 276° at 120kt, having just begun his final ILS approach to RW28 at London City Airport, when he was alerted by City Tower about an unidentified contact in their 1 o'clock position at a range of approx 3nm, tracking S with no height information. This contact was in a similar relative position to a TCAS contact that he had previously identified, also with no height information.

At approx 6nm DME he became visual with the traffic, and ascertained that it was converging and reported the contact to City Tower and simultaneously received a TCAS TA warning. The ac continued to move towards his flight path and at approx 4nm to run, the other pilot sighted them and turned left to track behind; he assessed its Alt to be constant at approx 2300-2400ft. He thought the ac to be similar to a Rockwell Commander and it was colourfully decorated, in what his flight deck colleague described as a maroon colour. The ac was not in contact with either City Tower or Thames Radar.

The flight deck crew assessed the closest point of approach to be within 1/2 nm at the same altitude but had good visual contact with it for several miles, and although it passed close by they did not feel it necessary to deviate from their ILS flight path.

THE PA28R-180 PILOT reports flying a red and white ac on a local sortie from Stapleford at the reported time of the incident but was not convinced there had been an Airprox. He saw a commercial ac, probably approaching London City but it was significantly above and caused him no concern. Since he was not contacted until some time after the incident he could not recall his Alt, the pressure setting or note the time of the sighting and apologised for not being more helpful. He stated that he was very conscious of the controlled airspace in the area and, given that the flight was a local pleasure flight, it is unlikely that his height would have been much above 2000ft; however, he did not retain any notes.

THAMES RADAR CONTROLLER reports that at approx 1840 he had just positioned a Dornier328 for an ILS to RW28 at London City Airport. Shortly after the Dornier was transferred to the Tower frequency he noticed a radar contact squawking 7000 with no Mode C, approx 4nm NE of London City tracking SE inside the Control Zone. He immediately telephoned City Control Tower and informed them of the contact, which they acknowledged. He continued to monitor the Do328 approach into London City and the conflicting ac, still squawking 7000 left the London City Zone to the E.

AIRPROX REPORT No 122/03

UKAB Note (1): The airfield elevation is 19ft. The radar replay indicates that the Do328 was at FL24 with a QNH of 1018; this equates to 2550ft amsl or 2531ft agl. The ILS Glide Path at London City is 5.5° therefore at 4nm ac should be passing 2352ft aal. This indicates that the Airprox occurred at about 4.3nm, as confirmed by the radar replay, and at approximately 2500ft agl. The vertical separation however, cannot be determined, as the PA28 was not squawking Mode C and the pilot could not recall his alt.

UKAB Note (2): In the area of the Airprox, London City Control Zone is Class D airspace, H24, out to 5nm arc and up to 2500ft amsl. The base of the London TMA in that area is 2500ft amsl.

ATSI reports that at the time of the Airprox, the Do328 pilot was in communication with the London City Aerodrome Controller, however immediately prior to the Airprox he had been in receipt of a Radar Control Service from Thames Radar. The PA28 was not in receipt of an ATC service. The Thames Radar Controller described both his workload and the traffic loading as 'light'

At 1847, the Dornier crew were instructed to reduce speed to 160kt (for spacing) and at that time it is possible to see on the radar recording the first indication of an ac squawking 7000, with no Mode C, just to the SE of Stapleford. Tracing action established this ac to be a PA28 from Stapleford which retained a 7000 squawk, with no Mode C, throughout.

At 1848:40, when the Do328 was approx 10nm ENE of London City, the Thames Controller instructed the pilot to turn right heading 240° and to report established on the ILS, which shortly after he did, at a range of 9.9nm and level at 3000 ft. Meanwhile, the PA 28 was 4.6nm NE of London City, having entered the Class D Control Zone, tracking S. The Controller then instructed the Do328 pilot to change frequency to City Tower and he continued his approach while the PA28 continued southbound on a converging track. After a short time, the Controller identified the developing conflict and immediately telephoned the London City Aerodrome controller, who subsequently passed TI on the unknown traffic. The Do328 pilot reported that he had the ac on TCAS and very shortly afterwards reported visual with the traffic, which he estimated to be at an Alt between 23 and 2400ft. The PA28 continued towards the Do328, closing to 0.3nm before turning left and passing behind it. The Do328 continued its approach to land and, after landing, the crew advised ATC that they would be filing an Airprox.

The Thames Radar Controller advised that ac transiting the London City Control Zone without an ATC clearance were, in his experience, a rarity and numerous ac called for crossing clearances and these were usually granted. When the Do328 was transferred to the Tower frequency, he had not noticed the 7000 squawk displayed by the zone infringer. As the Do328 pilot established communication with the City Aerodrome Controller, the PA28 was in his 2 o'clock at a range of 6.5nm and on a converging track. The Do328 was within Class A airspace and, provided it complied with its clearance to descend on the ILS, would remain within CAS until landing. The Thames Radar Controller believed that he had become engaged in either dealing with his flight progress strips or discussing operational matters with the Coordinator immediately after transferring the Do328. Nevertheless, a short time later he had become aware of the infringer and, 55sec after the transfer, he telephoned the Aerodrome Controller using the 'non' priority line. The Controller answered, querying who was working the 7000 squawk and was advised that it was not known traffic and requested that the Aerodrome Controller alert the Do328 pilot.

MATS Part 1, section 1, Chapter 5, Page 13 Para 14.2, states that within Class D airspace, controllers are to give avoiding action if radar derived or other information indicates that an ac is lost, has experienced a radio failure, or has made an unauthorised penetration of the airspace. As the upper level of the London City CTR is contiguous with the lower limit of the London TMA, it was clear from the radar display that the PA28 had entered CAS without a clearance. The Radar Controller explained that he had expected the Aerodrome Controller to issue avoiding action as necessary, however, he was available to relay instructions to the Do328 via the Aerodrome Controller if required. The Thames Radar Controller agreed with hindsight, that he should have used the priority telephone line to London City and ensured that more positive action was taken, in accordance with the MATS Part 1 instructions.

The Thames Radar Controller advised that at their present location, within LTCC at West Drayton, they could not monitor the City Tower frequency, unlike previously when Thames Radar was located at Heathrow Airport. This facility would have enabled him to realise quickly that the Dornier crew had visually acquired the traffic.

The Thames Radar Controller did not detect the confliction between the Do328 and the infringing ac prior to transferring the Do328 to the tower frequency and by the time he spotted the confliction, and telephoned the City Aerodrome Controller, lateral separation had reduced to 3nm.

Fortunately the Do328 crew acquired the other ac first on TCAS and, shortly afterwards, visually. The Thames Radar Controller should have been more proactive by using the priority telephone line and ensuring avoiding action was issued to the Do328, as is required by MATS Part 1, rather than leaving it to the City Aerodrome Controller.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Considering firstly the part that the 2 pilots played in this incident, the Board believed that there was little doubt that the track seen on the recording of the Heathrow radar emerging from the vicinity of Stapleford, tracking SE and entering the London City Zone, was that of the PA 28 concerned. Further, from the RT transcript, there was no doubt that the pilot did not ask for permission to enter, either from City Tower or Thames Radar. As the ac approached, their respective pilots had seen the other ac; a slow left turn putting the PA28 behind the Do328 could be seen on the radar recording, but it was not clear to members whether it was avoiding action or simply a navigational turn to exit the zone more quickly. In any case, the radar showed that the minimum lateral separation when the ac were converging was of the order of 0.2nm (400yd), very similar to the figure reported by the Do328 pilot. The vertical separation however, could not be verified with the Do328 pilot stating it to be about 100ft, probably estimated at a range of 3nm when the ac was first spotted as a result of TCAS, and the PA28 reporting the airliner as being 'significantly above' him. Since the PA28 was not squawking Mode C (not switched on), only a TCAS TA was received. One possible scenario was that the PA 28 pilot on seeing the airliner, realised that he was in the zone, and turned left and descended both to avoid it and to exit the zone more expeditiously. If this were the case, it would explain the differences in the pilots' perception of the vertical separation. Notwithstanding this, the pilot of the Do328, having seen the PA28 turn away from him, decided that avoiding action was not necessary, a good indication that there was no risk of collision and that there was only a minimal compromise to the safety of his ac.

Turning to the ATC aspects of the incident. Some specialist ATC Board members believed the ATSI report concerning the actions of the Thames Radar Controller to be slightly harsh and that his actions, though perhaps not strictly in accordance with best practice, had not materially contributed to this incident. In particular, there was unresolved debate regarding where the responsibility should lie for giving avoiding action in such circumstances after an ac has been transferred to the Tower frequency at civil airports.

PART C: ASSESSMENT OF CAUSE AND RISK

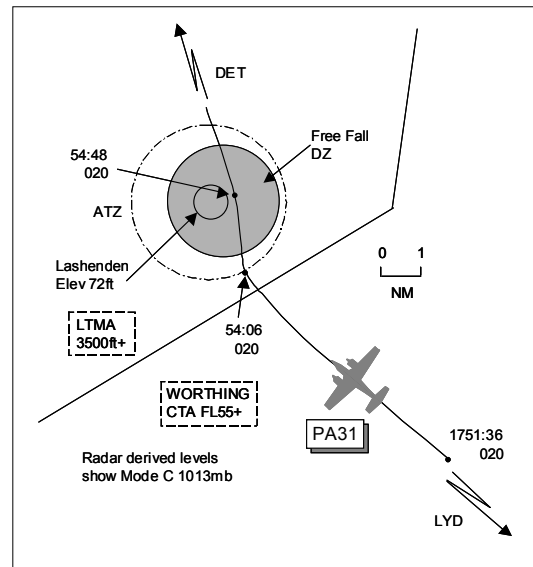
Cause: The PA28 pilot flew into the London City Zone (Class D) without clearance.

Degree of Risk: C.

AIRPROX REPORT No 123/03

AIRPROX REPORT NO 123/03

Date/Time: 2 Aug 1754 (Saturday)
Position: 5109N 0039E (0.25nm E
Lashenden/Headcorn - elev 72ft)
Airspace: FIR (Class: G)
Reporting Ac Reported Ac
Type: Parachutist PA31
Operator: Civ Club Civ Pte
Alt/FL: 4000ft↓ 2800ft
(QFE) (QNH)
Weather VMC CAVOK VMC CAVOK
Visibility: >10km 20nm
Reported Separation:
just below not seen
Recorded Separation:
NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE PARACHUTIST reports exiting the drop ac at 12000ft and practising several manoeuvres before pulling (deploying the parachute) at between 4500-4000ft. After checking the canopy was without malfunction and having completed 1 or 2 turns, he heard the sound of an ac nearby. He looked around to try and locate it and saw a white coloured ac pass just below him; at that time he was directly overhead the RW at Headcorn. He immediately made his way towards the landing area.

THE PARACHUTE CLUB reports an instructor, a pilot and the Drop Zone Observer also observed the incident on the ground. Fourteen parachutists had exited the LET410 drop ac at 12000ft with all jumpers opening their canopies between 2000ft and 5000ft; the reporting student parachutist opened his at about 4000ft. A twin-engined ac was spotted by the Drop Zone Observer, about 0.25nm away to the SE tracking NW, and then by other club observers through ground telemeters. Using binoculars, the first and last two letters of the ac's registration were obtained as it passed directly through the overhead at about 2000-3000ft adjacent to several canopies but closest to the reporting parachutist, passing below him and 100m horizontally away without taking any avoiding action. Adjacent ATSU's were contacted and LTCC was able to provide the ac's identification and flight details.

THE PA31 PILOT reports heading 335° at 170kt en route from France to Elstree at 2800ft QNH and he was in receipt of an 'advisory' service from Thames RADAR, he thought, on 132.7MHz squawking 7000 with Mode C. The visibility was 20nm in CAVOK VMC, the ac was coloured white and the strobe lights were switched on. He had flown vertically and laterally outside the Headcorn CTZ although ATC at Headcorn had later claimed that an ac had flown close to a parachutist; neither he nor his co-pilot had seen anything. ATC did not have his ac details (registration) and no NOTAMS were issued for Headcorn. His details were obtained by Headcorn ATC asking the Thames controller to interrogate him on the RT; giving his name had been very demeaning and stressful. The Thames ATCO did not accuse him of any infringement but was only responding to Headcorn's telephone call. He believed that his height and track combined with the absence of NOTAMS had meant that he had been safe during his transit of the area.

ATSI reports this Airprox has no apparent civil ATC implications. An examination of the relevant RT recording shows that the PA31 pilot established communications with Thames Radar at 1800:20 (>5min after passing Headcorn). At 1801:00 the pilot reported his position as 10 miles NW of Detling, en route

Le Touquet to Elstree, VFR at 2300ft on 1021mb and wearing SSR code 7000. Thames Radar issued the flight discrete SSR code 7050 and a transit clearance through the London City CTR. A few minutes later, at 1806:38, the Thames controller informed the flight that a representative of Headcorn airfield wished to contact the pilot as witnesses there believed the ac had flown through 'their circuit'. The pilot of the PA31 responded "...*We were actually well above their airfield we were about 2400 and I think their airfield only* (the next word is unclear, possibly 'ascends') *to 2000*". At Headcorn's request the Thames Radar controller then asked the PA31 for the pilot's name, which was provided, though with some understandable reluctance by the pilot concerned. Unless absolutely necessary requests for individual names on the RT should generally be avoided for obvious confidentiality reasons. It is preferable that the exchange of such information be undertaken by mutual agreement via telephone after the ac has landed.

UKAB Note (1): Met Office archive data show the Headcorn QNH as 1021mb.

UKAB Note (2): The UK AIP ENR 5-5-3-2 promulgates Lashenden/Headcorn as a Free Fall Drop Zone, a circle 1.5nm radius of 510925N 0003902E from 3500ft altitude (with drops made from up to FL150 with LTCC permission) normally during daylight hours. Activity notified on the day to Manston ATC or LTCC outside hours of Manston. Alternative contact Lashenden/Headcorn on 122.00MHz.

UKAB Note (3): The UK AIP AD2-EGKH-1-1/1-3 promulgates the Lashenden/Headcorn ATZ as a circle radius 2nm centred on RW11/29 510925N 0003830E from surface to 2000ft above airfield elevation 72ft. Hours 0900-SS with A/G available Lashenden RADIO on 122.00MHZ. Local traffic regulations (warnings) states that free-fall parachuting takes place up to FL150 with the DZ situated 300m NE of RW29 threshold.

UKAB Note (4): The Airprox is not seen on recorded radar. Analysis of the Pease Pottage radar recording at 1751:36 shows the PA31 squawking 7000 8.5nm SE of Lashenden/Headcorn tracking NW indicating FL020 (2240ft QNH 1021mb) with the Paradrop ac O/H the airfield indicating FL119, having just commenced descent from FL120 in a LH spiral descent. At 1754:06, the PA31 is seen to turn onto a 350° track 2nm SSE of Headcorn at FL020 (2240ft QNH) by which time the Paradrop ac is 2nm ENE of the airfield turning L through a NNW'ly heading indicating FL070 descending. The PA31 passes directly overhead the DZ at 1754:48 indicating FL020 (2240ft QNH) as the Paradrop ac is descending through FL041 (4340ft QNH) in its 12 o'clock range 0.8nm head-on turning L through 180° before it clears rapidly to the E of the PA31 12sec later, whilst continuing descent within the lateral limits of the ATZ. No other radar returns are seen during the incident.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members were dismayed that the PA31 pilot believed that the parachute activity at Headcorn would have been NOTAM'd and that his passage through the area had been safe. Although the parachute detail had involved a drop from high level (FL120), the base of CAS was 3500ft over the DZ, contiguous with the normal upper promulgated drop level. Whether the pilot had planned to fly overhead the aerodrome or not was unknown, but a direct track from LYD to DET would have routed his ac to the E of Lashenden/Headcorn. Either way the option to call on the Headcorn frequency to check activity was not exercised. Despite the notified information in the AIP and the site being marked on 1:500 000 and 1:250 000 topographical charts showing a warning of intense parachuting activity, the PA31 pilot had flown directly overhead the Free Fall Drop Zone and in doing so had displayed poor airmanship. The outcome was that he had flown into direct conflict with one of several parachutists, whom he did not see, and this had caused the Airprox.

AIRPROX REPORT No 123/03

Parachutists have limited ability to manoeuvre quickly even under aerofoil canopies and are particularly vulnerable when faced by a high-speed intruder. The PA31 was seen by the parachutist to pass below him, which was corroborated by the ground parties and although no vertical distance was given they reported some lateral displacement had existed. The DZ observer had seen the approaching 'intruder' late, but at that stage the parachutists had already exited the drop ac over 3min earlier when the PA31 had been more than 8nm away. For his part the Piper twin pilot had not seen any of the parachutists, nor the drop ac spiralling down ahead of his track from above his ac. Although the separation achieved between the parachutist and the ac had been purely fortuitous, members believed that the PA31 pilot would have seen the conflicting parachutist in his field of view if there had been an actual risk of collision. Nonetheless, the Board were in no doubt that the safety of the parachutist and PA31 had not been assured during the encounter.

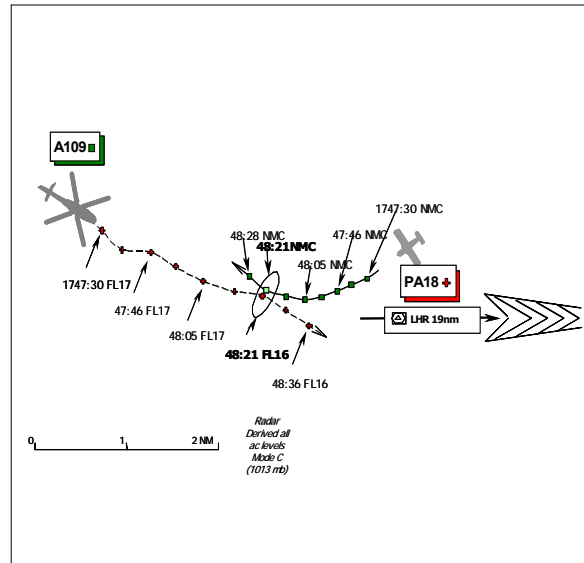
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The PA31 pilot flew through the Lashenden/Headcorn Free Fall Drop Zone into conflict with a parachutist whom he did not see.

Degree of Risk: B.

AIRPROX REPORT NO 124/03

Date/Time: 8 Aug 1752
Position: 5152N 00057W (2nm N of Reading)
Airspace: London FIR (Class: G)
Reporting Ac Reported Ac
Type: PA18 Super Cub Agusta 109
Operator: Civ Pte Civ Pte
Alt/FL: 1800ft 1500ft
 (QNH 1020mb) (QNH)
Weather VMC HAZE VMC HAZE
Visibility: 3km into sun/ 4nm
 8km down sun
Reported Separation:
 0.25nm H 50ft V <0.25nm H
Recorded Separation:
 ~0.07nm H NR V.

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

THE PA18 SUPER CUB PILOT reports flying a white and blue ac on a local sortie from North Moreton near Wallingford on a listening watch on the Benson App frequency and, he thought, squawking 7000A. While cruising at 80kt on a westerly heading at an alt of 1800ft on the QNH, 2nm N of Reading, a helicopter emerged from haze on his left side, slightly above and in a right turn at a distance of ½nm. He initiated a right turn to increase separation passing ¼ nm from the helicopter and 50ft above it. As the visibility into sun was very poor, he assessed the risk of collision to be medium. Since he was not in communication with any ATC agency, he reported the incident by telephone to AIS Mil the following day.

THE AGUSTA 109 PILOT reports flying a blue helicopter with nav lights and strobes selected on, from Cirencester to a site near Ascot, in contact with Heathrow Radar on 119.9 (Heathrow SVFR Controller) squawking as directed at about 1500ft on the Heathrow QNH and heading 110° at 150kt. The other ac was first seen at 1nm ahead. He believed he was receiving a RIS from Heathrow Radar but they did not give any warning of this ac, he thought possibly because it was either not transponder equipped, or was not squawking. He reported that it was difficult to assess how close the ac was on passing, since he was occupying the RH seat and broke right to avoid the ac; the cross-cockpit view down the left side is poor. As he broke right, the other pilot saw him and did the same. He thought that by not notifying him of the pop-up traffic, Heathrow Radar had contributed to the incident.

LHR UNIT INVESTIGATION this incident was brought to our attention, over a month after it occurred, by SRG who had received notification of the occurrence from the UKAB. Neither of the pilots reported the Airprox on the RT. However, SRG have reviewed both the RTF tape transcript and the radar recordings of the event. The A109 was the only ac of the two, which was in contact with SVFR and the pilot states that he was under a RIS. The RT transcript reveals that no service was specified by SVFR and the pilot was given only a clearance to enter CAS inbound to his landing site. The conflicting traffic did not show on the Heathrow 10cm radar although it could be seen on the 23cm. Therefore, if the controller had been using the former, he would not have seen the confliction.

ATSI reports that the A109 pilot established communications with the Heathrow SVFR Controller at 1746:50, when the ac was 7nm WNW of WOD. The Controller issued a discreet squawk and, at 1747:50, identified the ac. A radar service was neither requested by the pilot nor specified by the

AIRPROX REPORT No 124/03

Controller. The recording of the Heathrow 23cm radar, showed a primary return appear at 1747:55, in the 12 o'clock position of the A109, at a range of 2nm however, no corresponding return can be seen on the recording of the Heathrow 10cm radar. The 2 returns continue to close and, at 1748:28, they are virtually coincident before emerging on reciprocal tracks. It is evident from the recording that the A109 made a right turn of some 30° immediately before the ac passed. Since the A109 pilot made no comment on the RT at the time, the Controller was unaware of the incident. The helicopter began a descent towards its destination and the last RT exchange was at 1752:25.

The A109 pilot's report states that he was in receipt of a RIS, however, no such service was requested or offered, therefore this assumption was not correct. If a pilot does not request a specific type of service, then the Controller should state what type he is providing. In this case however, the Heathrow 10cm radar did not show the PA18 and, since it was likely that the SVFR Controller was using this radar at the time, he could not have passed any information about it to the A109 pilot.

UKAB Note (1): The recording of the Heathrow 23cm radar shows the A109 squawking 7041/016 heading in an easterly direction with about 9nm to run to the Heathrow CTR at the time of the Airprox. A primary contact believed to be the PA18 heading W disappears on the sweep when the Airprox occurs, reappearing to the W on the following sweep (4sec later). From the projected track of the PA18 and the actual position of the A109 at 1748.21 it has been calculated that the horizontal separation was about 0.07nm (~400ft).

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board determined that this was an incident with both ac operating VFR in Class G airspace and that the belief of the A109 pilot that he was in receipt of a radar service from the Heathrow SVFR Controller was mistaken, as none was requested or offered. It was therefore a case of see and avoid by both pilots. Since the A109 pilot had to initiate a break manoeuvre, Board members were surprised that he did not immediately file an Airprox with the Heathrow Controller.

The pilot of the A109 first saw the PA18 at a distance of 1nm just to the left of his 12 o'clock, almost head on and slightly above him; the pilot immediately commenced a level break to the right. Possibly due to a combination of sun, haze, and the near head-on aspect, the PA18 pilot did not see the helicopter until it was at a range of ½nm also initially, slightly above him but descending slowly in a turn to the right. He too immediately initiated a right hand turn and the combined manoeuvres resulted in a miss-distance, agreed to be about ¼ nm and almost co-altitude while closing at 4nm/min.

Specialist members pointed out that with current technology it is only possible to measure ac separations to an accuracy of about 0.1nm, therefore the recorded miss-distance at Part A is probably pessimistic.

Notwithstanding the hazy conditions, both pilots saw the opposing ac in time to react correctly and generate a reasonable miss-distance considering their fairly slow rate of closure. Taking this into account, the Board agreed that there had not been a risk of their colliding and that the compromise to their safety had been minor.

PART C: ASSESSMENT OF CAUSE AND RISK

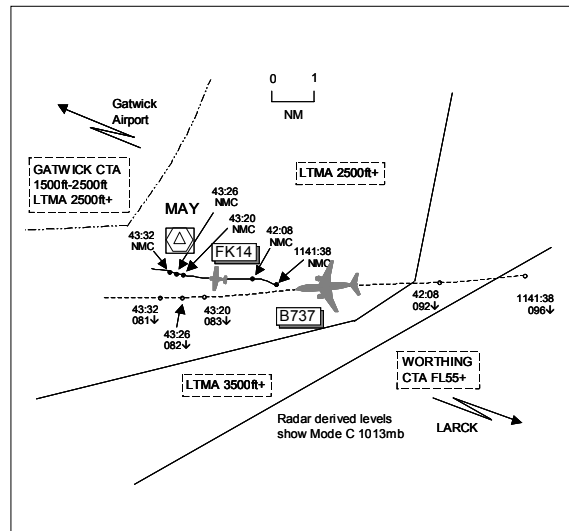
Cause: A conflict in hazy conditions in Class G airspace resolved by both pilots.

Degree of Risk: C.

AIRPROX REPORT No 125/03

AIRPROX REPORT NO 125/03

Date/Time: 10 Aug 1143 (Sunday)
Position: 5100N 0006E (2nm S MAY)
Airspace: LTMA (Class: A)
Reporting Ac Reported Ac
Type: B737-400 FK14
Operator: CAT Civ Pte
Alt/FL: ↓FL80 c9000ft
(QNH 1019mb)
Weather VMC CAVOK VMC CLNC
Visibility: >10km 30nm
Reported Separation:
100ft V 1-2nm H 300ft V 2000m H
Recorded Separation:
0.6nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE B737 PILOT reports heading 270° at 250kt inbound to Gatwick squawking 6663 with Mode C and in receipt of an ATS from Gatwick on 126.82MHz. The visibility was >10km in CAVOK VMC. Near to MAY when levelling at FL80, TCAS annunciated “traffic” on an ac with no altitude readout. The traffic was visually acquired, a white coloured single engine ac, in his 3 o’clock position range 1-2nm at FL81 on a similar heading. The other ac was overtaken and ATC informed that an Airprox would be filed, the flight continued without further incident. He assessed the risk of collision as medium.

THE FK14 PILOT reports heading 275° at 80kt inbound to Popham from Belgium at about 9000ft QNH 1019mb and in communication with Popham RADIO on 129.8MHz squawking 7000 with NMC. The visibility was 30nm in sky clear VMC, the ac was coloured white/blue and the nav and strobe lights were switched on. Near to Gatwick he saw a B737 on his LHS about 2000m away and 300-500ft below him. He turned R 90° to increase the separation distance before turning on course and he assessed the risk of collision as very small. He was unfamiliar with flying in UK airspace and during his navigation preparation for the flight, he had misinterpreted the + sign after the FL indicator on the UK chart and had only been informed post flight, after landing at Popham, that he had infringed CAS; he had been using a Bendix-King Skymap IIC GPS Navigation system for precise navigation. Subsequently he has carefully studied a VFR flight manual and will ensure that any future planned flights to the UK are discussed with qualified personnel prior to departure. Also he has received flying instruction during his visit to the UK and deeply regrets his actions in this incident.

THE TC GATWICK INTERMEDIATE DIRECTOR reports the B737 was given a heading for downwind at FL80 and its pilot reported TCAS traffic. He told the pilot that traffic in his 2 o’clock squawking 7000 with no height information was believed to be outside CAS. The B737 pilot replied that the other ac was at 8200ft and was a light single engine ac. He asked the pilot if he was visual with it and he confirmed he was. No avoiding action was given as the speed difference meant that the B737 was quickly clear of the conflicting ac and subsequently all other inbound/outbound ac were vectored clear of the unknown ac.

ATSI comments that the B737 was inbound to Gatwick and approaching LARCK. The Gatwick Director gave the crew a radar heading to leave the hold and cleared them for further descent. From the radar recording, a 7000 squawk can be seen approximately 2nm SE of MAY tracking NW, but no Mode C is

displayed. As the controller had received no information to the contrary, he was entitled to assume that this 7000 squawk was associated with an ac operating outside CAS.

The B737 was given descent to FL80 and vectored towards a downwind RH position for RW08R at Gatwick. The 7000 squawk turned slightly L and started to track W, still with no Mode C displayed while the B737 was overtaking it, from behind, to pass down its LHS. At 1143:20, the crew of the B737 reported that they had a light ac both on TCAS and visually. The Director informed them about the 7000 squawk to which the crew responded that the light ac was actually at FL82. The two ac passed with a lateral separation of 0.6nm. No ATC causal factors were found.

UKAB Note: Analysis of the Pease Pottage radar recording at 1141:38 shows the B737 squawking 6663 8nm E of MAY tracking 265° indicating FL096 descending with the FK14 squawking 7000 NMC in its 12 o'clock range 5-8nm tracking 300°. At 1142:08 whilst the B737 is descending through FL092 the FK14 is seen to turn L onto a track of 275°, both ac continue on steady tracks with the FK14 slowly diverging. When the B737 pilot reports TCAS and visual contact, at 1143:20, the B737 is descending through FL083 with the FK14 in its 1-2 o'clock position range 0.75nm. The CPA occurs on the next sweep at 1143:26, the B737 is seen descending through FL082 passing 0.6nm SSE of the FK14. Six sec later the B737 is indicating FL081 passing abeam the FK14 at a range of 0.65nm.

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 FK14 pilot had planned his flight from the continent to the UK with no proper understanding of UK airspace and had incorrectly read the UK charts. He had then placed reliance on a GPS Navigation aid with little reference to much else. Consequently, these inadequacies had led to an unauthorised penetration of Class A airspace (LTMA) by the FK14 pilot, who flew into conflict with the B737. This had caused the Airprox.

Even though there had been an element of surprise during this incident, the chain had been broken first by the TCAS alert. The B737 had received a TCAS TA and its pilot reported this to the Gatwick Intermediate Director (INT DIR) who saw traffic, in the Boeing's 2 o'clock position, squawking 7000 with NMC. The INT DIR had assumed, understandably, that this squawking ac had been outside (below) CAS but the B737 pilot reported seeing an ac (the FK14) in that position at 8200ft and had watched the light ac pass, reported at 1-2nm away, on his RHS 100ft above; no avoiding action had been necessary. Fortunately the good weather conditions with clear visibility had allowed visual acquisition by both crews, the FK14 pilot seeing the B737 as it passed on his LHS at what he thought was 2000m away and 300ft below; he had then turned R to increase the separation distance. These elements, when combined with the geometry of the encounter, led the Board to conclude that, in the end, there had been no risk of any collision despite the intrusion into CAS that had gone undetected initially.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Unauthorised penetration of Class A airspace (LTMA) by the FK14 pilot, who flew into conflict with the B737.

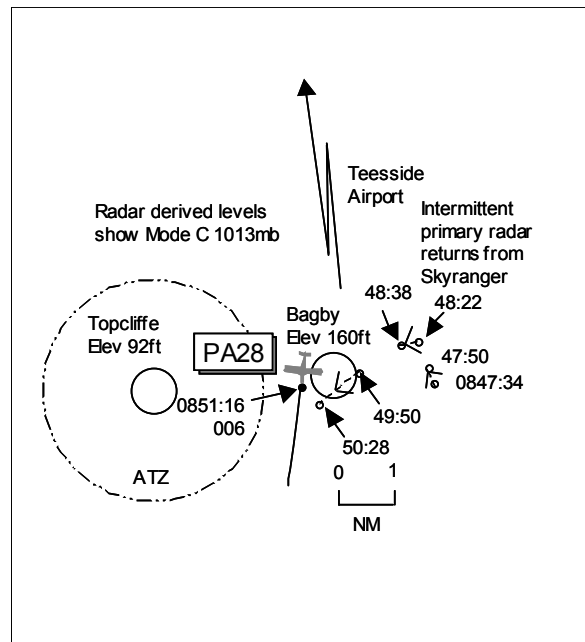
Degree of Risk: C.

AIRPROX REPORT No 126/03

AIRPROX REPORT NO 126/03

Date/Time: 10 Aug 0851 (Sunday)
Position: 5412N 0118W (W Abm RW06
T/Hold Bagby - elev 160ft)
Airspace: FIR (Class: G)
Reporter: Bagby A/G Operator

<u>First Ac</u>	<u>Second Ac</u>
<u>Type:</u> Skyranger	PA28
<u>Operator:</u> Civ Pte	Civ Club
<u>Alt/FL:</u> 300ft↓ (QFE)	700ft agl (QNH)
<u>Weather</u> VMC CLBC	VMC HAZE
<u>Visibility:</u> NR	poor
<u>Reported Separation:</u> not seen	50ft V 250m H
<u>Recorded Separation:</u> NR	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BAGBY A/G OPERATOR reports that he heard a loud engine noise approaching from the N which he thought might be either an ac or motorcycle. He then saw a red/white ac crossing just to the W of the RW06 threshold tracking S at an estimated height of 300-500ft agl which was passing about 300m ahead of a Skyranger, without altering course; the Skyranger was turning in from a tight RH cct onto finals to land. After broadcasting a warning to the Skyranger pilot on the A/G frequency 123.25MHz, whose pilot did not see the conflicting traffic, he tried calling the offending ac but received no response. At the time, the visibility was about 3000m in haze below cloud and he assessed the risk of collision as high. Teesside ATC were contacted by telephone and provided him some details of a PA28 which had departed from the airport routing to Southampton.

THE SKYRANGER PILOT reports flying inbound to Bagby from a private site approx 4nm to its SE and in communication with Bagby RADIO on 123.25MHz. Whilst turning his blue/white coloured ac R onto final approach RW06 at Bagby and descending through 300ft QFE at 55kt he was told by the A/G operator of traffic crossing ahead of his flight path but no other ac was seen. He could only surmise that the other ac must have passed behind him as the vision ahead from his cockpit is exceptional.

THE PA28 PILOT reports heading approx S at 100kt en route from Teesside to Southampton squawking 7000 with Mode C. The visibility was poor owing to haze and his ac was coloured red/white and his strobe lights were switched on. After leaving the Teesside frequency, he attempted to contact Leeming Approach and then Fenton Approach to check for local activity, but he had not received any response to his transmissions, so his intention was to contact London Information for a service. The weather had caused him to fly at a low altitude (approx 700ft agl) but he was experienced at low-level navigation, a skill that he had received training in and which he also maintained currency in by practising, not just using it when the weather was bad. He was concentrating on maintaining a good lookout and on remaining clear of the Church Fenton ATZ. The combination of all of these factors probably led to him not looking at the map as often as he would normally and therefore passing very close to Bagby which he normally avoided, aware of how busy they can be. He first sighted a blue/yellow coloured, possibly low winged, single engined ac in his 2 o'clock position at a similar level, possibly slightly higher, crossing R to L. He turned R through 30° to pass behind and below the other ac, an emergency avoiding action

break was not required, with vertical separation judged to be <50ft vertically and 250m horizontally. He assessed the risk of collision as slim.

UKAB Note (1): Met Office archive data shows the Leeming METAR 0850Z 03005KT 7000 HZ SCT080 SCT250 24/19 Q1016=

UKAB Note (2): Bagby is an unlicensed airfield situated 3nm E of Topcliffe Aerodrome situated within the Leeming/Topcliffe CMATZ. The UK AIP at ENR 2-2-2-4 states the Topcliffe ATZ is a circle radius 2nm centred on RW05/23 541220N 0012255W up to 2000ft aal active H24.

UKAB Note (3): The Airprox occurs outside of recorded radar coverage. The PA28 is shown initially on the Great Dun Fell radar recording and is identified from its 7041 Teesside squawk before it changes to 7000 and fades from radar at 0847:46 about 6nm NW of Bagby. Meanwhile at 0847:34 the Claxby radar recording shows an intermittent primary only return, believed to be the Skyranger M/Light, 1.8nm E of Bagby tracking NW. This radar return fades after a further 2 sweeps before reappearing at 0848:22 1.1nm NE of Bagby tracking SW. Again after showing for 3 sweeps the return fades but reappears just over 1min (0849:50) later 0.5nm E of Bagby tracking 225° in a downwind RH position for RW06. The primary return fades finally at 0850:28 0.5nm SW of Bagby. Forty-eight seconds later a 7000 squawk appears, believed to be the PA28, 0.7nm WSW of Bagby indicating FL006 (690ft QNH 1016mb) tracking 190° which is when the Airprox is believed to occur.

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.

It was noted that Bagby was an unlicensed airfield with no ATZ protection. However, the airfield is marked on charts. Members were critical of the airmanship displayed by the PA28 pilot when, shortly after getting airborne from Teesside, he continued on a cross country flight after weather had forced him to fly at a low altitude to maintain VFR. Although concentrating on look out and remaining clear of the Church Fenton ATZ ahead on his intended track, his attention to map reading was interrupted and this had led him to fly closer to Bagby than he intended. Flying into sun in hazy conditions, the PA28 pilot had then seen the Skyranger, albeit late, which was turning onto final approach for RW06. The late sighting had been a part cause of the Airprox. The Skyranger pilot had not seen the crossing PA28 at all which was also assessed to be a part cause of the incident, although a minority of members felt the non-sighting was understandable on the grounds that he had a reasonable expectation that other pilots would avoid flying close to Bagby airfield.

There were two different perspectives of the incident reported. The A/G operator had seen the conflicting southbound PA28 and passed TI to the Skyranger pilot, believing that the Piper was at a similar height and passing in front of it from his viewpoint on the airfield. The PA28 pilot's viewpoint had been different. He saw the Skyranger in his 2 o'clock at about the same level crossing R to L and turned 30° R to avoid, passing an estimated 250m behind and <50ft below. The Skyranger pilot might not have expected to see/meet a crossing ac in that 'cct position' and would almost certainly have been concentrating on his ac v RW relative perspective viewpoint; he presumed that the conflicting ac must have passed behind him. These discrepancies could not be resolved by the Board. Two members believed that the PA28 pilot had discharged his duties with respect to 'see and avoid' in Class G airspace and had resolved the confliction effectively. However, this view was not shared by the majority. The PA28 pilot had been cognisant of Bagby's existence but had flown through the cct in hazy conditions, seen the Skyranger late and turned to pass close behind it and just below. The Board agreed that his actions had been sufficient to remove the risk of an actual collision but 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

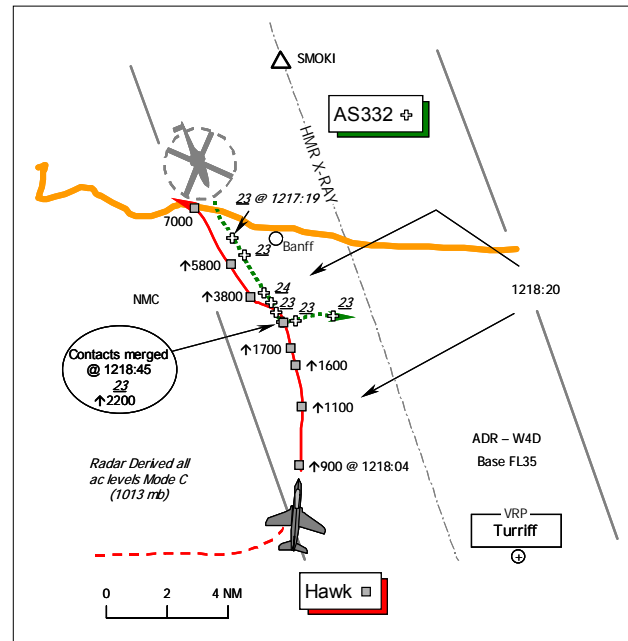
Cause: A non-sighting by the Skyranger pilot and a late sighting by the PA28 pilot in the vicinity of an unlicensed promulgated airfield.

Degree of Risk: B.

AIRPROX REPORT NO 127/03

Date/Time: 12 Aug 1218
Position: 5738N 0235W (8½nm S of SMOKI)
Airspace: Scottish FIR (Class: G)
Reporter: Aberdeen APR

	<u>First Ac</u>	<u>Second Ac</u>
<u>Type:</u>	AS332	Hawk T1
<u>Operator:</u>	CAT	HQ PTC
<u>Alt/FL:</u>	2500ft	↑6500ft
	QNH (1022mb)	(RPS)
<u>Weather</u>	IMC in cloud	IMC Between layers
<u>Visibility:</u>	Nil	2km
<u>Reported Separation:</u>	Not seen	500yd H
<u>Recorded Separation:</u>	Contacts merged - 100ft V	

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

THE ABERDEEN APPROACH RADAR CONTROLLER (APR) reports that the AS332 crew made first contact on 119.05MHz as they coasted in at 2500ft ALT near Banff, which is the normal transfer point for inbound helicopters that have been working Lossiemouth ATC. The crew was instructed to squawk 'ident', whereupon another squawk - A7001 – was spotted that had not been observed before, to the S of the AS332. The unknown ac indicated 1000ft Mode C initially and then 1300ft climbing as it tracked northwards towards the AS332, so immediately the traffic was called to the AS332 crew who responded that they were flying in IMC. A turn to the E was issued as she continued to update the AS332 crew with traffic information and placed the flight under a RAS. The unknown ac appeared to "brush" down the right hand side of the AS332 and the next clear Mode C readout indicated it was at 3000ft, after it had passed to the N of the AS332.

As they were in IMC, the AS332 crew did not sight the other ac. Subsequently, the unknown ac displayed a Lossiemouth squawk - A3711. The AS332 pilot then advised that they had spoken to Lossiemouth [on their other box] and were told that they were not controlling any traffic in the vicinity of the helicopter at the time.

THE AS332 PILOT reports his ac has a red/white & blue livery; the HISL and forward facing floodlights were on. Whilst inbound to Aberdeen under IFR in receipt of, he thought, a RIS from Aberdeen RADAR; the allocated squawk was selected with Mode C, but neither TCAS nor any other form of CWS is fitted.

Flying in level cruise at 2500ft QNH (1022mb), IMC in cloud, heading 170° at 130kt, ATC reported traffic about 5nm away at 1000ft heading towards them. On the next call the other ac was reported at 1800ft so the controller passed an avoiding action L turn onto 090°, which was complied with. The last call from ATC advised that the other ac, which was not seen at all, had passed behind them at 3000ft. He was unable to assess the risk.

THE HAWK T1 PILOT, a QFI flying with a student in the front seat, provided a comprehensive report stating his jet has a black colour scheme and the nose landing light and HISLs were on whilst engaged in a 'high-low profile' sortie with three targets in LFA 14 prior to a planned stop at Lossiemouth. A

AIRPROX REPORT No 127/03

squawk of A7001 was selected with Mode C, but neither TCAS nor any other form of CWS is fitted. They were listening out on the LFS frequency of 300.8MHz.

With the weather becoming increasingly poor - a lowering cloud base, but still within VMC limits – they completed the last target with an easterly run-in towards Turriff. Once off the target they turned N towards Banff on the coast. The QFI's intention was to remain VMC below cloud and to turn onto a westerly heading once over the sea for a visual recovery to Lossiemouth. However, approaching the coast with no better options of being able to turn east or west he became increasingly concerned about the lowering cloudbase. Fuel was now on minimums, removing the option of a turn around onto S away from Lossiemouth and he was aware of the *“advisory airway X-Ray above with a base of 3500ft amsl”*. At this stage he believed there was no option left but to initiate a 'low level abort', as the cloudbase would soon force them to fly below VMC limits. He ordered the student to initiate the 'low level abort' that was flown by the front seat student pilot - as is SOP. The safety altitude was 6500ft. Heading 345° at 350kt passing about 2500ft amsl, they broke through the cloud tops, in a 30° nose-up climbing attitude. At this stage both he and his student spotted a large helicopter in their R 1 o'clock - 1km away, slightly above them in a level L turn. The student then initiated a left-hand turn and they passed 500yd behind the helicopter at the closest point in a climbing attitude. VMC was then achieved and the ac recovered to Lossiemouth from a 'radar to visual' approach.

ATSI reports that this Airprox occurred in Class G airspace, in the vicinity of Helicopter Main Route (HMR) X-RAY. This HMR is bi-directional between Aberdeen and Wick and though HMRs have no lateral dimensions, over the Northern North Sea (between the 55° & 62° parallels), the vertical limits are 1500ft amsl to FL85.

The AS332 crew contacted Aberdeen APPROACH at 1217:50, whereupon the flight was allocated a squawk of A3667 and instructed to squawk 'ident'. Whilst in the process of identifying the ac the APR spotted pop-up traffic ahead of the AS332 on a reciprocal track so immediately transmitted at 1218:20, *“...you're identified just coasting in...traffic in your twelve o'clock range of 5 miles fast moving indicating 1300 feet unverified straight at you turn left heading 090°.”* The AS332 pilot read back the heading instruction immediately, whereupon he was informed that a RAS was being provided and the APR added at 1218:40, *“...that traffic...just to the south of you by about 2 miles indicating 1800ft unverified”*. This was followed, shortly before 1218:50, by *“that traffic turning to the west now just...brushing alongside you”*, whereupon the pilot commented he was flying in IMC. The APR then advised *“...he's just passed you now tracking toward the north-west indicating 3000 feet...”*

The Aberdeen APR detected the 'pop-up' traffic in potential conflict with the AS332, as it was being identified and reacted swiftly by instructing the crew to turn left but without the use of the term 'avoiding action'. It is considered, that here, when immediate action was required to try and resolve the conflict, the use of the avoiding action phraseology would have been appropriate. However, in the circumstances, the possibility of obtaining 5nm horizontal separation, due to the disparity in the acs' performance, was unlikely. Having issued the turn, there was nothing further the controller could do to resolve the conflict other than to update the helicopter pilot of the position of the unknown ac, which she did. A vertical solution would not have been feasible as it would have been impossible for the helicopter to outclimb the Hawk.

MIL ATC OPS reports that the Lossiemouth RT transcript is 52sec ahead of the radar recording and has, therefore, been corrected to UTC. The AS332 crew called the Lossiemouth LARS (LARS) Controller at 1203:44, *“...just lifted off the Beatrice Alpha presently at 1000ft 1019 like a climb please to 2000ft to route direct to Aberdeen for an IFR approach”*. The ac was identified, instructed to climb report level 2000ft, placed under a RIS at the crew's request at 1204:24, which was 'limited' at the base of radar cover. The flight was duly pre-noted to Aberdeen as an IFR inbound estimating Aberdeen at 1229. Later, the AS332 crew requested approval to climb to 2500ft and reported level at 1213:09; the new altitude was relayed to Aberdeen. At 1217:20, the AS332 crew was instructed to *“...continue with Aberdeen 119x05..”*. However, the crew recalled LARS at 1220:42, to enquire whether LARS was

"...controlling traffic a fast moving aircraft...that's just passed us climbing through our level". LARS reported *"..negative there's no other radar contact on my screen at present".* The AS332 crew expressed some surprise at this, however, LARS explained that *"...at that rangewe don't see aircraft until approx 2500ft".* A subsequent landline call between the Lossiemouth SUPERVISOR and Aberdeen ATC revealed that the conflicting ac was the subject Hawk. However, the controller *"..didn't see anything at all from SMOKI onwards".* SATCO reported that the Hawk called Lossiemouth APPROACH for recovery at 1220:14, some 3 minutes after the AS332 switched to Aberdeen.

Neither flight was in receipt of an ATS nor on a Lossiemouth frequency at the time of the occurrence, thus there is no Mil ATC involvement in this Airprox.

UKAB Note (1): The Aberdeen Radar recording shows the AS332 flying southbound towards Aberdeen passing about 4nm W of SMOKI slowing converging on HMR X-Ray. At 1217:19, the helicopters SSR code is changed from A3722 (as allocated by Lossiemouth) to A3667 and 'idents' as the ac passes W abeam Banff indicating 2300ft Mode C (1013mb) - equating to about 2570ft QNH (1022mb) – which is broadly maintained throughout the encounter. The Hawk, squawking A7001, is first shown on the recording at 1218:04 as a 'pop-up', northbound climbing through 900ft unverified Mode C (1013mb) during the low-level abort, after turning L from the easterly IP target run toward Turriff reported by the QFI. The jet climbs steadily through 1100ft some 3½nm S of the helicopter at 1218:20, the time that the APR first called the Hawk to the AS332 crew, the latter's ac momentarily indicating 2400ft Mode C at that point. The APR's avoiding action left turn is seen to take effect some 20sec later as the AS332 steadies eastbound and at 1218:45, the contacts merged - the AS332 maintaining 2300ft as the Hawk climbed through 2200ft unverified Mode C indicating 100ft beneath the helicopter's level. Thereafter, the Hawk turns sharply L and continues the climb into Class F airspace toward the coast; the jet's A7001 squawk is changed to a Lossiemouth squawk at 1220:57.

UKAB Note (2): The UK Mil AIP at ENR1-15-1, stipulates that HMRs have no lateral dimensions, and the En Route Supplement BINA at pg196, reiterates that, *"Military operations are normally conducted at or below 1000ft amsl or above FL85 and with due regard for civil helicopter operations when crossing HMRs".*

THE HAWK T1 PILOT'S STATION comments that this Airprox occurred during a low-level abort procedure. The Hawk crew did not contact Lossiemouth ATC until after the Airprox had occurred, but it is most unlikely that they would have been able to establish RT contact earlier, during the climb from 250ft msd to their planned safety altitude because of terrain masking.

HQ PTC comments that the Hawk QFI found himself in an unenviable position, which is difficult to judge without having been there. The deteriorating weather dictated a weather abort. Not to have done so could have given his student a poor lesson, despite the fact that they were about to coast out. He was too far from Lossiemouth and too low for ScATCC (Mil) to help him out immediately and he was on 'bingo' fuel – all a common fast-jet dilemma. He was well aware of the ADR above him and prepared to take account of it in his climb, but having seen the AS332 below it late, the Hawk student took prompt and appropriate avoiding action.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Controller members not familiar with this locale were concerned that the AS332 was at an altitude of 2500ft QNH, when the crew had reported that they were flying in IMC with nil forward visibility. It appeared as though they were intentionally flying below the promulgated 25nm safety altitude for

AIRPROX REPORT No 127/03

Aberdeen - 4100ft Aberdeen QNH when approaching from this quadrant. However, a helicopter pilot member intimately familiar with offshore operations explained that the company SOP permitted a safety altitude of 2500ft in that position, despite commercially available charts and the UK AIP suggesting that higher altitudes were more appropriate. Furthermore, the ATSI advisor stated that 2500ft was a frequently used vectoring altitude for an IFR approach, adding that the crew were not flying on the HMR, but routing direct to Aberdeen from the rig. Evidently, the AS332 crew had chosen to climb from 2000 – 2500ft RPS whilst under a RIS from Lossiemouth and had only just switched to Aberdeen APPROACH less than 1 min before the Airprox occurred. This was indeed fortunate as the better radar cover available to the Aberdeen APR in this area had allowed her to detect the Hawk in time to issue a warning and an avoiding action L turn away from the climbing jet. Members were in no doubt that the APR had acted wisely and commended the controller for her swift appreciation of the developing situation and the adept application of positive avoiding action when confronted with an inherently unpredictable situation at close quarters. There was little else that could be done in the short time available, apart from the continued transmission of traffic information, but she was not aware that the crew were IMC until a little later. Nevertheless, her priorities were correct in turning the helicopter out of the way first and applying the service afterwards. Controller members agreed that the signally important “*avoiding action*” phrase should have been included here, but she got the AS332 crew’s attention in time – but only just - as it was evident that this was a close call with little time before the radar contacts had merged. From the Mil ATC Ops report it was clear that the radar cover available to Lossiemouth at these levels did not encompass this vicinity and the LARS controller had not detected the Hawk at low-level before the AS332 crew had switched to Aberdeen, thus LARS was unaware of the jet closing on the AS332 until after the occurrence.

In the other cockpit, the Hawk crew was not so well placed for immediate assistance from ATC when they started to encounter deteriorating weather. Clearly there was a fine balance to be struck on instructional sorties between allowing the student to complete pre-briefed aims and knowing just when to change the plan if circumstances dictated. Here the QFI said he had sufficient fuel to complete the last target run and achieve a visual recovery to Lossiemouth, but once poor weather was encountered this evidently inhibited his available choices. He reports that neither a turn E nor W was an option once northbound ‘off target’ toward Banff. However, if he had allowed his fuel state to diminish to the point that turning back rather than continuing N was not an option either, then fast-jet Board members believed that he had left his decision to abort too late. The STC member questioned why the QFI had elected to ‘press on’ into bad weather when the outcome would inevitably be a weather abort – by continuing he had placed himself in an awkward situation which dictated the subsequent turn of events. The salutary lesson here is to take early and positive action – *Don’t press on, turn away or pull up earlier!* Had this advice been applied at a closer range to Lossiemouth (it was pointed out that they had flown past the aerodrome a few minutes beforehand) it would have left more options available. But indecision in the deteriorating weather had left no other option than to execute a weather abort, necessitating a climb in IMC through cloud at 350kt to safety altitude without radar assistance to advise if the way ahead was clear, which it was not. By chance the Hawk crew broke cloud and saw the helicopter, in their R 1 o’clock turning away. This was apparently before the AS332 crew had steadied on E and the student initiated the avoiding action left turn as they passed - he thought - 500yd behind the helicopter at the closest point, in a climbing attitude. As it was, the Aberdeen radar first detected the Hawk at 900ft Mode C (1013mb) – about 1170ft amsl - and throughout its climb through another 1300ft over a track distance of marginally under 5nm. This climb profile hardly seemed to the Board to be a classic weather abort, nor did it replicate the 30° nose-up climb reported by the Hawk pilot before the contacts merged. Indeed the recording showed a steeper climb after the event – 3800ft over 5nm – after the student’s avoiding action L turn. This turn had been effective but the jet had passed closer than the 500yd [$\frac{1}{4}$ nm] reported. It was unfortunate that the Hawk crew had not been able to call ScATCC (Mil) in the short time available, also with the advantage of the Aberdeen radar head available to them. ScATCC (Mil) might have been able to offer a radar pick-up whilst climbing out from low level prior to a handover to Lossiemouth. However, fast-jet members were quick to point out that the QFI had prioritised correctly, with a climb on a heading away from high ground to above safety altitude being the most vital action. As it was, the Hawk encountered the AS332 in the vicinity of an HMR, which they were quite likely to do. Mistakenly,

the QFI had reported that he was cognisant of the ADR from 3500ft, but reported the designator shown on the LFC as "X-RAY" – in actuality that of the HMR. This led some members too conclude that the QFI was unaware of the HMR and the associated probability of encountering helicopters along this route – normally above 1500ft ALT. But it was also mentioned that the depiction of the HMR & ADR on the LFC was not at all clear, a point that had been raised previously with the editors of the En route Chart series for Airprox 104/02 by STC, who agreed to investigate a similar amendment to the LFC. Despite much potential for a more serious outcome, it was evident to the members that the avoiding action provided by the APR, coupled with the Hawk crew's sighting and subsequent avoiding action had been effective. In the Board's view this Airprox had resulted from a conflict in IMC, in Class G airspace, between the AS332 that was receiving a RAS from the Aberdeen APR and the Hawk that was aborting from low level. Furthermore, the radar recording had evinced a much closer encounter than that suggested by the Hawk QFI's report, which had gone unseen by the helicopter crew in IMC while turning away under the instructions of the Aberdeen APR. Nevertheless, the Hawk crew had managed to spot the AS332 out to the R at a critical moment apparently just before passing astern of it, which coupled with their avoiding action L turn had narrowly prevented a possible collision. Therefore, the Board was unanimous in concluding that the safety of these two ac had indeed been compromised.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in IMC, in Class G airspace, between the AS332 that was receiving a RAS from the Aberdeen APR and the Hawk that was aborting from low level.

Degree of Risk: B.

AIRPROX REPORT No 128/03

AIRPROX REPORT NO 128/03

Date/Time: 14 Aug 0945

Position: 5418N 00109W (N York Moors
Nr Bilsdale)

Airspace: UK DLFS LFA 11 (Class: G)

Reporting Ac Reported Ac

Type: Bo105 Tucano T1

Operator: Civ Comm HQ PTC

Alt/FL: 280ft agl 250ft
(QNH 1021 mb) (RPS)

Weather VMC VMC

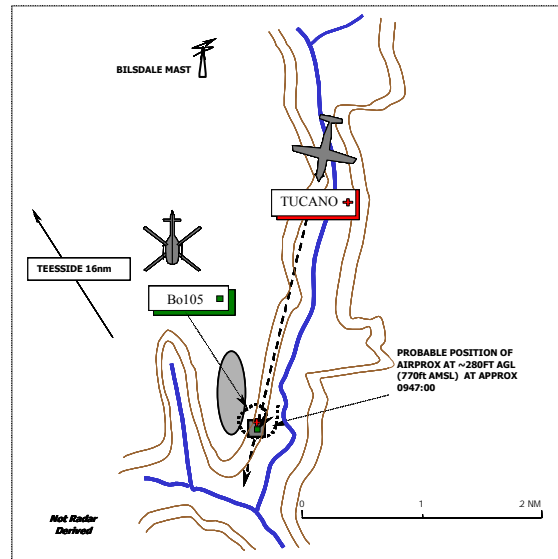
Visibility: >10 km N/R

Reported Separation:

100m H 50-100ft V Not seen.

Recorded Separation:

NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BO105 PILOT reports flying a green and white helicopter on an air ambulance emergency mission to an isolated farm in the N York Moors. TCAS was not fitted. He had strobes and anti collision lights selected on, was squawking 0020 with Mode C and had been in receipt of a FIS from Teesside 16nm to the N, but had lost RT contact due to the high terrain and because he was in a spiral descent to land in a farmyard. While passing through a heading of 200° at 80kt with all his crew concentrating on wires/obstacles which would affect his landing and subsequent take-off, he spotted a dark blue Tucano ac about 200m departing to his 1 o'clock just above his height, having overtaken him, while he conducted the spiral descent.

He had extensive police and air ambulance low-level flying experience in the N of England, was well aware of the various lower airspace users in the area and was aware that the valley where the farm was located was a prime route for RAF training since it skirts the Leeming/Dishforth area.

HEMS helicopters at low level are usually looking to land, usually in ad hoc sites and although they are carefully recce'd for hazards, lookout beyond the immediate area is interrupted. Due to the remoteness of many accidents that the helicopters attend, radar cover is poor and for many Air Ambulance tasks 'see and avoid' is the only protection but in these circumstances can be inadequate.

THE TUCANO T1 PILOT reports flying a black and yellow ac with HISLs and landing lights selected on, instructing a student pilot on a low flying sortie flying visually at 250ft agl not in receipt of an ATC service but listening out on the LFS frequency. No CWS was fitted. His report was in response to an Airprox filed by the civilian medical helicopter, which he did not see. At the reported time and position of the incident he was heading in a southerly direction down the River Seph valley at 240kt and was re-instructing the student on valley flying while integrating LL Nav techniques.

Neither the student nor the instructor saw the civilian helicopter and were not pre warned of its presence in the area.

UKAB Note (1): Although some of the lead up to the incident is recorded on radar, the actual Airprox is not seen on either the Claxby or Great Dun Fell radar recordings. Further, since the Tucano pilots did

not see the helicopter, the only sighting of the event and note of the miss-distance is that stated in the Bo105 pilot's report.

HQ PTC comments that the Tucano was involved in a legitimate low-level training sortie operated at its authorised MSD. As (worryingly) neither Tucano pilot saw the helicopter there can be no validation of its pilot's perception of the miss-distance. When trialled on other Tucanos, TCAS was found to operate perfectly satisfactorily in such valleys.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board was very concerned that neither crew had seen the other ac during the conflict. In the case of the Bo105 crew, they saw the Tucano after the event and in the case of the Tucano, not at all. It was therefore only by chance, that a collision had not occurred.

Members tried to determine why this had been the case. Regarding helicopter operations, experts described the task and workload of the crew of a small helicopter landing at a remote, unfamiliar location. Members were informed that at the time of the final approach all available eyes would be directed towards the landing area and that routine lookout in other sectors would necessarily be degraded. In this situation they agreed that some form of Traffic Alerting equipment would be an invaluable aid to the pilot by providing him with a warning of any SSR equipped approaching ac and allowing him to redirect lookout to that direction and, if required, take appropriate avoiding action.

It was harder to analyse why the Tucano crew had not seen the helicopter in their 11-1 o'clock lookout sector. Subsequent conversation with the QFI concerned confirmed the Board's assumption that the student pilot had been in the front seat and was on an early low-level instructional sortie. He would therefore, also have been in a high-workload situation concentrating on keeping his separation from the ground and navigating the ac. The instructor's lookout from the rear seat, particularly in the low area of the forward sector, would have been severely degraded in level or slightly descending (down the valley) flight. Moreover, he was probably focusing much of his attention on monitoring his pupil's flight path rather than looking for other ac ahead and above.

Since there were no other accounts to assist and to corroborate the Bo105 pilot's report, the Board tried to analyse the precise geometry of the incident. They had no reason to disbelieve what had been reported and if the Bo105, reported at 280ft agl, was even slightly lower than the Tucano (and had been as they approached), this could explain why the helicopter was not seen by the Tucano crew as it would have been below the ac's long nose. Further, they would not have expected to encounter any other traffic below their height. What was worrying was how the helicopter had descended into that position unseen.

Nevertheless, the crews of both ac had an obligation to see and avoid, and neither did, while both were in high workload situations and concentrating on other priority tasks.

Had one, or preferably both, ac been equipped with a Traffic Alerting system it is probable that this Airprox would not have happened. In order to prevent such incidents, the Board unanimously agreed that if both HEMS operators and MOD fitted such equipment to their ac, safety would be greatly enhanced.

Good fortune had, on this occasion prevented a mid-air collision.

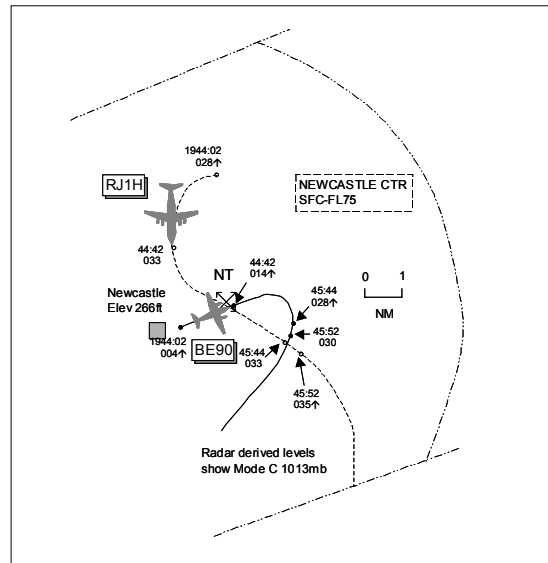
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A non-sighting by the crews of both ac.

Degree of Risk: A.

AIRPROX REPORT NO 129/03

Date/Time: 14 Aug 1946 TWILIGHT
Position: 5502N 0135W (3.5nm E of Newcastle - elev 266ft)
Airspace: CTR (Class: D)
Reporting Ac Reported Ac
Type: RJ1H BE90
Operator: CAT Civ Comm
Alt/FL: 3500ft 3000ft↑
 (QNH 1019mb) (QNH 1019mb)
Weather VMC CLBC VMC CLOC
Visibility: 30km >10km
Reported Separation:
 300ft V NK H 500ft V 2nm H
Recorded Separation:
 500ft V 0.55nm H

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

THE RJ1H PILOT reports following a go-around on RW07 Newcastle, owing to a hydraulics problem, TOWER cleared him to climb straight ahead to 2500ft. On transfer to APPROACH, climb clearance was given to 3500ft with a L turn and then he was transferred to DIRECTOR who cleared him to enter the NT NDB hold. Just before entering the hold heading 100°, DIRECTOR informed him that an ac was departing Newcastle climbing to 2500ft, but on passing the NDB he noticed on TCAS the ac, which was on another radio frequency, climbing rapidly through its altitude just below his ac. Simultaneously with ATC asking him urgently to turn R onto heading 270°, he thought, TCAS gave an RA “climb, climb”. He disconnected the A/P and autothrottle and climbed the ac, with the conflicting ac indicating -300ft, he put his v/s into the TCAS demanded ‘green band’, and started a gentle turn with 10-15° AOB. He told ATC of his TCAS climb to 4500ft, who recleared him to climb to FL60 and gave vectors to remain clear of the departure area. He assessed the risk of collision as medium.

THE BE90 PILOT reports flying outbound from Newcastle to Paris IFR and in receipt of an ATS from Newcastle APPROACH on 124.37MHz squawking an assigned code with Mode C. The initial clearance given by the TOWER controller was to climb to 3500ft and, on transfer to APPROACH, he was told again to climb to 3500ft; he acknowledged ‘tree thousand five hundred feet’. When approaching 3000ft heading 200° at 140kt, ATC asked him to stop climbing and he saw traffic to his L about 2-3nm away and 500ft higher. He assessed the risk of collision as none.

UKAB Note (1): Met Office archive data shows the Newcastle METAR as EGNT 1950Z 09001KT 9999 FEW020 14/08 Q1020=

ATSI reports that the RJ1H was on final approach and had been cleared to land on RW07, when the crew reported going around due to a hydraulics problem. The ac was cleared to climb to an altitude of 2500ft and then it was transferred to the Newcastle Radar controller, who instructed the crew to climb to 3500ft and take up the hold at the NT (an NDB located on a 1nm final to RW25). The ac was then transferred to the Newcastle Director’s frequency.

Meanwhile the BE90 was taxiing for departure, and had been passed a clearance of “...initially climb straight ahead to flight level six zero squawk six three four six”. This was read back as “Straight ahead six thousand feet six three four six the squawk....”. The ADC did not correct this error.

AIRPROX REPORT No 129/03

Once the BE90 was airborne, the ADC transmitted at 1943:49 *“BE90 c/s stop the climb altitude two thousand five hundred feet on the QNH”*. The pilot replied *“Three thousand five hundred feet we stop BE90 c/s”*. Once again, this was not corrected but analysis of the RT recording does reveal that the pilot had a strong accent. Shortly afterwards the BE90 pilot was instructed to contact the Newcastle Radar controller.

The BE90 pilot established communication with the Newcastle Radar controller at 1944:44 and reported *“...climbing three thousand five hundred feet”*. The Radar controller replied, *“...maintain two thousand five hundred feet on reaching traffic that went around er ahead of you is a thousand feet above you at the moment”* to which the pilot of the BE90 responded, *“Maintaining two thousand five hundred BE90 c/s”*. This was clearly and accurately read back. The BE90 was then given radar headings and, at shortly after 1945:43, the Newcastle Radar controller, seeing the flight continue above 2500ft, transmitted, *“BE90 c/s stop your stop your climb immediately altitude three thousand feet there is traffic five hundred feet above”*.

[UKAB Note (2): The Newcastle Approach Radar RT transcript shows the BE90 replying *“visual er no problem”*. The Radar controller responds *“ roger you were clear to altitude two thousand five hundred feet”* to which the BE90 replies *“I had er three thousand five hundred two time I said it”*.]

At about the same time, the Newcastle Director also noticed that the BE90 had climbed above its cleared level and so transmitted, *“RJ1H c/s turn right right heading two five zero emergency turn right right two five zero”*. The crew of the RJ1H correctly acknowledged this instruction and shortly afterwards they were instructed to climb to FL60.

[UKAB Note (3): The Newcastle Director RT transcript reveals that after the RJ1H pilot's acknowledgement the Director transmits *“there's traffic just underneath you has gone through his level he's er four hundred feet beneath you he's six o'clock range one mile er stop the right turn now heading two hundred two hundred the new heading”*. The RJ1H pilot responds *“heading two hundred RJ1H c/s we are climbing to four thousand five hundred”* which the Director acknowledges and issues climb clearance to FL60.]

It is disappointing to note that the ADC did not detect two incorrect read backs from the BE90 pilot. Furthermore, the Newcastle Director did not use standard 'avoiding action' phraseology when attempting to resolve the conflict. Given that English was not the first language of the two crews involved, the importance of standard phraseology in such circumstances cannot be over stressed.

UKAB Note (4): Analysis of the Great Dun Fell radar recording at 1944:02 shows the BE90 just airborne from RW07 indicating FL004 (580ft QNH 1019mb) with the RJ1H 4.1nm to its N in a L turn passing 260° indicating FL028 (2980ft QNH) climbing. Forty sec later the RJ1H is passing through heading 180° 2.25nm N of Newcastle level at FL033 (3480ft QNH) with the BE90 passing SE abeam the NT NDB indicating FL014 (1580ft QNH) climbing. The RJ1H steadies on a SE track at FL033 until the CPA occurs at 1945:44 as it crosses through the BE90's 12 o'clock range 0.55nm as it climbs through FL028 (2980ft QNH) whilst still turning R through heading 190°. The next radar sweep 8 sec later shows the RJ1H indicating FL035 climbing and diverging from the BE90 which crosses through its 7 o'clock range 0.65nm passing through heading 200°, having just stopped its climb at FL030 (3180ft 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.

The ATSI advisor reiterated the fact that the BE90 pilot had a strong foreign accent and members endorsed the comment that the use of standard phraseology was particularly important when English was not the first language of the flight crew. Although the Newcastle ADC did not detect two incorrect readbacks from the BE90 pilot, the APR heard the Beech pilot's initial call “..*climbing to 3500ft*” and told him to maintain 2500ft on reaching, which was correctly read back. Some members thought that the APR could have gone further and should have emphasised the instruction to “*stop climb*” thereby reinforcing the ‘stop off’ element to help prevent what happened next. The BE90 pilot was seen to climb through 2500ft, the level he had acknowledged and this had caused the Airprox.

The APR had passed TI to the BE90 pilot on the RJ1H 1000ft above, during his initial call, but when he noticed the Beech climbing through its assigned level, he told its pilot to stop his climb immediately at 3000ft and passed further TI. The BE90 pilot had not assimilated the initial APR ‘stop off’ instruction. Instead he had continued climbing towards 3500ft, only levelling off when instructed to do so, and then visually acquiring the RJ1H 2-3nm away, he thought, to his L, 500ft above. The Newcastle Director also saw the Beech’s ‘level bust’ and gave the RJ1H pilot an ‘emergency’ turn and TI. Meanwhile, the RJ1H crew had been told by the APR of the departing BE90 climbing to 2500ft before transfer to the Director’s frequency. The crew noticed the potential confliction and, whilst executing the issued R turn, had received a TCAS RA ‘climb’ command, which was followed; he then informed the Director of what was happening, but omitting to say “*TCAS climb*”. Although ATC did not use the appropriate ‘avoiding action’ phraseology, the combined positive actions by all parties involved persuaded the Board that their outcome meant that any risk of collision had been effectively removed.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The BE90 pilot climbed through the level he had acknowledged.

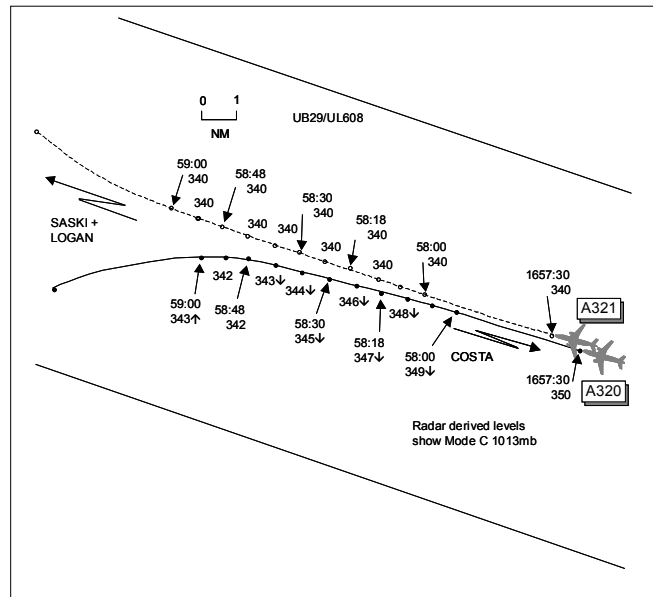
Degree of Risk: C.

AIRPROX REPORT No 130/03

AIRPROX REPORT NO 130/03

Date/Time: 17 Aug 1659 (Sunday)
Position: 5128N 0252E (14nm SE SASKI)
Airspace: AWY UB29/
UL608 (Class: B)
Reporter: LACC S13/14T

	<u>First Ac</u>	<u>Second Ac</u>
<u>Type:</u>	A320	A321
<u>Operator:</u>	CAT	CAT
<u>Alt/FL:</u>	↓FL310	FL340
<u>Weather</u>	VMC	VMC
<u>Visibility:</u>	NK	>10km
<u>Reported Separation:</u>	NR	200ft V 0.5-1nm H
<u>Recorded Separation:</u>	200ft V 1.2nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE LACC S13/14 TACTICAL CONTROLLER reports that the A320 and A321 were both routing from COA to LOGAN, the A320 was 1000ft above and directly overhead the other Airbus. Believing that the A320 was below the A321, he cleared the A320 to descend to FL310 from FL350 and gave it a radar heading to split the two ac radar returns. He noticed his mistake as the A320 was descending through FL345 approaching the A321 at FL340 and gave avoiding action. Both ac received TCAS RAs, he thought, and the A320 was seen to reach FL343 before stopping its descent and commencing climb.

THE LACC S13/14 PLANNER CONTROLLER reports training a student and both had been involved in attempting to coordinate traffic with S12 prior to transfer. He was then trying to resolve a coordinated level query with S2P when his S13/14 Tactical controller was seen to give avoiding action to the relevant ac after noticing a mistake. He immediately terminated the call and assisted his Tactical controller with his task until he was relieved from duty.

THE A320 OPERATOR was contacted 3 weeks post incident and again 6 months later but no report was received at UKAB.

THE A321 PILOT reports heading 287° at M0.79 inbound to Heathrow and in receipt of an ATS from London. TCAS indicated traffic behind his ac routing in the same direction, above his level and descending, which then flew within +200ft and 0.5-1nm of his ac causing the generation of an RA warning before it appeared to then diverge to his L as 'clear of conflict' was received. ATC told them to turn onto 360° and then L onto 295° before normal routing was established and he reported the RA warning to ATC. The conflicting ac was not seen visually. He heard the controller ask another ac (the subject A320) whether they had received an RA alert but their crew reported receiving only a TA alert.

UKAB Note (1): The LACC S13/14T RT transcript at 1702:10 show the S13/14T asking the A320 crew "...did you get a TCAS er warning earlier". The A320 pilot replies "it was just a TA advisory A320 c/s and er visual with the other traffic when we got the TA".

ATSI reports that at the time of the Airprox, both ac were under the control of the LACC S13/14 Tactical controller (S13/14T). Both the workload and traffic loading were described as 'Medium'.

The A321 was en route from Vienna to Heathrow cruising at FL 340 and its crew established contact with the S13/14T at 1653:45 and were informed that they could expect a LAM3A arrival at Heathrow. The crew of the A320, en route from Malta to Heathrow, reported on frequency at 1654:35, advising that they were maintaining FL350 and inbound to COSTA. They too, were told to expect a LAM 3A arrival at Heathrow. At the time the A320 reported on frequency, its position was 4.6nm S of the A321, on a converging track.

Nearly 3min later, at 1657:30, the controller transmitted *“A320 c/s fly heading two eight five descend now flight level three one zero”* and this was correctly read back. The purpose of this heading was to place the two ac on diverging tracks thereby ultimately establishing lateral separation. At the time the crew of the A320 were reading back this instruction, their ac was positioned in the 7 o'clock position of, and 1nm from, the A321 which was 1000ft beneath them. Thus, as soon as the A320 vacated FL350, standard vertical separation was eroded.

The S13/14T was alerted to the conflict by the activation of STCA and, at 1658:15, he transmitted: *“A321 c/s turn right heading three one zero”*. There was no response to this transmission and so he repeated it, again without response. At 1658:30, he transmitted: *“A320 c/s avoiding action turn left heading one eight zero”*. At that time, the ac was 1.2nm behind the A321 and passing FL344 in its descent. The A320 crew acknowledged the instruction and also reported the traffic in sight. The controller then transmitted *“Just stop the descent climb flight level three five zero”*. The crew of the A320 acknowledged this and stopped their descent at FL342. At 1658:45 the controller said *“clipped A321 c/s avoiding action turn right heading three six zero”*. The crew acknowledged this and also reported that they had received a TCAS RA. Separation reduced to a minimum at 1658:48, when the A320 was 1.2nm in the seven o'clock position of the A321 and 200ft above it. Standard separation was restored at 1659:34, when 5nm lateral separation was achieved between the two ac with the A321 still maintaining FL340 and the A320 climbing through FL345.

The Tactical controller reported that soon after the two ac had reported on his frequency, he had moved the Track Data Block (TDB) of the A321 on a displaced strut. This, he commented, enabled him to see the relevant radar data as his action had separated the TDBs from their previously overlapping positions. The radar recording confirms that the 'new' positions permitted the TDBs of the subject ac to be read clearly, the A321's, at FL340, above and slightly to the left of the A320's, at FL350, as viewed on the radar. The controller's paper flight strips were arranged in time order, the A320 showing a time at LOGAN of 1706 and the A321 1705, and were thus in the correct level order with the A320 strip being immediately above that of the A321.

The controller advised that he believed he had checked his radar and reviewed his strips prior to issuing the descent clearance to the A320. Despite this, he descended the wrong flight. The strips show the descent clearance was written on the correct strip, i.e. that of the A320, the flight at the higher level.

Immediately prior to the activation of STCA, the Planner and his trainee were discussing details of traffic being offered by another sector. The Tactical controller confirmed that he was not involved in this conversation and did not believe that it was a distraction but he could offer no explanation as to why he had descended the higher ac. There was discussion as to whether the positioning of the TDBs had been a potential source of confusion. However, the Tactical controller was unable to say for certain whether or not this had been the case. Looking at the radar recording, the information within the TDBs is clear but, if not carefully assimilated, it is assessed that it could have been misinterpreted. Both the TDBs are located to the NW of the radar return but the strut, associated with the A321, lies due N of the relevant return and so bisects the TDB of the A320. In such circumstances, it may have been more prudent to place greater reliance on the flight progress display and to have issued clearances based on that flight data.

The instruction to the A321 crew to turn R onto 310° was not prefixed “avoiding action” nor was the instruction to the A320 crew to stop its descent and climb back to FL350. The controller explained that

AIRPROX REPORT No 130/03

this had been due to the pressure of the moment; he was aware of the correct phraseology and had practised it in TRUCE. He went on to say that he had been concerned that the A321 did not appear to be responding to his initial heading instruction, nor reacting to its TCAS as the Mode C remained at FL340, even though the crew later reported they had received 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 authorities.

Members were shown photos of the radar display before and after the S13/14T had moved the TDB attached to the A321, which created a strut passing through the TDB of the A320. Both TDBs were legible and both were positioned vertically above their respective target symbols; that of the A321 at FL340 placed N of the A320 at FL350. With the TDBs so positioned – the lower ac above the higher one – a casual glance might then give an erroneous impression. For whatever reason the S13/14T did not assimilate the subject acs' true levels, despite being correctly shown both on the radar and flight progress displays, when he descended the A320 into conflict with the A321. This had caused the Airprox. One possible reason put forward was that in a momentary lapse of concentration the controller had taken the TDB disposition at face value without checking his correctly annotated fpss, an 'aide memoir' that should have alerted him to the true traffic 'picture'. However, this explanation was conjecture.

Turning to risk, STCA alerted the S13/14T to the conflict but in response his turn instruction, issued twice to the A321 crew, went unanswered. The A321 crew had reported seeing the A320 on TCAS, behind their ac, descend to just 200ft above their level about 0.5-1nm away before receiving an RA warning followed by "*clear of conflict*"; the crew only reported hearing the avoiding action R turn onto heading 360° after the TCAS RA warning. Meanwhile, the controller had focussed on resolving the conflict by giving an avoiding action L turn to the A320 crew, which was acknowledged, followed by an instruction to stop descent and then to climb back to FL350. The A320 crew reported being visual with the A321 below them and receiving a TA alert. Airline members thought the A320 crew could have exhibited better situational awareness. The A321 was just ahead and below them and would have been showing clearly on TCAS; there had been plenty of opportunity to challenge the descent clearance issued by ATC before going down. The radar recording showed the subject ac flying at similar speeds but crucially with no overtake and diverging slowly. Although singularly untidy, these elements when taken in sequence did not constitute any risk of collision and were enough for the Board to conclude that safety had remained intact during the encounter.

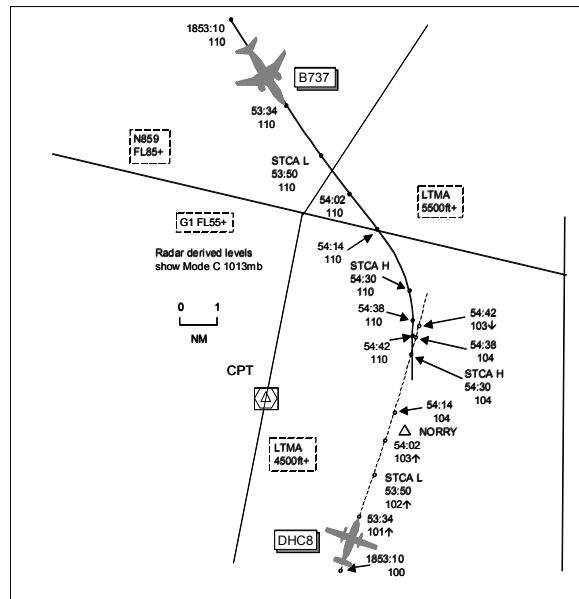
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The LACC S13/14 Tactical controller descended the A320 into conflict with the A321.

Degree of Risk: C.

AIRPROX REPORT NO 131/03

Date/Time: 15 Aug 1854
Position: 5131N 0107W (4nm NE CPT)
Airspace: LTMA (Class: A)
Reporter: LTCC NW SC
First Ac Second Ac
Type: DHC8 B737-200
Operator: CAT CAT
Alt/FL: ↑FL110 FL110
Weather VMC CLOC VMC CLOC
Visibility: >20km
Reported Separation:
NR 700ft V nil H
Recorded Separation:
600ft V 0-15nm H

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

THE LTCC NW SC reports that the Sector was bandboxed when the B737 pilot called on frequency and reported flying on a radar heading. He issued descent clearance to FL110 to be level at CPT, leaving the ac on its heading but later realised he should have put it on its own navigation to CPT. He then issued climb clearance to the DHC8 pilot from FL100 to FL110, keeping this ac underneath another ac, but forgot about the B737. When he noticed the confliction and was about to give avoiding action descent, the DHC8 pilot reported he was TCAS descending.

THE DHC8 PILOT reports flying outbound from Southampton approaching WCO, he thought, climbing to FL110 when TCAS gave a TA alert whilst climbing through FL104 which immediately became an RA 'descend' warning. The FO, PNF, visually acquired a B737 immediately and, as the Capt, PF, commenced descent following the TCAS guidance, ATC gave descent clearance. He assessed the risk of collision as low.

THE B737 PILOT reports flying inbound to Bournemouth level at FL110 at 320kt and in receipt of an ATS from London. He received a TCAS TA alert on traffic at range 5nm indicating -700ft, steady, which was sighted as a DHC8. He maintained his level and watched the traffic pass beneath him whilst following ATC radar headings. He assessed the risk of collision as nil.

ATSI reports that when the SC took over the NW Sector, some 18min before the incident occurred, the sector was already bandboxed. He commented that a controller was available to split the sector if it had been necessary but he considered that the medium traffic loading at the time was well within his capabilities. However, subsequently, due to an expected short-term increase in traffic, he had requested the assistance of a colleague. Rather than split the sector, for what he anticipated would only be a short time, he decided to staff it in a 'man and boy' configuration and this was accomplished prior to the Airprox.

The B737 pilot established contact with the NW Sector at 1847, reporting level at FL150, in accordance with the Standing Agreement between that sector and TC Cowly, on a heading of 145°. The SC commented that it had taken him a few seconds to establish the ac's position as it was near the edge of his radar display. He then cleared the ac to descend to FL110, the Standing Agreement level for transfer

AIRPROX REPORT No 131/03

to the TC Ockham (OCK) Sector, to be level 10nm before CPT. In accordance with standard operating practice, his intention had been, once it was established that there was no conflicting traffic, to place the flight on its own navigation to CPT. In the event, this did not take place and no further transmissions were made to, or received from, the flight until the incident occurred.

The DHC8 pilot made his initial call on the frequency at 1853, i.e. 5min after the B737 had been cleared to descend to FL110, reporting his routeing to NORRY at FL100, the Standing Agreement level from TC OCK and was cleared to climb to FL110. The SC explained that this clearance was in respect of an ac that was SW bound at FL120 and confirmed that it did not take the B737, which was maintaining FL110, into account. The radar, timed at 1853:10, as the pilot of the DHC8 responds to the climb clearance to FL110, shows his ac tracking to NORRY at FL100, whilst the B737, which is on a conflicting track, is 14.7nm to its NNW. The controller said that he could not explain why he had overlooked the presence of the B737, especially as its SSR label was showing, uncluttered, on the radar display and its fps, correctly annotated, was in position in the same bay as the DHC8's. He added that, if he had carried out his intention to route the B737 to CPT, rather than leaving it on its radar heading of 145°, lateral separation would probably have been maintained. (CPT is situated approximately 3.5nm WNW of NORRY.)

The SC said that he had become aware of the situation when alerted by his colleague, who had plugged in alongside him and had noticed the conflict whilst assimilating the traffic. Additionally, at about this time, STCA activated with a low severity alert (1853:49). Radar recordings reveal that the two ac were still on conflicting tracks and were now 8.4nm apart, with the DHC8 climbing through FL102. The SC immediately instructed the B737 crew to turn R heading 215° and, once the pilot had read back the instruction, the DHC8 crew were given a R turn heading 045°. This was followed by a further R turn to the B737 crew, heading 260°, together with information about traffic on their LHS, after which the pilot reported visual. The DHC8 crew were then instructed to descend immediately to FL100, whereupon the pilot reported reacting to a TCAS descent (1854:30), as the STCA changed to a high severity alert. None of these instructions contained the words 'avoiding action'. The radar recording of the incident shows that the DHC8 levelled at FL104 for just under 30sec, only descending after the B737 had passed.

[UKAB Note (1): The CPA occurs between radar sweeps with the subject ac passing abeam by an estimated 0.15nm between 1854:38 and 1854:42, the B737 maintaining FL110 and the DHC8 indicating FL104 and FL103 on the two consecutive radar responses.]

The SC agreed that it would have been appropriate to use the term 'avoiding action' to both flights as he tried to resolve the conflict. However, he could not explain why he had not used the phrase, despite having carried out a complete TRUCE session on that topic. When asked if he considered that high workload contributed to this incident, the SC was adamant that it was not a factor.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members commended the NW SC for his frank and honest report. He had noted the expected short-term increase in traffic and had elected to cope in 'man and boy' mode. However, members could see no reason that would explain why the controller had overlooked the presence of the B737 when he climbed the DHC8 into conflict. His actions had caused the Airprox. Although adamant that a high workload was not a factor, the SC had also not released the B737 on its own navigation to CPT, which had been his intention, to follow the standard operating procedure.

His colleague, 'the boy', had alerted him to the situation as STCA activated and the SC had attempted to resolve the confliction by turning both ac. With the benefit of hindsight, ATCOs thought the quickest way to resolve the problem would have been to stop the DHC8's climb from the outset but this option was eventually exercised later. Probably owing to a combination of the B737's speed and not using the appropriate 'avoiding action' phraseology, the R turns given did little to separate the subject ac, even after a further heading change was passed to the B737 crew. For their part the B737 crew had seen the potential confliction on TCAS at 5nm range and watched the DHC8 cross from R to L 700ft below. Likewise, the DHC8 crew had received a TCAS TA alert climbing through FL104, which quickly turned to an RA "*descend*" command; the FO visually acquired the B737 whilst the Capt, PF, followed the TCAS guidance. The prompt actions taken by the DHC8 crew resulted in their ac levelling off immediately and then passing 600ft below the approaching B737, which led the Board to conclude that any risk of collision had been effectively removed.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The LTCC NW SC climbed the DHC8 into conflict with the B737.

Degree of Risk: C.

AIRPROX REPORT No 132/03

AIRPROX REPORT NO 132/03

Date/Time: 3 Aug 1035 (Sunday)

Position: 5153N 0002W (10nm W of Stansted
elev - 348ft)

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

Reporting Ac Reported Ac

Type: ATR 42-300 PA31

Operator: CAT Civ Comm

Alt/FL: 3000ft 2400ft

QNH (1023mb) (QNH)

Weather VMC CLOC VMC CLOC

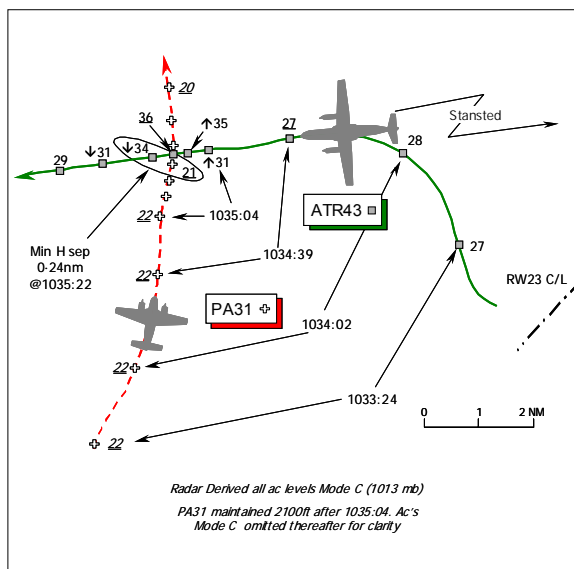
Visibility: 10km 10km

Reported Separation:

500ft-1000ft V/nil H 600ft V

Recorded Separation:

500ft V @ 3-6nm H 0-24nm H @ 1300ft V



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE ATR 43 PILOT reports that he had departed Stansted and was inbound to Luton, IFR, under a RCS initially from Essex RADAR on 120-62MHz. The ac has a white & blue livery and all lighting was selected on including the HISLs and landing lamps. Heading W at 200kt, flying in level cruise at 3000ft London QNH (1023mb), RADAR informed him of traffic at 11 o'clock but he could not remember the exact range [it was 8nm]. Looking out, no other ac was seen, whereupon TCAS enunciated a TA with "TRAFFIC TRAFFIC"; yet again nothing could be seen. Essex RADAR then instructed them to contact Luton DIRECTOR on 129-55MHz. Whilst the 1st Officer was selecting the Luton frequency, TCAS enunciated a "CLIMB" RA, which was complied with. Whilst climbing, conflicting traffic was seen to pass between 500-1000ft directly underneath from L-R at what appeared to be their previous cruising altitude. Once clear of the traffic – a low-wing white twin - a descent back to 3000ft was initiated. On initial contact Luton DIRECTOR was informed of the TCAS RA, whereupon he was advised that the conflicting traffic was squawking with Mode C and that it was maintaining 2400ft ALT beneath CAS. He assessed the risk as "high".

THE PA31 PILOT reports some 2 months after the Airprox, that his ac has a red, white & blue colour scheme and the anti-collision lights were on whilst in transit from Redhill to Glasgow, VFR, under an ATS from Luton DIRECTOR on 129-55MHz. He had earlier requested a CTR transit, which Luton had not granted, consequently he was under a FIS in Class G. Flying in level cruise at 2400ft London QNH (1023mb), passing E of Stevenage heading N at 170kt, DIRECTOR advised of another ac inbound to Luton at 3000ft ALT, which was spotted at a range of 2km. No avoiding action was necessary as the high wing twin passed 600ft above his ac and crossed 1nm away, obliquely astern he thought, from R - L. [The ATR actually passed ahead from R - L.] He added that he was visual with the other ac all the time and there was "no" risk of a collision.

THE LTCC LUTON DIRECTOR reports that the ATR43 had been co-ordinated with Essex RADAR to enter the Luton CTA positioning downwind right hand for RW08 at an altitude of 3000ft. On initial contact with Luton the ATR43 crew reported that they had responded to a TCAS RA, but had now returned to their assigned level. Subsequent to the ATR43 pilot's report northbound traffic was observed after it had passed the ATR43 indicating an altitude of 2400ft. This ac was not in contact with Luton, he thought, and was believed to be operating outside CAS. The event as he saw it was described to the ATR43 crew on RT; it was explained that the base of the Class D CTA in that location is 2500ft and it was

accepted practice to allocate 3000ft as the lowest altitude within CAS despite the presence of unknown traffic operating potentially just below the 2500ft ALT base. The crew who did not indicate that an Airprox would be filed, acknowledged this description of events. Subsequently Essex RADAR advised that they had passed traffic information to the ATR43 crew on the unknown contact prior to transfer. He had no recollection of observing the PA31 before the ATR43 crew advised that they had responded to a TCAS RA and was not aware that the ATR43 had climbed to 3800ft ALT.

ATSI reports that the Airprox took place 12nm ESE of Luton Airport, close to the vertical boundary between the Class D Luton CTA and the Class G uncontrolled airspace of the London FIR. The ATR43 was positioning from Stansted to Luton under IFR and the PA31 was operating VFR en route from Redhill to Glasgow. Although the ATR43 pilot reported the TCAS Climb to Luton on RT afterwards, the Airprox was not received until some 17 days later. Consequently, by the time the LTCC Essex RADAR and Luton controllers were asked for reports, 3 weeks had elapsed. MATS Part 1, SI 3/01, considers it important that controllers complete the TCAS II Event - ATC Report Form if a pilot responds to an RA or reports the receipt of a TA, but there is no evidence that this was done. The ESSEX RADAR controller had absolutely no recollection of the flight at all.

The ATR43's flight from Stansted to Luton was co-ordinated between Essex RADAR and the Luton DIRECTOR. It was agreed the flight would enter the Luton CTA at 3000ft ALT, to position right-hand downwind for RW08 at Luton. The ATR43 crew departed Stansted from RW23 on a BUZAD 6R SID and were airborne at 1031. Communications were established with Essex RADAR at 1032:30, who identified the flight and instructed it to maintain 3000ft, whereupon the crew was instructed to turn L onto a heading of 265° at 1033:20. At 3000ft London QNH, the ATR43 crew was in the Class D Luton CTA where the base is 2500ft amsl. While the ATR43 was in the L turn westbound, the Essex RADAR controller noted unknown traffic, believed to be below CAS, on a converging track and passed traffic information at 1034:00, "[C/S] *there is traffic [the PA31] transiting outside controlled airspace on a...northwesterly [actually northeasterly] track at the moment he's to the south-west of you by eight miles indicating two thousand four hundred feet [ALT] unconfirmed*", the pilot responding "*...looking out...*". Some 15sec later at 1034:35, the controller updated the traffic information advising "*...that traffic [the PA31]...now has turned on to a northerly track he's in your half past ten at a range of about 4½ miles*", which the ATR43 pilot acknowledged.

At precisely the same time that the initial traffic information was being issued to the ATR43 crew by Essex RADAR, the pilot of the 'unknown' PA31 was passing his flight details to Luton DIRECTOR, reporting at 1034:10, 4nm N of BPK on a VFR flight from Redhill to Glasgow, at 2400ft, squawking A7000 and requesting a FIS. [The PA31 pilot had first called Luton at 1030:00, some 4min earlier but the controller was unable to take the flight details at that time, the controller advised that the flight should remain outside CAS and he would call the pilot back.] The details were acknowledged and the Luton DIRECTOR confirmed a FIS "*...outside controlled airspace QNH 1023 millibars*". As soon as the pilot's readback was completed the controller called the flight again at 1034:30 advising, "*...there is traffic in the airway just above you inbound to Luton it's an ATR43 and he's at 3000 feet converging from your right*". The pilot replied immediately "*roger visual and we're maintaining two thousand four hundred feet if you wish I can descend*". The pilot was told, "*At your discretion but you're outside of controlled airspace*". It's not clear if the latter part of this message was a question or a statement, however, the pilot responded with "*affirm*". The radar recording shows at 1034:39, that the ATR43 had rolled out on the heading of 265°, indicating 2700ft Mode C (1013mb) with the PA31 at 11 o'clock – 3.6nm indicating 2200ft Mode C (1013mb) – equating to about 2500ft London QNH (1023mb). At this point the Essex RADAR controller transferred the ATR43 to Luton DIRECTOR. About 40sec elapsed before the ATR43 crew called Luton DIRECTOR at 1035:20 – just as the PA31 was passing astern at minimum horizontal separation. The pilot reported receipt of the arrival information adding that "*...we've just had a TCAS climb and we're down just reverting back to 3000 feet*". DIRECTOR acknowledged the call and stated "*...that's on traffic outside of controlled airspace at twenty four hundred passing northbound underneath you QNH 1023 maintain altitude 3000 feet*". It transpires that during the 40sec transfer period the ATR43 crew had commenced a TCAS climb.

AIRPROX REPORT No 132/03

[UKAB Note: At 1035:04, the PA31 was in the ATR43 crew's 10:30 - 1.6nm as the latter passed 3100ft Mode C (1013mb) following the climb RA. The ATR43 ascended to a maximum of 3600ft Mode C, as it passed ahead of the PA31 out on the port beam at 0.44nm, the twin piston indicating 2100ft Mode C – equating to about 2400ft London QNH (1023mb). Minimum range of 0.24nm between the two ac occurred at 1035:22, just as the PA31 started to draw aft and pass astern as the ATR43 descended through 3400ft Mode C back to the assigned altitude, whilst the crew was first calling Luton DIRECTOR.]

Both controllers fulfilled their responsibilities and provided copious traffic information, whilst the ATR43 crew, operating inside CAS at 3000ft, responded to a TCAS RA in respect of the PA31, which was flying legitimately below the base of CAS at 2400ft QNH. The vertical separation between them varied from 500ft at 3.6nm apart to 1500ft when less than ½nm apart. Traffic flying within CAS is 'deemed' to be separated from unknown traffic flying in adjacent uncontrolled airspace. In this case the two controllers involved wisely alerted each pilot to the presence of the other by issuing traffic information. However in view of their acutely converging tracks and the ATR43 crew flying at the minimum advisable altitude some 500ft above the base of CAS, there was the possibility of the ATR43 crew receiving a TCAS RA as the other traffic was transponding with Mode C. With the current widespread fitting of TCAS equipment such events are likely where flights are operating close to the base of CAS and can cause unwelcome disruption to both ATC and the operation of the flight. In this case, the possibility of an alternative clearance for the ATR43 crew, especially at short notice, was probably not a practical option due to the co-ordination already agreed and the interaction with other traffic inside CAS. Nevertheless, with the widespread carriage of TCAS equipment, it is always prudent to consider and, if possible, avoid the likelihood of a TCAS 'encounter' in such circumstances.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board endorsed the extensive report provided by ATSI and it was evident that both the ESSEX RADAR & Luton controllers alike had provided comprehensive traffic information to both pilots about each other's ac. The PA31 pilot reports he was flying below the base of CAS at 2400ft QNH; although the radar recording based on 1013mb might have suggested his ac was at the base level of 2500ft a short period before the Airprox, this was apparently not the case. Traffic information provided by ESSEX RADAR to the ATR43 crew had clearly indicated 2400ft, as had also been the case in the transmissions to the PA31 pilot from DIRECTOR. The RT recording had made this plain and members were conscious of the tolerances applicable to indicated Mode C data (+/- 300ft). Thus the PA31 pilot was legitimately flying below the base altitude of the CTA on the correct pressure setting of the London QNH and had also spotted the airliner. Evidently the ATR43 had been assigned the minimum feasible altitude inside the CTA of 3000ft QNH, which should have provided 600ft of separation between these 2 ac. Even the 500ft separation indicated on Mode C should theoretically have been sufficient to forestall an RA as at these lower levels TCAS is aiming to afford about 300ft so members were at a loss to understand why a climb RA had been triggered in these circumstances. Some suggested that the descent from the momentary climb of 100ft in the turn, after the ATR43 had ballooned slightly to 2800ft (1013mb) at 1034:02, might have been the cause. But the RA was triggered after the ATR43 steadied westbound – in level cruise - just after it had been switched to DIRECTOR's frequency so members were unable to resolve this. As it was the ATR43 pilot complied promptly with the demanded RA and quickly climbed some 900ft to 3600ft (1013mb) - about 3900ft QNH. It was unclear from the pilot's report why TCAS had demanded such a large excursion above their assigned level, which fortunately had not induced a further problem with other traffic flying above the ATR43 in the CTA. Nevertheless, it was clear that the ATR43 had passed ahead of the PA31 - some 1500ft above it - just as the reporting pilot saw the latter and moments before the point of minimum horizontal separation at 0.24nm, as the PA31 was passing astern some 1300ft below the ATR43. Therefore, the Board concluded that no risk of a collision had

existed at all – unbeknown to the ATR43 crew at the time - and concluded this was a sighting report of traffic flying outside CAS in the FIR.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Sighting report.

Degree of Risk: C.

AIRPROX REPORT No 134/03

AIRPROX REPORT NO 134/03

Date/Time: 27 Aug 1244

Position: 5110N 0113W (14nm NNE SAM)

Airspace: AWY/CTA R41 (Class: A)

Reporter: SOLENT APR

First Ac Second Ac

Type: DHC8 ATR72

Operator: CAT CAT

Alt/FL: ↑FL70 FL75↓

Weather VMC CLOC VMC CLAC

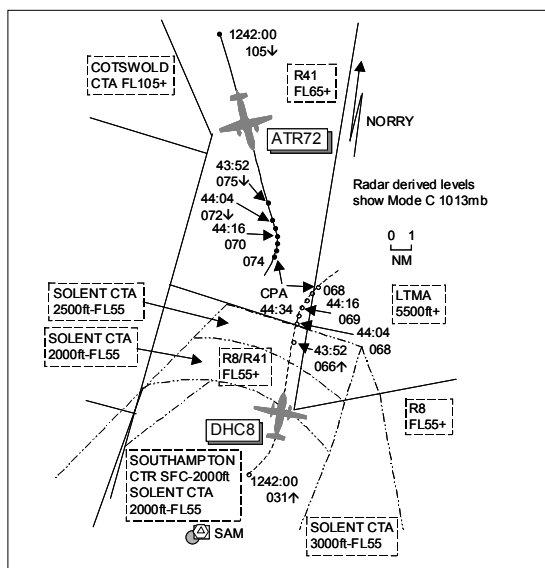
Visibility: NK 10km

Reported Separation:

300ft V 2nm H 500ft V 2nm H

Recorded Separation:

600ft V 2.6nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE SOLENT APR reports that the DHC8 was climbing out from Southampton on a NORRY departure and, once clear of conflicting traffic, was given climb to FL70 in accordance with the clearance given by TC SW. As the ac was climbing through FL64 he noticed the inbound subject ATR72 descending through FL78 which had not called on his frequency and which should have been subject to a standard release descending to FL80, as the Silent Handover Procedures were in force. He stopped off the DHC8 and gave it an avoiding action turn onto an easterly heading as well as passing TI. The subject ac passed about 600ft vertically and 3nm horizontally apart with neither crews reporting TCAS warnings.

THE LTCC OCK SC reports that she descended the ATR72 to FL70 in error, as the standing agreement was FL80. As she was transferring it to Solent Radar, she noticed the DHC8 at FL70, then STCA activated with a low severity alert. Immediately she gave avoiding action to the ATR crew whilst Solent also did the same with the DHC8.

THE DHC8 PILOT reports flying outbound from Southampton heading 350° at 200kt with clearance to climb to FL70 and in receipt of an ATS service from Solent RADAR on 120.22MHz. Climbing through FL67, the controller told him to maintain his present FL and to turn R onto heading 070° for avoiding action. Simultaneously, TCAS gave a TA alert on traffic, which he visually acquired and TI was received from the controller as the other ac passed 2nm down his LHS about 300ft above. He assessed the risk of collision as low.

THE ATR72 PILOT reports heading 200°, he thought, at 240kt inbound to Southampton squawking an assigned code with Mode C. Descending through FL75, he noticed a possible confliction (TCAS TA alert) and discussed possible avoiding action options with the FO. However, ATC gave avoiding vectors before any action was initiated by himself and he saw a high wing turboprop pass 2nm clear on his LHS about 500ft below. He assessed the risk of collision as low.

ATSI reports that at the time of the Airprox, the ATR72 was in communication with the LTCC OCK SC, whilst the DHC8 was under the control of the Solent APR. The OCK SC reported her workload as 'Medium to Medium/High' and the traffic loading was 'Medium'.

The OCK SC did state that there was a high level of verbal communication between the TC WILLO SC and herself in respect of climb co-ordinations. This is typical of the operation on these sectors, but there is nothing to suggest that on this occasion such a dialogue presented a significant distraction.

At 1239:50, the ATR72, which was en route from Cork to Southampton, contacted the OCK SC. The crew reported heading 105° and levelling at FL140. This was slightly unusual as the standing agreement is FL120, level 15 DME before CPT. Nevertheless, the ac had been correctly coordinated into the sector. The OCK SC issued a descent clearance to FL110 to the ATR72 crew, at 1240:00, which would ensure it remained within CAS, where the airway base in the area to the W of Greenham Common is FL105. The crew were instructed to turn R and vectored towards the centreline of airway R41, which was their route into Southampton. Further descent was given to FL70 (1241:20), when the ATR72 was 25nm N of the DHC8, and at 1243:50 the flight was told to route direct to Southampton.

At 1241, the DHC8, outbound from Southampton to Belfast City, established communications with the Solent APR. The crew reported that they were about to level at 2000ft, and the controller issued a clearance to climb to FL50. Approximately 1min later, the controller cleared the DHC8 to FL70, its cleared level to join airways, when it was 4nm NE of Southampton climbing through FL031 (3100ft QNH 1013mb) and instructed the crew to resume their own navigation to NORRY.

At 1243:50, when the ATR72 was passing FL75, the OCK SC instructed the crew to resume their own navigation for SAM and contact Solent Radar. The SC advised that she had checked both her strips and the radar before issuing this instruction. At that time, the DHC8 was in the 1 o'clock position of the ATR72, range 7.3nm and converging.

Coincidentally, the Solent Radar controller was about to transfer the DHC8 to London Control, but as he was transmitting the instruction he noticed that the ATR72, which he was expecting, had descended below FL80, which was the agreed level for such flights. The DHC8 crew acknowledged the frequency change instruction and then the controller transmitted, "*Disregard will you stop your climb stop your climb maintain your current level*".

The crew of the ATR72 acknowledged the OCK SC's instruction to change frequency, but then she transmitted "*ATR72 c/s actually disregard turn right avoiding action heading two two zero degrees*". Meanwhile, the Solent APR instructed the DHC8 "*DHC8 c/s avoiding action turn right heading zero seven zero*". The crew acknowledged this and the controller then passed TI as the ATR72 was passing FL72 in the 11 o'clock position of the DHC8, which was passing FL68. STCA had activated as the ac continued towards each other, but the avoiding action turns soon took effect. The ATR72 stopped its descent at FL70, at which time (1244:16) the DHC8 was in its 12 o'clock position range 3.8nm at FL69. The ATR72 commenced a gentle climb to FL74, and minimum separation occurred at 1244:34, with the ATR72 at FL74 and the DHC8 in its 9 o'clock position range 2.6nm maintaining FL68. Standard separation was restored soon afterwards. Neither controller used the 'new avoiding action phraseology' although the reaction by the crews was prompt and the instructions passed achieved the desired result.

The OCK SC had been dealing with a complex traffic situation, which included a northbound ac (another DHC8) climbing to FL100, a Citation outbound from Bournemouth climbing to FL80 and a PA31 maintaining FL90 and routeing from Birmingham to Jersey. She had instructed the ATR72 to turn R onto a heading of 165°, which would take it behind the other DHC8 ac, and to descend to FL70, planning to get below both the Citation and the PA31. The OCK SC explained that this plan was executed primarily by reference to the radar display and then supplemented by reference to the fpss. The Silent Handover Procedure (SHP), which was in force at the time of the Airprox, required the TC OCK SC to descend Southampton inbounds via CPT to FL80 and release them to their own navigation. She believed that in her desire to achieve separation against the Citation and the PA31, she temporarily overlooked the agreed level applicable to the ATR72.

AIRPROX REPORT No 134/03

The LTCC Coordinator would have passed Southampton the airways joining clearance for the DHC8. The OCK SC advised that this was invariably 'climbing to FL70, a frequency and a squawk'. No airborne time was written on the fps and the OCK SC could not recall being told that the DHC8 was airborne. Nevertheless, the strips for both the ATR72 and the DHC8 were available and had been placed under both the CPT and SAM designators. The SC reported that she arranged such fpps in level and then time order to identify conflicts.

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 complex traffic situation involving 3 other ac had been agreed by the Coordinator, who had accepted one of the ac, the Bournemouth outbound Citation, at FL80, the SHP agreed level. This then put the onus on the SC to implement the plan by separating the 3 ac and ensuring that the ATR72 complied with the SHP clearance, also FL80. It appears that the SC, in trying to resolve the various conflicts, had deemed it expeditious and safer to descend the ATR72 to FL70, beneath all the other ac but had forgotten the SHP (FL80) agreed level. As a result of this omission the ATR's descent to FL70 had gone uncoordinated with the Solent APR and this had caused the Airprox.

The SC noticed her error, during the ATR's transfer of communication transmission, and quickly gave an avoiding action R turn followed by TI to the crew of the ATR. Meanwhile the Solent APR had noticed the ATR descending through FL78 and immediately told the DHC8 crew a stop off at its present level and to turn R away to the E. These actions were followed by TI. The ATR crew had seen the potential conflict on TCAS but the ATC turn was issued and executed, during which the ac climbed to FL74 and the DHC8 was visually acquired. It passed 2nm clear on their LHS about 500ft below. Meanwhile the DHC8 crew received a TCAS TA alert simultaneously with the ATC stop-off and turn, which was executed and, following TI, the ATR was seen passing 2nm away to their L about 300ft above. All of these actions combined persuaded the Board that any risk of collision had been effectively removed.

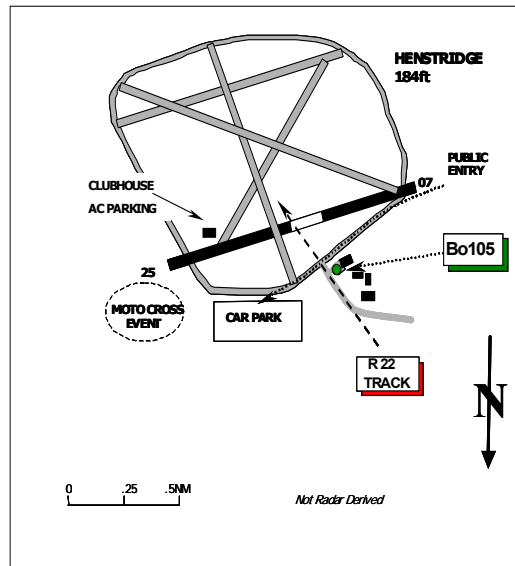
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The LTCC OCK SC descended the ATR72 below the agreed Silent Handover Procedure level without coordination.

Degree of Risk: C.

AIRPROX REPORT NO 135/03

Date/Time: 17 Aug 1110 (Sunday)
Position: 5059N 00221W(Henstridge Airfield 182ft)
Airspace: Henstridge Airfield(Class: G)
Reporting Ac Reported Ac
Type: Bo 105 R22
Operator: Civ Comm Civ Club
Alt/FL: 10ft 200ft
(N/K) (QFE 1008 mb)
Weather VMC CAVOK VMC CAVOK
Visibility: >10km >10km
Reported Separation:
100ft V 25m H 150m
Recorded Separation:
NR

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

THE BO105 PILOT reports that he was duty Air Ambulance pilot for the Dorset and Somerset Air Ambulance, bright yellow Bo105 from Henstridge. When he arrived at the airfield he was surprised to find a large number of caravans, trucks and other vehicles parked on the N side not far from his hangar (photograph provided) supporting a motocross event. Locally based gyrocopters, some 5 to 6 in number, were active on RW 07/25 and the taxiways, with fixed wing ac landing between the gyros. The N taxiway (passing very close to his location) was also being used by members of the public to gain access to the motocross event.

The ac was prepared and the crew briefed in accordance with the Company Orders and were declared online and available for tasking at 10:00 and 20 min later were dispatched to a road traffic accident. Departure from the field was difficult with cars and gyros on the taxiway, gyros on the duty RW, 07, and members of the public walking and cycling across the RW between the control tower and the motocross event. Due to the situation he was very aware of the need to exercise caution in any subsequent departures.

His 2nd call was at 12:08 and he manned the ac, called Henstridge local control and advised of his callout and that he would call before lifting. He was advised the duty RW was 07, that gyros were active on the RW and that there was a helicopter joining from the N (which expected to join the circuit on a left base leg). The inbound helicopter was advised of his start which he completed and carried out pre-take off checks, when a white van was driven past his ac to block off the taxiway 25m in front of him to prevent people from driving along the taxiway. As he called for taxi, the van driver, who he knew to be acquainted with his operations, left his vehicle and signalled him to hold, pointing above and behind. He lifted off slowly into a hover in order to check behind and saw the R22 at 100 ft agl passing 25m down his left side, so he held in the hover and passed a warning to the R22 pilot who did not join the circuit but flew through the centre of the downwind position over his helicopter, across a busy taxiway and then crossed the duty RW to his landing point. As he departed he advised the local A/G Operator of the incident. On his return he was advised that the R22 helicopter always joined that way and he was also informed that the A/G Operator was busy controlling other activities and perhaps could have been clearer about how the R22 was joining.

AIRPROX REPORT No 135/03

While he recognised that Henstridge is a non-licensed airfield there is still an expectation that pilots will abide by the Rules of the Air and join an airfield in a proper manner.

Since he did not see the R22 until it had passed him, he assessed the risk of collision as high.

THE R22 PILOT reports 3 months after the incident that he departed Bristol Lulsgate routeing to Henstridge and, as they passed Wincanton, he made a call to Henstridge Radio requesting the airfield information and was passed the Runway in use 07L QFE 1008 and wind light and variable. He acknowledged and requested a straight in approach to the landing site, to which Henstridge advised that a motocross event was taking place on the northern side of the airfield and that he should not over fly it and that gyros were active. They went on to advise him to fly to the W of the motocross event and he confirmed that he would. At 1nm to run he advised Henstridge of his position and confirmed his intent to fly W of the motocross event, to which Henstridge replied that in addition, the Air Ambulance would be departing shortly, and this he acknowledged.

As they approached, both pilot and crew first saw the Bo105 at $\frac{3}{4}$ nm and were looking to their right on the ground to see if the rotors were running but neither could tell until they were about 200m away. They continued inbound 150m to the left of Bo105 which was still on the ground and passed it at about 200ft on their descent, as they were parallel to it, it lifted and called to say he was lifting. He thought that it must have frightened the Bo105 crew to see another helicopter on their left side higher, and coming in to land. They continued and landed by the clubhouse as normal and saw the Bo105 depart at speed along 07 just above the ground, over flying people, gyros and vehicles. At no time did he over fly the Bo105 but kept well to his left.

He considered there was no risk of collision since he had continually watched the Bo105 until passing it.

UKAB Note(1): Henstridge is an unlicensed airfield with no ATZ. There is an Air/Ground Operator during the published hours of operation and 'all-day breakfasts' are served.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted solely of reports from the pilots of both ac.

The Board considered whether or not this incident actually was an Airprox or whether an MOR would have been more suitable; they decided however, since there had been similar precedents, that it was.

Since Henstridge is an unlicensed airfield with only an A/G radio service, the onus was solely on the pilots of the respective ac to achieve safe separation. Both ac were on the Henstridge frequency at the time and, had they communicated their intentions to each other, no doubt adequate separation could have been achieved. The reason that they did not and, in effect knowingly flew into conflict with one another, was of concern to the Board.

Expert helicopter members informed the Board that there was no obligation on Helicopters to join an airfield by means of the circuit, only an obligation to integrate safely with other ac. They also informed the Board that it is common to join as the R22 pilot did, indeed HEMS, Police and many other light helicopters routinely join in that manner. Further, since HEMS ac are afforded no priority over other ac movements, the normal rules of the air applied on this occasion. However, it should have been obvious to the R22 pilot that the air Ambulance was about to launch (on an emergency mission) and good airmanship would dictate that he should, not only have remained well clear of it, but also informed the Bo105 pilot that he was doing so. In addition this would have ensured his safe integration into the airfield traffic pattern. Members could not accept the R22 pilot's argument that he did not know the Bo105 was about to get airborne because he could not see if the rotors were turning. On balance however, the Board did agree that the Bo105 pilot had not been unwise to raise his ac into a low hover and turn to

see the R22, again, had he made his intentions clear to the R22 pilot, the incident would probably have been prevented.

It was unclear to the Board whether the person in the 'White Van' was dispatched by the Aerodrome Authorities to block the taxiway, or whether he was a passer by. In any case, they commended his actions by reducing the risk, not only to the Bo105, but also to passers by.

While the Board recognised that many small airfields need to generate income from activities outside mainstream aviation to ensure their continued operation; such activities however, must be integrated safely with the operation of ac, which in an uncontrolled environment widens the scope for things to go wrong. It would seem that in this case, the activities were not safely integrated in that pedestrian and vehicular access to the ac operating areas was not restricted and the A/G operator was distracted from his primary duties. However, ultimate responsibility for the safe operation of ac lies with the captain and if the Bo105 pilot was not satisfied that he could operate safely from Henstridge on that day, he should have considered alternative arrangements.

Unlike the Bo105 pilot the R22 pilot had seen the other ac in sufficient time to take, what he considered to be, safe separation. At the point where the R22 passed the Bo105, the latter ac was stationary in a low hover and the Board therefore concluded that there had not been a risk of the ac colliding.

PART C: ASSESSMENT OF CAUSE AND RISK

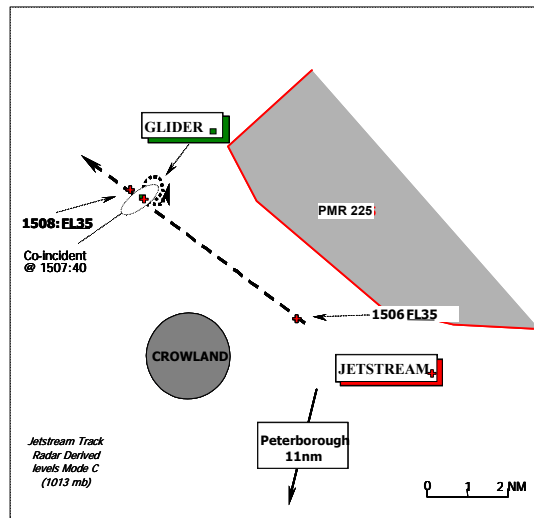
Cause: The R22 pilot flew close enough to the Bo105 to cause concern.

Degree of Risk: C.

AIRPROX REPORT No 136/03

AIRPROX REPORT NO 136/03

Date/Time: 29 Aug 1515
Position: 5247N 00011W(18nm SE Cranwell)
Airspace: London FIR (Class: G)
Reporting Ac Reported Ac
Type: Jetstream Grob Glider
Operator: HQ PTC Untraced
Alt/FL: FL35 N/K
Weather VMC Below Cloud N/K
Visibility: 10km + N/K
Reported Separation:
0.25nm H 100ft V N/R
Recorded Separation:
Contacts Merge



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE JETSTREAM PILOT reports flying a red and white Jetstream ac on a training sortie from RAF Marham to RAF Cranwell with HISLs selected on in receipt of a RIS from Cranwell. While heading 300° at FL35 and 180kt, ATC reported a contact: '12 o'clock at 5nm, possibly clutter' and subsequently reported at 3nm as intermittent. A glider was then spotted at approx 0.5nm and 100ft below at which point the ac was turned hard left and climbed to avoid impact. The glider appeared unaware of the Jetstream's proximity and continued on its original track. The Jetstream pilot reported to ATC that 'the previously reported ac was a glider, which I missed by 100ft'. The ac was recovered to RAF Cranwell without further incident. The pilot considered that there was a possible risk of collision.

THE GLIDER PILOT was not traced.

STATION COMMENTS This is another report that emphasizes the importance of good lookout and the usefulness of a RIS in the busy Lincolnshire airspace. The controller quite correctly called the conflict at 5 and 3nm, alerting the pilot to the potential hazard and enabling him, eventually, to see the glider. The crucial lesson for all pilots is that, although the ATC calls under a RIS are for information only, if you cannot see the called traffic, it is prudent to alter heading and if necessary request a heading from ATC who can be best placed to provide safe separation. Equally important, this incident provides a timely reminder that a "slow moving contact, possibly clutter", has every possibility of being a genuine contact and therefore a serious hazard.

AIS Mil reports that despite extensive inquiries they were not able to trace the glider pilot. All their inquiries led to a Club based 5nm from the incident but none of the 5 pilots airborne locally at the time saw a Jetstream and all declined to make a report.

MIL ATC OPS reports that the Jetstream pilot called Cranwell APP at 1505:34 for recovery. The ac was identified and placed under a RIS "...limited due to poor radar performance". At 1506:08 APP passed TI on a contact "...12 o'clock 5 miles very slow moving manoeuvring may be clutter", which was acknowledged by the Jetstream crew. TI was then updated 49 sec later "..... previously reported traffic 12 o'clock 3 miles intermittent contact" and the crew again advised that they were looking. At 1508:00 the Jetstream crew advised APP of "...traffic crossed the nose left to right 100 foot glider below" but they did not report an Airprox.

The Debden Radar recording does not show any conflicting traffic at the time or position the TI was passed by APP. At 1507:40 a contact appears in the Jetstream's left 11.30 at 1.45nm, this fades from radar briefly and reappears 6sec later on the same bearing at 0.5nm. The contacts merge at 1507:52.

When in receipt of a RIS pilots are wholly responsible for maintaining separation from other ac, whether or not controllers pass TI. APP correctly limited the service due to poor radar performance; the Short Time Constant has a problem that is awaiting a manufacturer's solution. Although painting intermittently on Cranwell's radar but not at all on the Debden, APP appears to have passed accurate information on the traffic he saw, to the Jetstream pilot. It is considered therefore, that he fulfilled his obligations when providing a RIS.

HQ PTC comments that controllers always face a dilemma when ac under their control come close to indeterminate, and often spurious, primary contacts. There is a spectrum of recreational aerial contrivances available these days, most of which paint inconsistently on radar. Nevertheless, the controller did everything required of him by the rules - and more - whilst operating a radar with degraded performance. This Airprox might have been avoided if the Jetstream pilot had eased away to the right but at least he had been directed to look in the right direction.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board noted that Cranwell APP passed accurate and effective TI to the Jetstream pilot, enabling him, albeit at a late stage, to acquire the glider visually. Having seen it he was then able to manoeuvre his ac and generate a miss-distance of ¼ nm and 100ft and, since he correctly opted to go behind the glider, Members were not surprised that its pilot did not see or hear the Jetstream.

Since the Jetstream pilot maintained visual contact with the glider throughout his evasive manoeuvre, the Board concluded that there had not been any risk of the ac colliding.

Specialists on the Board disagreed with the Station advice to 'request a heading from ATC' since they were often not in a position to provide effective separation at short notice while conducting a RIS.

There was discussion about the advisability of using the phrase 'may be clutter' and opinion was evenly divided even among specialist Members. The same was the case about taking precautionary lateral or vertical avoiding action against an intermittent unpredictable or manoeuvring contact as it could quite possibly change direction and unexpectedly reappear in the 12 o'clock; again opinion was divided as to the advisability of such a course of action.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A conflict with an untraced glider in Class G airspace resolved by the Jetstream pilot.

Degree of Risk: C.

AIRPROX REPORT No 137/03

AIRPROX REPORT NO 137/03

Date/Time: 2 Sep 1217

Position: 5225N 0051W (18nm NE DTY)

Airspace: AWY T420/B4 (Class: A)

Reporter: LACC S28/34T

First Ac Second Ac

Type: B777 DO328

Operator: CAT CAT

Alt/FL: FL190↑ FL190

(N/K)

Weather VMC NK VMC CLAC

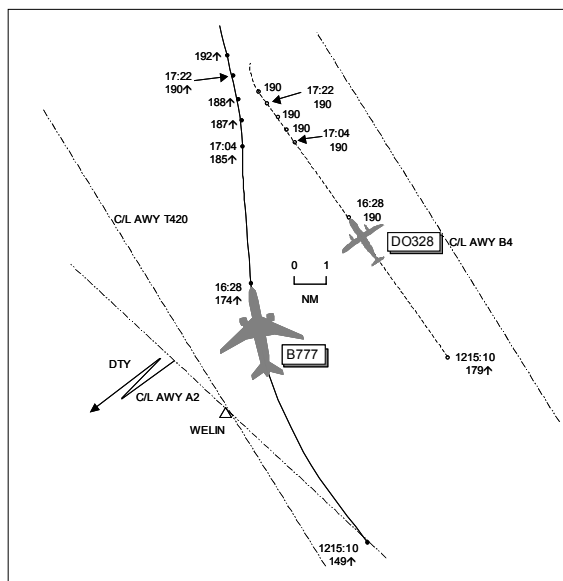
Visibility: >10km >50nm

Reported Separation:

NR nil V 1.5nm H

Recorded Separation:

nil V 1.4nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE LACC S28/34 TACTICAL CONTROLLER reports that prior to the Airprox, an ac (A/C1) called on frequency on a radar heading which would take it underneath a Manchester inbound so he issued its crew a turn onto heading 350°. He thought the crew read back 250° so he tried to ensure that the pilot had acknowledged the correct heading. During this period, the subject B777 pilot called on frequency on heading 330° and he issued climb clearance to FL280; A/C1's crew then confirmed the correct assigned heading. His attention was next drawn to the climbing B777 that was tracking towards the DO328 which was level at FL190. He gave the B777 pilot an avoiding action L turn onto heading 280° and later gave him descent to FL180 as the ac was slow to start turning. The DO328 pilot then called on frequency and was given an avoiding action R turn onto 360°.

THE LACC S28/34 PLANNER CONTROLLER reports that her attention was drawn to the conflict by STCA when the B777 was climbing through FL182 whilst converging with the DO328 at FL190. The Tactical controller had been concerned with A/C1's readback so she drew his attention to the conflict. She believed that the B777 crew had only just called and, as the Dornier was not yet on frequency, she telephoned LTCC MID to tell them to turn the DO328 R. However, just as she started doing this the Dornier pilot called, so the Tactical controller gave both subject ac avoiding action turns and the B777 was given descent to FL180.

THE B777 PILOT reports on departure from Heathrow RW27R to the USA, having been cleared to fly a WOB2F SID and in receipt of an ATS from London on 127.1MHz. Shortly after take-off, his flight was taken off the published procedure and was being given various headings and altitudes when the incident occurred. It appears that ATC told them to "continue heading" which the crew misunderstood as "turn to heading 360°"; this turn put his ac into conflict with a DO328. There was never any question in the cockpit as to the 360° heading. The heading was changed by the FO and acknowledged by the Capt, the PF, and the turn was commenced. Climbing at 310kt, ATC gave them a turn away from the other ac which was visually acquired, briefly, behind and to their R as TCAS gave a TA alert. The Capt opined that since flying in European airspace, there have been numerous occasions when his crew has had to question instructions owing to their inability to understand the controller. He felt that heavy accents of British and Irish controllers combined with different terminology used from that in the USA (base country) and the quality of radio transmitters used made communications more difficult. Also, being taken off

SIDs and being given numerous small heading changes (5-15°) and step climbs, increased cockpit workload at a time when overall workload was already extremely high.

THE DO328 PILOT reports flying en route from London to Dundee level at FL190 heading 330° at 300kt and in receipt of an ATS from London on 127.1MHz. At the time, the RT frequency was congested and the controller's workload appeared to have been high. He had been unable to check-in on the frequency but heard a pilot (A/C1) omit a heading readback and the subsequent call to the pilot was taken in error by the pilot of another ac. An ac, possibly a B767 or similar type, was seen visually at about 5nm range converging from his L in a shallow climb, TCAS gave a TA alert when separation reduced to 2.5nm. The controller's instruction to descend to FL180, which was possibly addressed to his ac, was 'stepped on' by another ac. ATC then turned the conflicting ac L followed by a R turn on heading 360° to his ac to de-conflict the situation. The Boeing pilot was heard to call visual with his ac as he watched it cross about 1.5nm ahead climbing through his level. He assessed the risk of collision as nil although wake turbulence could have been a problem.

ATSI reports that the B777 was handed over to the S28/34 Tactical controller on a radar heading of 330°, climbing to FL190, the agreed level. This had been applied by the LTCC controller who was working the DO328 from London City to Dundee, on a heading of 335° also climbing to FL190. The slightly divergent headings would ensure that lateral separation would be maintained. After the B777 called at 1215:10, the Sector 28/34 Tactical controller responded with the following *"B777 c/s London roger continue on that heading climb flight level two eight zero"*. The pilot read back *"Three six zero on the heading and two eight zero on the altitude B777 c/s"*. This inaccurate readback was not challenged by the controller and resulted in the B777 turning towards the DO328 rather than tracking virtually parallel to it. The investigation determined that, at the same time as the pilot of the B777 was making the initial call, STCA activated between two ac not involved in the Airprox. This situation occupied the controller's attention, and was complicated further because one of these two ac was not on his frequency.

During the following 90sec, the controller focused attention on the situation between the two ac highlighted by STCA. In addition, three other ac made their initial calls on the frequency at that time. The DO328 had also been transferred to the Tactical controller but the frequency was too busy for the crew to make their initial call.

At 1216:31, STCA triggered between the B777 and the DO328 and, at 1216:50, the Planner repositioned the TDBs of the two ac presumably to make them both clearly readable, whilst alerting the Tactical controller to the conflict. The Tactical controller, who had seen the conflict independently, started to take corrective action and, at 1217:00, he transmitted *"B777 c/s avoiding action turn left heading two eight zero degrees"*. At this time, the DO328 was maintaining FL190 in the 3 o'clock position of the B777 at a range of 1.7nm with the B777 passing FL185 climbing. Meanwhile, the crew of the DO328, having managed to get in on the frequency, were then passed an avoiding action instruction to turn R onto 360°. The controller then instructed the B777 to descend to FL180. Minimum separation occurred at 1217:22, when the B777 crossed, from L to R through the 12 o'clock position of the DO328 at a range of 1.4nm when both ac were at FL190.

Following the Airprox the relevant RT recordings were checked. It was found that, depending on which of the five RT recording sources it was taken from, the clarity varied. However, on all recordings it is evident that the pilot of the B777 stated the inappropriate figures *"Three Six Zero"* at the start of her acknowledgement to the heading and climb instruction issued by the S28/34 Tactical controller. The controller described his workload as moderate to busy, however, virtually all the traffic was operating within S28 airspace and so it is assessed that a split would not have reduced this workload appreciably.

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 the B777 crew were sure that they had heard the S28/34T instruct them to turn onto heading 360°, the RT recording revealed this not to be the case. After the Boeing FO had called on frequency and reported on heading 330° the controller had told them to “...continue on that heading...”. ATCO members thought that although the phrase used by the Tactical controller was unambiguous, the use of standard phraseology “continue present heading” or “continue heading 330°” might have helped in this case. No mention of the number 360 could be found on any frequency that the B777 was on at the time. Pilot members opined that the B777 crew may have been listening out on another frequency and may have heard the number 360 from that source - it was usual for westbound transatlantic ac to be calling Shanwick for Oceanic clearances during their climb to cruising level at that stage in their flight. UK airline CRM standard operating procedures normally involve both crewmembers listening out on the ‘active’ RT frequency, with the PNF acknowledging the transmission, the PF agreeing with the PNF’s read back before carrying out the instruction. However, in this case, for whatever reason, the B777 FO read back the wrong heading instruction and this went undetected by the ac Capt and also by the S28/34 Tactical controller. This had caused the Airprox.

Members commended the good teamwork exhibited by the S28/34 ATCOs when the confliction was noticed on the Sector. The Tactical controller gave an avoiding action L turn to the B777 crew and then a R turn to the DO328 crew but as the B777 was slow commencing the turn, the controller told the Boeing crew to descend to FL180. The B777 crew briefly saw the Dornier ac to their R and TCAS gave a TA alert. Meanwhile, the DO328 crew had noticed the potential conflict early, seeing the B777 5nm to their L, converging, still below them but in a shallow climb. Following a TA alert, the crew were given an avoiding action R turn and, whilst commencing the turn, they watched the B777 as it cross 1.5nm ahead climbing through their level before pulling away. The geometry of the encounter had shown the B777 quickly overhauling the DO328 and passing abeam it without undue concern from the latter’s crew. This element combined with the sighting/actions of the DO328 crew was enough to persuade the Board that safety had remained assured during the encounter.

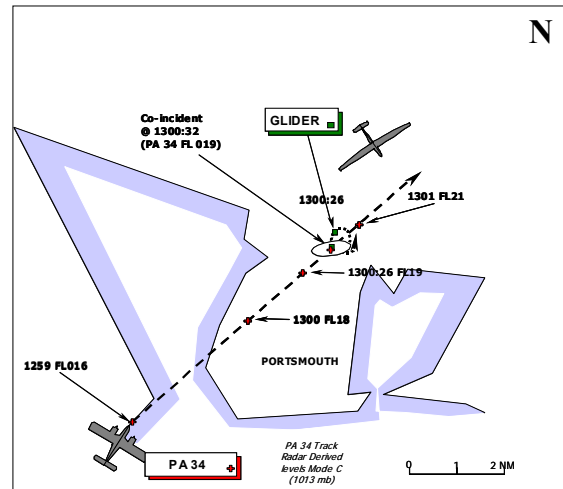
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The B777 FO read back the wrong heading instruction that went undetected by the ac Capt and the LACC S28/34 Tactical controller.

Degree of Risk: C.

AIRPROX REPORT NO 138/03

Date/Time: 31 Aug 1300 (Sunday)
Position: 5050N 0105W (Portsmouth)
Airspace: London FIR (Class: G)
Reporting Ac Reported Ac
Type: SHK1 Glider PA34
Operator: Civ Pte Civ Pte
Alt/FL: 2200ft 2000ft
Weather VMC Below Cloud VMC
Visibility: 60km >10km
Reported Separation:
 'Close' Not seen.
Recorded Separation:
 Contacts Merge

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

THE GLIDER PILOT reports flying a white SHK1 glider with red wing tips, solo on a local sortie from Bembridge IoW. While overhead Gosport [UKAB Note (1): The position recorded on the radar is over the N edge of Portsmouth as shown on the diagram] at about 2200ft and heading 120° at 55kt in communication with Lee on Solent glider base, he had a very brief glimpse of another ac and considered that a collision was imminent so he made an instinctive steep climbing turn to the left, without time for thought. As the glider's nose was raised he lost sight of the other ac but he thought the pilot would have had a full plan view of the glider as it climbed. In the very brief time that he had him in sight he saw no sign of evasive action by the other ac. He was very shocked and landed at the nearest airfield which was Lee on Solent.

He believed that both pilots had been keeping a very poor lookout to let such a situation occur in very good visibility.

He only had the other ac in view for 3-4sec and this, together with the shock made his recollection of bearings and headings less than reliable.

THE PA34 PILOT reports en route from St Mawgan to Blackbushe and had routed via Isle of Wight at the request of his passenger for sight seeing. He was heading about 020° at 160kt, squawking 7000 with Mode C and his red and white ac had strobes and pulse lights switched on. He was aware that considerable gliding activity was taking place in the area due to the excellent conditions and the proximity to Lasham and other busy sites. He therefore requested the passenger to assist him with his lookout. He had no ATC service at the time but was preparing to ask for a RIS from Farnborough after coasting in. He reported that he does not normally operate the ac at such low altitudes, but the distance between the Isle of Wight and Blackbushe was so short that he saw little advantage of climbing higher than 2000ft for that leg. He visually acquired a number of ac but was not aware of the reporting glider.

UKAB Note (2): The Pease Pottage radar recording shows the PA 34 tracking NNE over Portsmouth in a gentle climb from FL016. At about 1300:26 a primary return believed to be the subject glider pops up in a left hand orbit in the PA 34's (now indicating FL019) 1130 position just inside ½ nm head on, and turning towards it. At that aspect it would have presented a very small visual target, coloured white with some Cu cloud in the background, for the PA34 pilot to acquire even in very good visibility conditions. At this time the ac are closing at about 210kt i.e. it took est 8.5sec to travel ½ nm. From the glider pilot's cockpit the PA34 would have initially been head on before disappearing out of view below his nose as

AIRPROX REPORT No 138/03

he took avoiding action. Since the sighting of the PA34 on a collision course was at the last moment, it cannot be determined whether the avoiding action taken by the glider pilot actually affected his flight path or whether the ac would have missed each other in any case.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board considered that during the summer months, particularly when the conditions were good for gliding, it is prudent for ac with a reasonably fast cruising speed to fly well below the base of the cloud, since gliders can congregate in that area (between 1500ft agl and the base of the cloud). Further, some Twin ac, particularly the PA34 do not have good visibility from the cockpit, especially over the engines, and the panel is quite high. In these circumstances it can be safer to cruise a little lower as it is both easier to see traffic against the sky and there is less chance of a collision.

GA expert Members also informed the Board that frequently there was little learning curve in the GA community as turnover of active personnel was very high and consequently experience levels were low. Further, although both were most desirable, TCAS was prohibitively expensive for most light ac operators and a lightweight transponder for gliders and other very lightweight ac had not yet come on the market.

It is very well known that gliders are very difficult to see, particularly in a head or tail-on aspect; the only certain way to avoid them is not to fly where they are. Glider pilots too, should be aware that their ac are very hard for other airspace users to see and are more than ever obliged to maintain a very good lookout.

In this case the majority of Board members believed that the, albeit very late, action by the glider pilot had been just sufficient to ensure that there had not been an actual risk of the ac colliding.

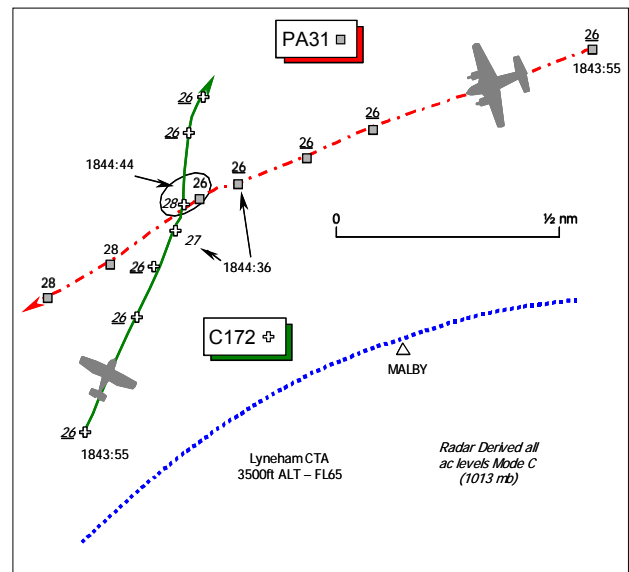
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A non-sighting by the PA 34 pilot and a very late sighting by the SHK1 pilot.

Degree of Risk: B.

AIRPROX REPORT NO 139/03

Date/Time: 2 Sep 1844
Position: 5136N 0206W (7nm NNW of Lyneham elev - 513ft)
Airspace: London FIR (Class: G)
Reporting Ac Reported Ac
Type: Cessna C172 Piper PA31-350T
Operator: Civ Club Civ Comm
Alt/FL: 2700ft FL40
RPS (1011mb) SPS
Weather VMC CLOC VMC CLBC
Visibility: 30km >10km
Reported Separation:
10-15m H/20ft V NR
Recorded Separation:
Contacts merged

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

THE CESSNA C172 PILOT reports, over 5 weeks after the occurrence, that his aeroplane has a white colour scheme and the red anti-collision beacon, wing tip HISLs and navigation lights were all on, whilst inbound to Kemble for an overhead Cct join. He was not in receipt of an ATS after leaving Lyneham's frequency about 1½ min before the Airprox occurred, squawking A7000 with Mode C, but he was listening out on both the Kemble and Bristol frequencies. About 4nm S of Kemble, heading 020° at 110kt, he was descending from 3000ft RPS (1011mb), he thought, and had just completed an external lookout scan from L – R, whereupon he raised the right wing slightly to expose the airspace at 2-4 o'clock slightly above his high-wing monoplane. This revealed a low-wing twin [the PA31] flying straight and level towards him about 200m away at the same altitude. To avoid the other ac, he pushed the nose down and banked 50° to the L, whilst adding L rudder to increase his descent, as the PA31 passed 10-15m away to starboard and crossed obliquely astern from R – L about 20ft above his aeroplane with a "very high" risk of a collision. He opined that his ac's high-wing had obscured the other ac during his normal scan, adding that the only thing that "saved" him was a disciplined lookout and he "...now believes in TCAS for light ac".

THE PIPER PA31-350T CHIEFTAIN PILOT reports some 5 weeks after the event that his aeroplane has a white colour scheme with red & blue stripes; the HISL was on. He was inbound from Oxford (Kidlington) to Bristol International, under an ATS [he could not recall whether it was a RIS or FIS] from Brize RADAR at about FL40 he thought; on first contact the controller passed traffic information about an ac flying in the opposite direction 7-8nm away. Later he was informed of traffic for a second time at a range of 1nm. South of Kemble, heading 240° at 160kt he first sighted the conflicting ac in level flight at the 1130 position - 400-500m away, closing from L- R and slightly below his ac – he quoted 100-150ft maximum. To avoid the other ac – a white high-wing Cessna - he promptly initiated a climb but then lost sight of the Cessna as it passed below his ac, so he could not determine the minimum separation when their flight paths crossed. He did not assess the risk but opined that without his avoiding action climb the Cessna would have passed about 100-150ft below with little or no horizontal separation. He cited the twilight conditions and high cloud cover as relevant factors, stating that the Cessna had appeared from a dark background.

MIL ATC OPS reports that the C172 pilot was instructed by Lyneham to free-call Kemble when abeam Hullavington some 2min before the Airprox occurred. The C172 pilot had been under a FIS and the

AIRPROX REPORT No 139/03

controller does not remember there being any other traffic to affect the flight when released to Kemble. The PA31 pilot had worked Brize RADAR, although the controller has no recollection of controlling it. The FPS reveals that the PA31 pilot had been in receipt of a FIS and was logged 'off frequency' at 1844. Unfortunately, the Brize RADAR RT tapes had been reused before their involvement was discovered some time after the event.

The Cleve Hill Radar recording shows the C172 changing squawk to A7000 at 1841:27; there was no traffic to affect this flight at that time. The PA31 is shown tracking SW, passing N abeam the Lyneham CTA squawking A3701, which was changed to A7000 at 1845:10, after the Airprox had occurred. Although it is evident that the PA31 pilot was in receipt of an ATS from Brize RADAR at the time of the Airprox, to the controller, this was nothing more than a routine unremarkable flight. Whether the PA31 pilot was receiving a RIS or FIS appears to be irrelevant as, according to the pilot's report, Brize RADAR did pass traffic information that enabled him to sight the other ac, although there is no transcript to support this.

UKAB Note: Analysis of the data provided by the Cleve Hill Radar recording is rather inconclusive. The C172 is shown tracking 020° maintaining a constant 2600ft Mode C (1013mb) as the PA31 approached to close quarters from the NE consistently indicating the same level. At 1844:36, on the sweep before the contacts merge, the C172 is shown 100ft above the PA31 contrary to both pilots' reports. This perplexing geometry is further compounded on the next sweep at the CPA where the C172 is shown 200ft above the Piper and contrary to the reported avoiding action descent initiated by the C172 pilot on sighting the PA31, whose pilot reported an avoiding action climb that is clearly shown after the tracks cross. However, this anomaly could be explained by the inherent tolerances applicable to Mode C indications and the extremely large scale of the recording in this instance but does not permit exact determination of the minimum separation with confidence. Nevertheless, this was evidently an extremely close encounter. The PA31 pilot changed the SSR code at 1845:47, 1min after the occurrence.

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 authority.

It was unfortunate that the exact details of this occurrence had taken so long to come to light; although the reporting pilot had notified his intention to report the Airprox, requisite details were not available until 5 weeks later. This had impeded the investigation of this occurrence as ATC recordings are only retained for a maximum of 30 days unless impounded beforehand, thus there was no recorded RT information available in this instance to the Board, who implored pilots to file completed reports as soon as possible after the event. Nevertheless, there was no reason to doubt the veracity of the PA31 pilot's report; his ac had been identified some two weeks after the Airprox had occurred. He said he had been advised of the presence of the other ac by Brize RADAR during two transmissions of traffic information about the conflicting ac, firstly at 7-8nm, then at a range of 1nm and probably just before the PA31 pilot switched frequencies to Bristol. Therefore, on his part, this was a matter of 'see & avoid', though he reports that the Cessna was not spotted until it had closed to 4-500m away but fortunately slightly below his ac. In the gathering twilight, with all the C172's lights reported to be on, by all accounts this was a very late spot indeed and in the Board's view, one part of the cause. For his part the C172 pilot had dispensed with any assistance from ATC before this Airprox had occurred and was merely listening out on two frequencies that had provided no advantage. If he had heard the PA31 pilot call on the Bristol frequency it had clearly not provided a clue to the twin approaching rapidly from the NE to which, in this situation, he was required to give way under the 'Rules of the Air'. The Cessna pilot was commended for electing to clear his starboard wing blind spot above him when he did. This enabled him to glimpse belatedly the PA31 slightly above his ac a mere 10-15m away and allowed him to dive out of its way. Again, visual acquisition by the Cessna pilot of the PA31 had been very late and formed the other part

of the cause. It was acknowledged, however, that approaching each other at co-altitude had presented each pilot with a smaller 'target' to see than would have been the case with some vertical separation.

Although the radar recording was fortunately still available and had contributed appreciably to the understanding of what had occurred during this very close quarters incident, it had not replicated the pilots' reports accurately. Here the radar recording had incorrectly suggested that the C172 had climbed over the PA31, whereas both pilots' accounts had agreed that the C172 had passed beneath the PA31. Such inconsistencies with Mode C (the tolerances for verified Mode C are +/- 200ft) were not unknown at close quarters, thus the Board accepted that both pilots had taken intuitive avoiding action and theirs was a true reflection of events. However, the C172 pilot's reported sighting distance was probably an under estimate; it is generally accepted that it takes at least 2 sec for a pilot to see and then change his ac's flight path and his reported dive coupled with a sighting range of 10-15m at these speeds did not jibe. Conversely, the PA31 pilot's estimate may have been slightly over optimistic. The radar recording did not reflect his ac's climb when he said he sighted the other ac, as it was still in level cruise 400-500m away - the climb was not shown until after the respective acs' tracks had crossed. Nevertheless, in the Board's view, this did not alter the seriousness of the encounter as the contacts had merged in azimuth with no indicated vertical separation from Mode C whatsoever just moments before the event. However, both pilots had managed to alter their acs' flight paths just in time to avert a collision, leading the members to agree unanimously that the safety of these ac had not been assured by any means.

PART C: ASSESSMENT OF CAUSE AND RISK

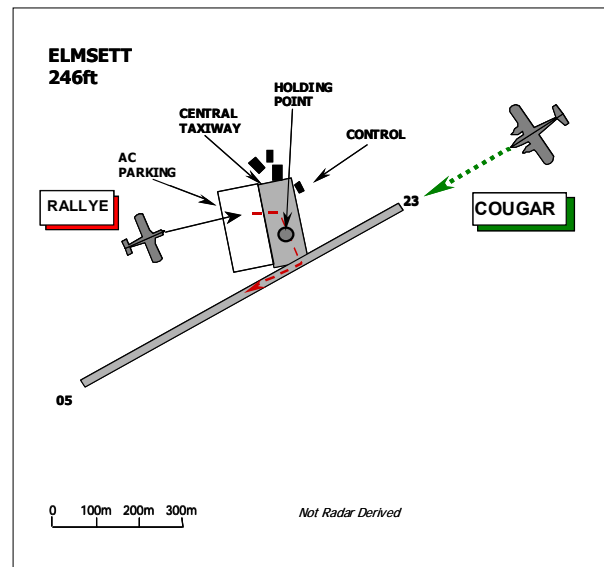
Cause: Very late sightings by both the C172 pilot and the PA31 pilot.

Degree of Risk: B.

AIRPROX REPORT No 141/03

AIRPROX REPORT NO 141/03

Date/Time: 31 Aug 1230 (Sunday)
Position: 5205N 00059E (Elmsett Airfield)
Airspace: Elmsett ATZ (Class: G)
Reporting Ac Reported Ac
Type: Rallye GA7 Cougar
Operator: Civ Pte Civ Pte
Alt/FL: 10ft 200ft
(QFE) (N/K)
Weather VMC CAVOK VMC CAVOK
Visibility: >10km >10km
Reported Separation:
150ft H 40ft V N/R
Recorded Separation:
Not recorded on Radar
Estimated 50ft V from Video.



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE RALLYE PILOT reports flying in a white and maroon ac, which was not SSR equipped but the beacon was selected on. He had landed at Elmsett from Wattisham to refuel and was preparing to return to Wattisham on a Sunday when no ATC service was available at Elmsett [See UKAB Note(1)] but in very good weather and visibility conditions. Since Elmsett is within the Wattisham MATZ and their ATZs overlap, the published procedures, he thought, required notice of arrival/departure to be transmitted on Wattisham App (125.8) when no ATC service was available at Elmsett. He transmitted his intention to taxi to the RW and then, after looking in both directions, his intention to enter the RW for departure. He thought that either the other pilot was not listening on 125.8 or did not hear his transmissions. Shortly after lift off at about 50ft agl he saw another ac overtake him 150ft on his left and 40ft above him banking to the left. He did not take any avoiding action as he saw that the other ac was banking away from him and he assessed the risk of collision as low since the other pilot had seen him throughout.

THE GA7 COUGAR PILOT reports flying a red, black and white ac with strobes selected on and squawking 7000 with Mode C, from Stapleford to Elmsett. He was listening out on the Elmsett frequency of 130.9 since Wattisham App was closed, and made a blind call transmitting his intentions on that frequency. While at 100kt and 200ft on the final approach to RW23, a single engine ac taxied from the concrete apron and without stopping at the holding point to look to see if any other ac were approaching, entered the RW in front of him and commenced a take off roll also without stopping. He retracted his landing gear, applied full power and executed a go around. He assessed that the risk of collision was low.

A REPRESENTATIVE OF THE AIRFIELD MANAGEMENT reports that at 1329hr local time on 31/08/03 a Rallye ac was seen on the airfield CCTV recording system, to taxi from the refuelling station and enter RW23 without stopping, forcing an ac on final approach to go around. The approaching ac was seen on the CCTV recording to pass over the touchdown area within 5sec of the time at which the Rallye entered the RW and is estimated to have been at 200m on the final approach at the time the Rallye entered the RW. As the overshooting ac closes, it is estimated they come within 50ft vertically of one another.

UKAB Note (1): Since this incident the management structure at Elmsett has changed and an Airfield Manager post has been established.

UKAB Note (2): In the UKAIP, Elmsett is published as being open from 0800-1600 daily in the Summer. All movements are PPR by telephone. In addition an A/G service is published as being available in the Summer 0800-1600 daily.

UKAB Note (3): The UKAIP states at Elmsett 2.17.6 - ATS Airspace

‘Remarks

Elmsett ATZ is situated within the Wattisham MATZ. Establish initial RTF contact on approach with Wattisham on 125.8’

Ac intending to arrive at or depart from Elmsett aerodrome must be able to communicate with Wattisham ATC and Elmsett Radio. Ac without two way RTF may be permitted to operate with PPR. Pilots are reminded that Wattisham ATZ is permanently active.’

UKAB Note (4): The UKAIP states at Elmsett 2.20 –Local Traffic Regulations: Warnings

‘(b) Taxiing beyond holding point Alpha is only permitted when ac are not taking off or landing.’

UKAB Note (5): Despite the above AIP entry it is understood that Elmsett A/G does not operate at the weekend and that pilots are notified of this when PPR is given. At the time of this incident no A/G service was available and from their reports it would seem that the pilots of both ac involved were aware of this. Further, although when Wattisham ATC is closed the Approach frequency of 125.8 is monitored by the SAR Flight Ops in order to ensure deconfliction of their ac from other Helicopter and Glider activity, no service is offered by them. Comprehensive arrival/departure procedures for operations from Wattisham outside the hours when ATC is published as being open, are contained at P160 Rmks 8 of the RAF Flight Information Handbook. They are not however, mirrored for Elmsett in the UKAIP entry which does not reflect the current situation and is unclear.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac and a report from the airfield operators.

Although there were many secondary factors, this was in essence a very straightforward occurrence caused primarily by the Rallye pilot entering an active runway without checking that it was safe to do so. Specialist members considered that he made many mistakes in the lead-up to the incident. The video recording shows that he did not stop at the holding point and apparently did not conduct full pre-take off checks. Further, he did not transmit his intentions on the published frequency for Elmsett.

That said, there were several inaccuracies in the UK AIP entry for procedures at Elmsett, which may have caused confusion in the minds of both pilots. At the time of the incident it was commonplace for the Elmsett A/G station not to be manned during the weekend at times when the airfield and ATZ were published as being open. All movements are PPR and apparently the practice was to inform pilots of the unavailability of A/G radio when they were given the PPR.

Current regulations are open to interpretation and not easily found, even by specialist staffs. The relevant reference is at CAP 452 Ch 3 Para 1, rather than in the more obvious location of the ANO or the UK AIP. This requires airfields to have (a minimum of) an ‘A/G service during the published hours’. CAA DAP advise that the published hours for an A/G service should be the same as the published hours

AIRPROX REPORT No 141/03

of activation of an associated ATZ which in turn are normally the same as the hours of airfield opening. This procedure was not followed at Elmsett.

The Rallye pilot was apparently aware that there was no A/G service available at Elmsett on the day of the incident and adopted, what he believed to be, a sensible alternative. However, this alternative was not the same as the procedures adopted by the Cougar pilot which were in accordance with the, albeit inaccurate, AIP entry. Further, there were discrepancies between the information published in the UK AIP and that published in Pooleys Flight Guide (and, although not relevant to this incident, the RAF Minor Aerodromes Flight Information Publication). Specialist Members also informed the Board that they would expect airfield operators to check their AIP entry and Pooleys Flight Guide regularly and to ensure that the information provided to other aviation publications is up to date and accurate.

Members concluded however, that the correct action of the Cougar pilot in executing a go-around when he saw the Rallye enter the runway had prevented a risk of collision.

PART C: ASSESSMENT OF CAUSE AND RISK

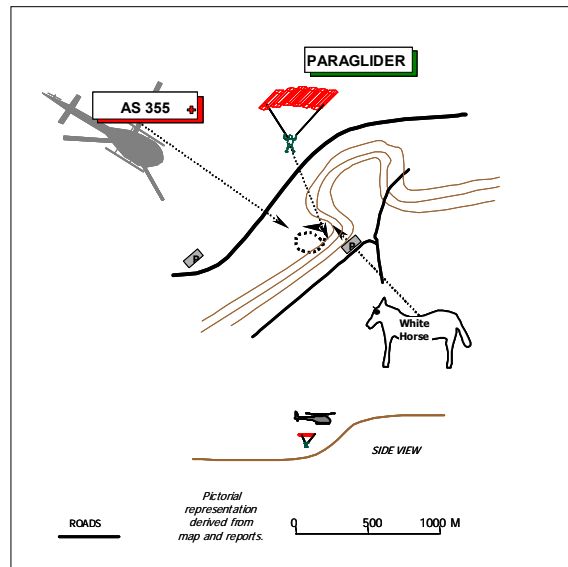
Cause: The Rallye pilot entered the runway and took off into conflict with the Cougar which was on short finals.

Degree of Risk: C.

Contributory Factors: The Elmsett A/G station was not manned as required by CAP452, Ch3, Para1.

AIRPROX REPORT NO 142/03

Date/Time: 9 Sep 1100
Position: 5116N 00209W (Westbury Whitehorse)
Airspace: London FIR (Class: G)
Reporting Ac Reported Ac
Type: Paraglider AS 355
Operator: Civ Pte Civ Comm
Alt/FL: 50-80ft 100-200ft
Weather VMC VMC
 Below Cloud Below cloud
Visibility: 20km >10km
Reported Separation:
 80-100ft H 300-400' H
Recorded Separation:
 NR

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

THE PARAGLIDER PILOT reports flying a red paraglider from a ridge launch site near Westbury, planning to soar the ridge and land in the car park at the bottom. He was flying on a N heading at about 10kt parallel to the ridge when a helicopter approached and circled near the launch site while several other paragliders and hang gliders were soaring. It came very close to several non-powered soaring ac.

The paraglider pilot was informed by one of the four hang glider pilots who witnessed the incident from the launch site, that at one stage the helicopter pilot's circuit took it above him, although presumably not directly above since that would have caused his canopy to collapse. Shortly after the first encroachment the helicopter came into his view again circling very low at approximately 100ft above the fields at the bottom of the ridge. At that time he had gained enough height to return immediately to the landing area on top of the ridge. Another hang glider pilot who saw the incident from the car park on top of the ridge provided photographs of the helicopter.

One of the hang glider pilots at the launch site attempted to signal the helicopter pilot to move away from the area but the helicopter pilot either ignored his gestures or did not understand the danger that he was causing.

THE AS 355 PILOT reports flying a grey ac with the anti collision lights switched on, on an 'Aerial Scout' sortie for a photographic company in the vicinity of the Westbury White Horse. While flying a 360° turn in the hover at less than 20kt between 100 and 300ft agl he closed with several hang gliders and paragliders soaring on the ridge which he had first seen from a distance of 5km. He proceeded cautiously and slowly and kept more than 200ft laterally away from them which he believed to be a safe distance and therefore he considered that there was no risk of collision.

THE BHPA comments that the paraglider pilot was naturally and correctly concerned that the considerable amount of air displaced by a helicopter could have caused his wing to collapse at such a low height that he would have been unable to either effect a recovery before hitting the ground, or been able to deploy his reserve parachute. Soaring ac can be found in the vicinity of any slope and at any height from ground level upwards.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board considered the actions of the helicopter pilot to have been a poor display of airmanship and unwise. He saw the paragliders from a distance of 5km but chose to continue to close to within a few hundred feet of their position and flew both above and below them. Further, he ignored the Rules of the Air which afford right of way to the paragliders and in doing so endangered them by flying his ac close enough to cause concern that canopy collapse might have been a possibility.

In addition, based on the information in his own report, members pointed out that he contravened the ANO Sect2, Rule5 (1) (e) of the ANO: '*An ac shall not fly closer than 500ft to any person, vessel, vehicle or structure*' (in this case the rule was deemed to apply to persons on the ground and in the air). Although exemption may be granted for Photographic Missions, this flight was not in this category.

However, although demonstrating an unprofessional approach, the AS355 pilot maintained, albeit inadequate, separation from the paraglider and Members concluded that there had not been any risk of collision.

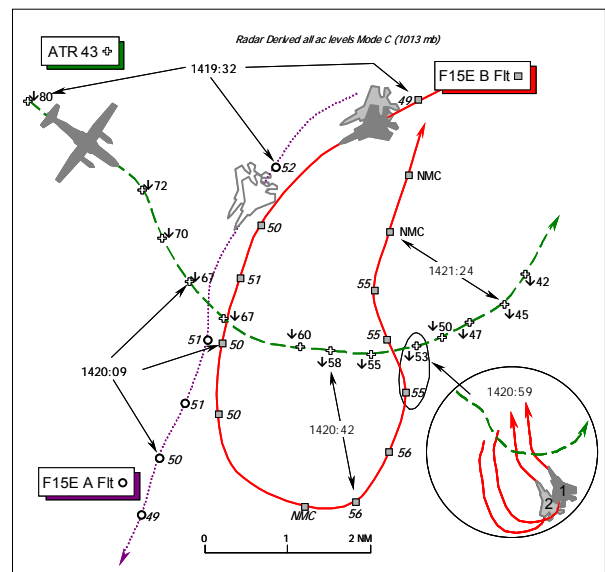
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The AS355 pilot flew unnecessarily close to the paraglider.

Degree of Risk: C.

AIRPROX REPORT NO 143/03

Date/Time: 10 Sep 1420
Position: 5143N 0404W (7nm N of Swansea)
Airspace: London FIR (Class: G)
Reporting Ac Reported Ac
Type: ATR42 - 300 F15 pair
Operator: CAT Foreign Mil
Alt/FL: 8000ft N/K
 QNH (1015mb) (N/K)
Weather VMC VMC CLAC
Visibility: 10km NR
Reported Separation:
 1nm H/500ftV 1-2nm H/1000ft V
Recorded Separation:
 0-54nm H/200ft H @ 1420:59

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

THE ATR42-300 (ATR43) PILOT reports his ac has a predominantly white company livery but did not specify whether the HISL was on. Inbound to Swansea from Cork IFR, he was in communication with SWANSEA APPROACH on 119.7MHz squawking A1430 with Mode C; TCAS is fitted. Flying at 235kt, descending through 8000ft Swansea QNH (1015mb) VMC 'on top', heading SE about 12nm N of Swansea he thought, to intercept the 8d arc of the SWS for a direct arrival to RW22, 2 F15 ac were suddenly spotted as they crossed ahead from L to R descending to 1000ft below his ac. The F15 jets then banked left, turned about and crossed back again from R - L about 1nm ahead he thought, and 500ft above his ac as he turned L to avoid them. TCAS enunciated an RA to "MAINTAIN VERTICAL SPEED" twice, which he did until the F15 pair opened to port and the conflict was resolved. He assessed the risk as "low to medium".

THE F-15E PILOT reports he was leading the second flight of two grey F15E ac – F15E B Flt - that was part of a 4-ac formation and he was flying in VMC some 3000ft above cloud. They were not in receipt of an ATS, but squawking A7000 with Mode C whilst flying against another similar pair – shown as F15E A Flt. He initially acquired the ATR43 at a range of 2nm and called out the traffic to his wingman who spotted the ac as it came into their 10-11 o'clock position. Both he and his wingman maintained visual contact with the ATR43 during the left turn. His No2 was flying in a 2000ft fluid formation positioned 45° degrees aft off the starboard quarter on the outside of the L turn, but then moved to port as they completed the climbing left turn to avoid the airliner. The Flt passed astern and 1000ft above the airliner, which he thought was flying perpendicular to their flight path 1-2nm away.

He reaffirmed that he was visual from a range of about 2nm away and they were operating under VFR at the time, adding that in his view the ATR43 was not perceived as close enough to report and the risk was assessed as "none".

UKAB Note (1): The F15E B Flt leader provided a diagram to accompany his report that indicated the Flight disposition during the occurrence, which is reflected in the diagram inset. He thought erroneously that the ATR43 had maintained a course perpendicular to the jets' track after their crossover turn.

ATSI were unable to comment as no RT report was made to SWANSEA APPROACH at the time of the Airprox.

AIRPROX REPORT No 143/03

UKAB Note (2): The Clee Hill SSR recording illustrates this Airprox clearly but only shows the leading ac of the two F15 flights which are squawking; the respective wingmen are not evident separately. The ATR43 is shown descending through FL80 at 1419:32, as the first flight of two jets - F15E A Flt - are at 10 o'clock crossing from L – R flying generally level at FL52 Mode C, followed by F15E B Flt – the ac probably seen by the ATR43 crew - about 2nm in trail. F15E A Flt cross ahead of the ATR43 some 2100ft below the airliner possibly unseen by the crew, followed by the subject B Flt flying level at FL50 at 1420:09, passing from L – R as reported at a minimum range of 0.83nm from the airliner some 1700ft below it. A Flt continues to the SW and clears as B Flt execute the reported left turn about, climbing 600ft in the turn to FL56 at 1420:42, when the ATR43 is shown some 200ft above the jets in a continuous descent through FL58 Mode C. F15E B Flt is shown at FL55 turning to pass astern of the ATR43 at 1420:59, when the turboprop is 200ft below the jets after descending through their level and shown 0.54nm to the N – the point of minimum horizontal separation; it was during the turn that the F15 Flt leader reports his wingman executed a crossover to port. The F15E B Flt then opened to the N and descended out of coverage as the ATR43 turned NE bound descending through FL45.

HQ 3AF comments that this seems to be another incident, that took place in VMC in Class G airspace, where each pilot's perception of risk was based upon whether or not they had each other in sight and on what was a sensible miss distance. Clearly, the lead of F-15E B Flt was fairly relaxed over the closest point of approach as he considered there to be no risk of collision yet his formation passed close enough to the ATR43 to trigger a TCAS RA and to cause its pilot to judge that there had been a risk of collision, albeit low to medium. Although the F-15E B Flt lead aimed to pass comfortably above and behind the ATR43, it seems probable that his No 2's cross-over manoeuvre might have caused the intended separation to erode to the point where the ATR43 pilot judged an Airprox had occurred.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Civil controller members were concerned that although the ATR43 pilot reported that an RA was enunciated by TCAS, this information was not disclosed to ATC, who were unaware of the occurrence. The ATSI advisor pointed out that the ATR43 crew was in receipt of a procedural service here and not a radar service as none is available. A CAT pilot member explained that if compliance with an RA did not require departure from the clearance received from ATC, then it was not essential to inform the controller immediately and in this instance the 'passive' nature of the commanded RA merely required the ATR43 crew to continue with their descent. Here, the ATR43 crew would have been busy keeping an eye-out for the jets, whilst also navigating the procedure and following the RA, but controller members reinforced the wisdom of keeping ATC apprised of what was going on. On a slightly different tack, the ATR43 pilot had not filed an Airprox report on RT, which was a matter of concern to the Board as a whole. Whilst ATC had no influence on this occurrence, pilots must ensure that controllers are made aware of Airprox reports promptly, because doing so triggers timely actions to enable full information to be gathered so that the whole picture can be ascertained. If subsequently the pilot elects not to proceed with the Airprox then nothing has been lost.

The radar recording showed 2 pairs of F15E jets had flown past the ATR43 – the first pair (F15E A Flt) probably unseen by the ATR43 crew, with the trailing B Flt unaware of the presence of the airliner in the first instance as the jets passed some 1700ft below it. The HQ 3AF advisor explained that B Flt leader had not spotted the ATR43 until he had initiated the left turn about and then promptly informed his wingman who spotted the airliner also descending toward them. Some members thought that there was an element of uncertainty here; the ATR43 crew would have wondered what the jets would do next, especially when the No2 executed a cross-over in the turn – placing the airliner crew in a difficult situation; all they could do was maintain their steady descent and be prepared to react, not knowing which way the jets would go. TCAS then also played its part by reaffirming that continuous descent was

required. Members emphasised that although the F15s had flown close enough to trigger an RA, this did not mean that an Airprox was automatically warranted. However, unbeknown to the ATR43 crew the F15E B Flt leader had seen the ac from 2nm away and turned to pass astern of the airliner according to the radar recording. The B Flt leader's avoiding action only afforded 200ft above the ATR43 and just over ½nm at the closest point, but 500ft was achieved when the F15s passed astern. Despite the F15's vector being behind the airliner at these ranges it was enough to induce an RA – as occurred here. It was explained that the position of the No2 F15 would not have affected the leader's freedom to manoeuvre unduly, so some members thought that the leader could have given the airliner a wider berth and clearly this did cause concern to the ATR43 pilot. As it was the ATR43 crew was following an IFR procedure in Class G airspace without the benefit of ATC radar assistance but had spotted the F15s in good time; the F15 crews were operating under VFR and saw the airliner in time to turn and avoid it. Each pilot was legitimately engaged in their individual tasks and ultimately each had seen and avoided each other's ac. From all of this the Board concluded this Airprox had been the result of a conflict in the FIR and whilst both pilots' assessments of the minimum separation were somewhat wide of the mark, in the Board's view it was enough to eliminate the risk of a collision in these circumstances.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in the FIR.

Degree of Risk: C.

AIRPROX REPORT No 144/03

AIRPROX REPORT NO 144/03

Date/Time: 27 Aug 1135

Position: 5205N 00019W (Shuttleworth Old Warden Airfield 110ft)

Airspace: London FIR (Class: G)

Reporting Ac Reported Ac

Type: Condor D62C C172

Operator: Civ Pte Civ Club

Alt/FL: 250ft 0ft
(QNH) (N/K)

Weather VMC VMC

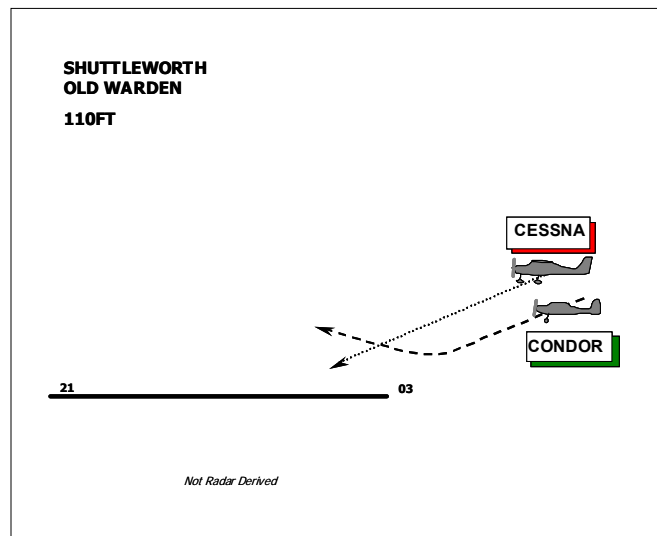
Visibility: >10km 10km

Reported Separation:

10-20ft V 10-20ft H30m

Recorded Separation:

N/R



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE CONDOR D62C PILOT reports flying a cream and purple ac, with no lights or SSR fitted, from Andrewsfield to Old Warden to visit the aviation museum and since the airfield is non-radio except on flying display days he was not in radio communication with any agency. Following a standard overhead join and a right hand circuit for R/W 03 and while heading 30° at 60kt and 250ft on short finals he suddenly became aware of another ac directly above him (estimated 10–20ft) also descending on its final approach. The other ac's approach speed was greater than his and it continued to descend and landed directly in front of him. His immediate reaction was to turn left on to the dead side of the R/W and execute an emergency "go-around" from which he completed another circuit and landed safely. In conversation later the other pilot stated he did not see the Condor at the time; aero modellers who were at the airfield however witnessed the incident. He reported the incident to the staff at the museum and sent in a CHIRP report.

THE C172 PILOT reports flying a Maroon and White ac with the beacon selected on squawking 7000 with Mode C from Gloucestershire Airport to Old Warden, having obtained PPR by telephone prior to take-off, and was told to join overhead because of model ac flying. After working Luton App he called Old Warden on 130.70 and since there was no reply to his inbound call he concluded that there was no one on watch. He circled in the overhead, looked for other traffic and making sure the aero modellers had seen him, then made a blind transmission before descending dead side and no traffic was seen on the descent, crosswind or downwind. A further blind transmission was made downwind and again nothing was seen or heard, so he turned base for a normal 800ft circuit and then turned finals. Again no other traffic was seen and he made a further blind call of finals for 03. The first time he was aware of other traffic was over half way down his landing roll when he saw an ac 30m away climbing on what appeared to be a go-around. In a conversation with the pilot of the Condor afterwards he did admit that he was not monitoring the frequency; his radio was switched off because he did not think it was necessary.

He was not aware of the presence of the other ac visually or orally in the overhead, descending dead side or in the circuit until after they had landed.

UKAB Note (1): Shuttleworth (Old Warden) is an unlicensed airfield. Pooleys Flight Guide for the UK states 'c/s Shuttleworth Information/Radio 130.70 AFIS or A/G (Displays or special events only)'.

[There was no display or special event on 27 Aug 03.] It also states 'Standard overhead joins mandatory'. Also 'Following an overhead join, a full circuit must be flown at 800ft'.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted solely of reports from the pilots of both ac.

The Board viewed this as a most serious, if straightforward, incident.

It was clear from the honest reports provided by the pilots that the C172 pilot did not see the Condor and was therefore unable to avoid it. At airfields without the benefit of an ATZ and an air-to-ground RT service, it is even more important than usual to maintain a good lookout and to expect other circuit traffic. The Board considered that the C172 pilot's use of the radio to make blind calls and listen for other ac on the Old Warden frequency was good practice as a supplement to good lookout. That the Condor was fitted with a radio and the pilot opted not to use it, was thought lamentable by some and had he too made similar blind calls or even listened to those made by the other pilot, the incident would most likely not have occurred.

Nonetheless this was class G airspace, the C172 was overtaking the Condor and the pilot had the opportunity and responsibility to see it and to avoid it, but for whatever reason he did not. Despite the very late go-around executed by the Condor after the event, at the actual point of the Airprox the ac were separated by only 20ft and the pilots had not seen each other; the Board therefore considered that, in this instance, only good fortune had prevented them from colliding.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A non-sighting by the C172 pilot who over flew the Condor on short finals.

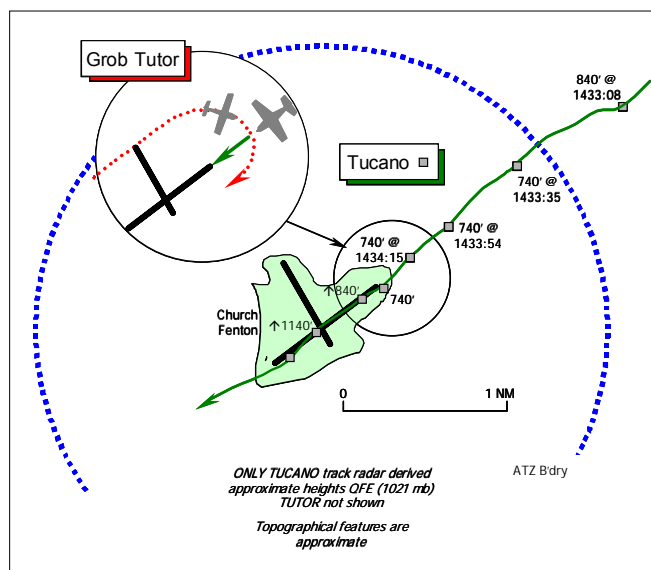
Degree of Risk: A.

Contributory Factors: The Condor pilot did not have his radio switched on.

AIRPROX REPORT No 145/03

AIRPROX REPORT NO 145/03

Date/Time: 16 Sep 1434
Position: 5350 N 00111 W (Finals RW24 Church Fenton - elev 29 ft)
Airspace: MATZ (Class: G)
Reporting Ac Reported Ac
Type: Tucano T1 Grob Tutor
Operator: HQ PTC HQ PTC
Alt/FL: 700ft 800ft
(QFE 1021mb) (QFE 1021mb)
Weather VMC CLOC VMC CLOC
Visibility: 15-20km 30km
Reported Separation:
100-150ft V 150ft V/150ft H
Recorded Separation:
NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE TUCANO T1 PILOT, a QFI reports he was acting as the safety pilot with a refresher student flying an IF sortie under an IF visor from the front seat. They were flying a PAR 'azimuth only' approach to RW24 [RHC] at Church Fenton with a MDH of 670ft, whilst in receipt of a TALKDOWN from Church Fenton on 386.725MHz. A squawk of A4541 was selected with Mode C, but neither TCAS nor any other form of CWS is fitted. The ac has a black/yellow colour scheme and the landing lamps, HISLs and nosewheel lights were all on.

Heading 240° at 110kt on the approach, the student levelled the aeroplane just above MDH and accurately maintained 700ft Church Fenton QFE (1021mb). At about 2¼nm finals they were cleared to 'OVERSHOOT' with '3 in' the visual Cct - one of which was 'going around'. He immediately gained visual contact with a white Grob Tutor, which was 'going around' from the end of the downwind leg. As they commenced their "go-around" the Tutor turned to cross the extended centreline and it became apparent that he was at the same height as his Tucano. The Tutor pilot maintained his height at about 720ft QFE throughout the 'go-around' from downwind. As the Tutor approached from the starboard beam toward "the merge" he took control from the PF and descended to avoid a collision. The Tutor passed overhead in a level R turn about 100 – 150ft directly above his Tucano. He assessed that there was no actual risk of collision because he was visual with the Tutor continually from after the ATC clearance. However, he added that if he had not taken control from the student flying under the IF visor, there would almost certainly have been a collision.

THE GROB TUTOR PILOT, a student pilot, reports that he was a flying a 30min solo circuit consolidation sortie [trip 16 of the Elementary Flying Training syllabus] with Church Fenton TOWER on 225.5MHz. His ac has a white colour scheme; the landing lamp and HISL were on.

Flying right-hand downwind for RW24 RHC in the light ac Cct at a height of 800ft QFE, TOWER informed him that another Tutor ac was carrying out a practice forced landing and was crosswind between LOW & HIGH key. Accordingly, TOWER instructed him to 'go around'. He was also aware of a Tucano ac on a radar approach, which he had spotted at about 1½nm. As he started the turn into the 'go around', TOWER asked if he was visual with the Tucano radar traffic, which he confirmed he was. Upon rolling out of the turn on the 'DEADSIDE' of RW24, heading 210° at 80kt, he observed the Tucano out to starboard about 150ft away and 150ft below his ac. He assessed the risk of collision as "low".

THE CHURCH FENTON AERODROME CONTROLLER (ADC) reports that he was acting as mentor to a controller under training (UT) in the TOWER position at Church Fenton. A locally based Tutor was circuiting to RW24 RHC when the student pilot called "Downwind Glide Roll", whereupon the UT reported one ahead between HIGH & LOW KEY and asked if the student was visual. The Tutor pilot replied negative, so he was instructed to 'go-around'. At about this point the 3nm call was received from TALKDOWN for the Tucano to 'overshoot'; a clearance delay - 'call by two' - was issued and broadcast on the TOWER frequency of 225.5MHz. At this point he turned his attention to the Tutor's position, concerned that its student pilot might get close to PFL traffic and he half expected him to go around from his current position. However, the Tutor pilot continued downwind and the PFL ac descending from HIGH KEY appeared to be making a wider pattern than normal, thereby remaining clear of the Tutor. The 2¼nm call was then received from TALKDOWN, so the Tucano was cleared to 'overshoot' and a broadcast was made. Shortly afterwards he noticed the Tutor pilot had turned crosswind in the vicinity of the Tucano that was executing a high overshoot. As there was no time to inform TALKDOWN of the Tutor's position, he instructed his UT to confirm that the Tutor pilot was visual with the Tucano radar traffic. The UT initially asked the Tutor pilot if he was visual with the overshooting Tucano, to which the pilot replied, "affirm". The Tucano crew executed their overshoot and did not appear close to the Tutor at the time. The subject ac were in closest proximity between the RW24 threshold and ¼nm finals. The Linton-on-Ouse SUPERVISOR informed him about 5min later that the Tucano pilot was filing an Airprox against circuit traffic.

[UKAB Note (1): The 1350UTC Church Fenton weather report gave a surface wind of 250/7kt; 30km nil weather; SCT @ 15000, BKN @ 25000; QFE 1021mb; cc BLUE.]

MIL ATC OPS reports that the student Tutor pilot was operating in the Church Fenton Cct with Church Fenton TOWER. The Tucano crew was being provided with a talkdown by Church Fenton TALKDOWN. At 1430:26, TALKDOWN advised the ADC by landline that the Tucano was "...7 miles....to overshoot depart". This information was broadcast to the Cct traffic by TOWER at 1430:31, "*Tucano 7 miles to overshoot*". The 5 mile call was received at 1431:30 and, once again, this information was broadcast to the aerodrome Cct traffic "*Radar Traffic 5 miles*". At 1432:16, the Tutor pilot reported "[C/S] *downwind glide roll*", however, the ADC questioned whether the student pilot was "...visual with [other]...traffic between HIGH and LOW KEY?", on discovering he was "...not visual" the Tutor pilot was instructed at 1432:26, to "*go around*". The Tucano's 3-mile call was received from TALKDOWN at 1432:38, however, the ADC was unable to issue a clearance and TALKDOWN was instructed to "...call by 2". The delay message "*Tucano 3 miles continuing*" was duly broadcast by TOWER to the Cct ac at 1432:44. TALKDOWN made the 2¼nm call at 1433:00, and a clearance "[Tucano C/S] *clear to overshoot 3 in*" was issued by the UT ADC at 1433:05, with the broadcast made on the TOWER frequency at 1433:08, "*Tucano 2 miles to overshoot*". At 1433:25, the Tutor pilot reported that he was "*going around*" so the ADC enquired if he was "*visual with the radar traffic*"- the Tucano – to which the Tutor pilot reported "*visual*". At 1433:46, TALKDOWN advised the Tucano crew they were at "*1 mile [from touch-down] approaching the missed approach point [0.5nm finals for RW24] slightly left of the centre-line*", whereupon the Tucano crew retorted, "...just calling an Airprox on the going around ac" and identified the Tutor ac by its registration letters. When asked for clarification the QFI advised "*He was too close to us, he appeared to er.....[un readable words]...on the approach and he was going around...I had to actually descend below him in order to miss him*". The next call from the student Tutor pilot to the ADC was at 1435:57, when he reported "...downwind roll".

As a result of a previous incident at Church Fenton [Airprox 3/02] an additional broadcast call for radar traffic at 5nm was introduced to aid the integration of IFR and circuiting VFR traffic. It is apparent that the rules for integrating radar traffic into the visual circuit as laid down in JSP 552 and amended by local orders were adhered to by the ADC and TALKDOWN. Furthermore, JSP 552 320.105.4 states that "*it is the responsibility of the pilot to avoid bunching in the circuit*". 'Go around' procedures are at JSP 552 320.105.8, which stipulates:

AIRPROX REPORT No 145/03

When instructed to 'go around' pilots are to climb up and rejoin the circuit. If it is not safe to do this, ATC is to be informed instantly.

When overshooting, pilots are to do so to the dead side of the runway in use.

The Tucano crew was following a recognized IFR approach procedure and had been issued a clearance to use the runway. It matters little that the Tucano was intending to overshoot as the runway was his to use, therefore, as the Tutor had been instructed to 'go around', the student pilot should have given the Tucano a wider berth. Procedures have been reviewed in an effort to enhance safety. Whilst the clearance issued during a talkdown only requires the Cct state [the number in the Cct-3] to be passed, the Unit have developed a procedure whereby the ADC will (via the TALKDOWN controller) advise radar traffic that is at or inside the final clearance point of all ac going around in the visual Cct.

[UKAB Note (2): This Airprox is not shown on the Claxby radar recording. Only the Tucano is shown on SSR throughout its approach as it tracks the centreline to RW24 maintaining a height of about 740ft QFE (1021mb) – as converted from the indicated Mode C. The avoiding action descent reported by the Tucano QFI is not reflected on the radar recording, before the 'overshoot' is executed as the ac passes the vicinity of the upwind threshold.]

THE TUCANO PILOT'S UNIT comments that this incident highlights the potential hazards of mixing IFR & VFR traffic in a busy training aerodrome Cct. A collision was avoided here, because of the lookout and sound airmanship of the Tucano safety pilot. The solo Tutor student was clearly distracted by the PFL and the ATC instruction to 'go-around'. He then omitted to maintain visual contact with the Tucano during the 'go-around' by crossing the RW centreline in front of the instrument traffic. A review of procedures has now been completed by the Station, which has stipulated in the Flying Order Book that ac downwind in the Cct are to go-around behind instrument traffic when it is at or within 3nm finals.

THE TUTOR PILOT'S UNIT comments that there is always a risk of such incidents at training aerodromes such as RAF Church Fenton, when ac are making instrument approaches into a busy visual circuit. On this occasion, an EFT student with only limited flying experience went around as instructed but close to inbound traffic. Unless the Cct is sterilised for instrument traffic, all pilots have to ensure that they maintain adequate lookout as they approach the Cct, even if they are carrying out an instrument approach. RAF Church Fenton is after all a training base and QFIs must be cognisant of every ac, which might become a confliction.

[UKAB Note (3): This Airprox has some similarities to Airprox 3/02, which prompted further analysis of the intentions expressed by the Tucano crew for their approach.

Examination of the FENTON APPROACH transcript reveals that when prompted by the request for their minima at 1425:56, the Tucano crew responded with their intentions "...670 [the MDH] **to overshoot carry out missed approach procedure depart to the NE 030 for low-level abort practice**". This was acknowledged by APPROACH, who at 1429:19, passed "*climbout details*" to the Tucano crew – "...*after your overshoot and once clear of the Church Fenton visual circuit you're cleared right turn own navigation heading 030 for your simulated low-level abort...*". The crew added directly afterwards "...*we are going to depart VFR to the NE...*"]

HQ PTC comments that both ac pilots had each other in sight and the Tucano QFI took control to prevent his student getting any closer to the Tutor. The Tutor student pilot should perhaps have delayed his turn to pass marginally behind, as well as above, the Tucano. (He has already had this basic airmanship lesson pointed out to him.) Nevertheless, despite the sound provisions of the Linton FOB, we are left with an uneasy feeling that there is something left unwritten about the "Common Law" of circuit priorities between VFR and IFR traffic. There have been too many, too similar reported lately to be confident that there is no confusion in anyone's mind.

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 HQ PTC member reinforced the Command's view that there was scant detail available on the principles applied within the visual Cct at military aerodromes in the main books of reference accessible by both pilots and controllers alike. He added that when executing a simulated IFR MAP, it was incumbent on pilots to exercise a sharp lookout when climbing away through the circuit area and the priorities between IFR and VFR traffic are not clearly laid-out for all to see plainly. Despite previous recommendations allied to this subject he opined that no headway had apparently been made at all and here was yet another Airprox encompassing this topic. Nevertheless, here the Tucano QFI safety pilot had done just that – even though his ac had priority as they flew through the Cct area - but his sound awareness and appreciation, coupled with his prompt avoiding action had forestalled a more serious situation. It was evident from the very comprehensive reports provided that the Grob Tutor's student pilot, forewarned by appropriate broadcasts and a prompt from TOWER had seen the Tucano on the approach at 1½nm from touchdown. In the Board's view, there were 2 possible explanations for what happened next. Either the student had not appreciated where the correct Cct priorities lay and thought, erroneously, that the Tucano crew would actively avoid his ac during his go-around. Alternatively, he had not realised how close the Tucano was when he flew cross-wind onto the DEADSIDE, which is when he reports he next saw it. Some thought the situation may have been complicated further by the heights of the respective ac – the Tutor in the light ac Cct at 800ft and in this instance the Tucano flying in toward the aerodrome just above the pilot's MDH at 700ft - whereas a more normal Cct height of 1000ft would have provided a greater degree or vertical separation between the two. The inexperienced Tutor student had been caught out here and the Board echoed his unit's sage words of advice to instructors. It was evident that the Tutor Student should have taken more account of the Tucano and ensured that he 'gave-way' to it, as was his responsibility, leading the Board to conclude unanimously that this Airprox had resulted because the Student Tutor pilot flew into conflict with the Tucano on final approach. Here the QFI was cognisant throughout of the ac in the Cct. Wisely he was looking out for them as they approached the Cct area, therefore he was in a position to take effective action when he realised that the Tutor was flying into conflict. The Board concluded unanimously, that his prompt avoiding action descent had removed the actual risk of a collision entirely.

The Board was also encouraged by the prompt review of procedures conducted by the unit. This had led to some sensible changes that student pilots could comprehend and adopt at the 'ab initio' stage, which would reduce the potential for a recurrence at Church Fenton. But some members were still concerned at the evident confusion over priorities in the circuit area as evinced by the investigation of this occurrence. This student was not alone and indeed he might be mollified to hear that instructors had also 'got it wrong' in recent years. The Board was reminded of similar previous Airprox reports, the recommendations made and the apparent reticence by MOD to rationalize the advice given. The CinC Fleet member explained that confusion was evident from the Tucano refresher student's RT to APPROACH and the controller's subsequent response. He emphasised that a VFR overshoot and an IFR MAP were essentially different procedures but what was then conveyed to the Cct traffic in the TOWER broadcast was that the Tucano would simply 'overshoot'. It seemed to some that this should be sufficient for pilots established in the Cct to think that the Tucano would climb out on the RW track, but differing perceptions between controllers and pilots of what is actually executed under certain procedures, priorities within the Cct and what is written in the regulations has been the subject of considerable debate between members in the past. Here, there was still scope for confusion as to what the Grob student expected the Tucano to do next. Military ATC procedures make no distinction with advisory TOWER broadcasts between an 'overshoot' from an azimuth only PAR to clear, a PAR to join the Cct, or a MAP. Military instructor pilot members recognised the potential for some uncertainty in this situation insofar as the 'overshoot' is a **visual** procedure (after applying power and initiating a climb),

AIRPROX REPORT No 145/03

the ac is first 'cleaned up' then flown onto the deadside (where one exists), with due regard to other Cct traffic, which the pilot must give way to if joining the Cct. In this instance, the Tucano was executing a MAP, an **instrument** procedure that involved climbing straight ahead over the RW allowing him priority. Some military controller members recognised these distinctions clearly, whereas others did not. They thought that once cleared at 2nm to 'overshoot', the runway was effectively the Tucano pilot's at that point. However, this view was made in full knowledge of the Tucano pilot's intentions after the 'overshoot', knowledge that had not been shared in as many words with pilots in the Cct. Notwithstanding the brief advice circulated by DASC after previous Airprox, the members felt there was room for further 'advertising' about these points, as they do not appear to have been 'hammered home'. The members recognised that these issues are not exclusive to training establishments, so the Board recommended that DASC on behalf of the military aviation community, in conjunction with HQ PTC, should conduct a widespread publicity campaign with particular emphasis on the interaction of instrument traffic within the visual circuit area, but with flying training units especially in mind.

PART C: ASSESSMENT OF CAUSE AND RISK

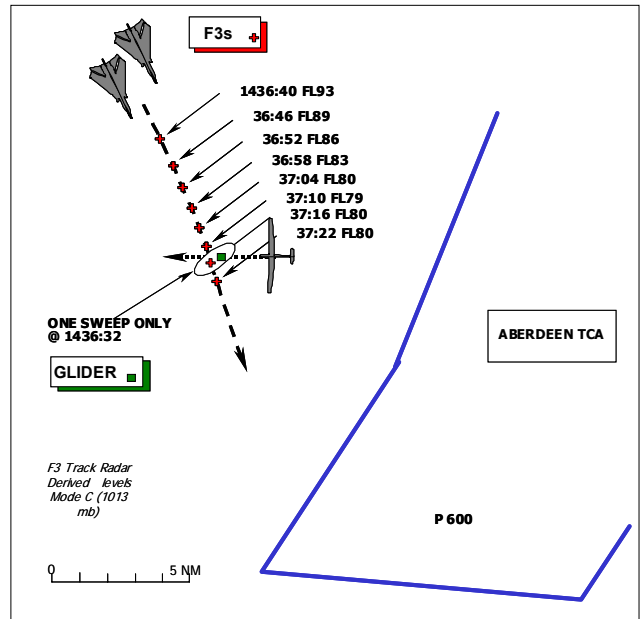
Cause: The Student Tutor pilot flew into conflict with the Tucano on final approach.

Degree of Risk: C.

Recommendation: That DASC, in conjunction with HQ PTC, should conduct a widespread publicity campaign with particular emphasis on the interaction of instrument traffic within the visual circuit area especially at flying training units.

AIRPROX REPORT NO 146/03

Date/Time: 17 Sep 1437
Position: 5700N 00300W (Aboyne)
Airspace: Scottish FIR (Class: G)
Reporting Ac Reported Ac
Type: Tornado F3 Libelle Glider
Operator: HQ STC Civ Pte
Alt/FL: FL80 6000ft
 (QNH)
Weather VMC VMC
 Haze Above sc cloud
Visibility: >8km >20km
Reported Separation:
 500ft H 500ft V 100yd H 300ft V
Recorded Separation:
 NR

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

THE TORNADO F3 PILOT reports leading a 2-ship of grey F3 ac in close formation with HISLs selected on 40nm N of, and on recovery to RAF Leuchars, squawking 7000C in receipt of a RIS from Scottish Military Radar. While heading 170° into sun at 400kt and level at 6000ft he first saw a white low wing glider at 1nm on his nose, at approximately the same height, but on an opposite heading, and on a collision course with his formation. He initiated a climb immediately and missed the glider by 500ft vertically and a similar distance horizontally.

THE GLIDER PILOT reports that he was flying a white glider with red wing tips with no SSR fitted having launched from Aboyne Airfield and in RT contact with them. He had been heading in a Westerly direction at 70kt for approx 15min and had descended from 19000ft to approx 6000ft having decided to turn back to the area of Aboyne Airfield and had just started to bank to the left but had not actually started turning when he saw 2 Tornados in close formation side by side approx 350ft directly above him, but just in front, crossing from right to left. They passed over him tracking from his 4 o'clock to his 10 o'clock and he was quite alarmed at the time as he had not seen them approaching.

At the time of the incident he had been flying for about 5hr

He was contacted by letter by the gliding club regarding the Airprox report but thought it must have been another glider as it was reported as taking place 1 mile SE of Braemar, several miles W of his position. Having discussed it with AIS Mil however, he realised that it must have been him as the radar showed the F3s as being much further E than first reported.

THE TORNADO STATION reports that this incident reinforces the need to maintain a good lookout at all times and to expect gliders well outside the immediate boundaries of their launch sites, both vertically and horizontally.

MIL ATC OPS reports that the F3 formation was identified by ScATCC(Mil) (Scottish) ".....FL 120 Radar Information.." at 1433:50. The ac were given own navigation to Leuchars and a descent to FL 75 was given inbound Leuchars, followed, at 1437:00, with a further descent given to FL 60. It was just after

AIRPROX REPORT No 146/03

this, at 1437:10, that the F3 crew reported that they had *"...just passed by a glider pretty close proximity down our left side our current position"* to which the controller reported *"...actually nothing showing on radar at all"*. The crews advised that they were *"continuing...descent to seven point five"* and descent to FL 60 was reiterated by Scottish *"...to go under the airway"*. The F3 crews were advised by Scottish of *"...glider activitynotified on our boards as intense glider activity in that area today but there is nothing showing on radar"* at 1437:40. After questioning by the crew it was confirmed that the gliders do not squawk and the F3 pair were transferred to Leuchars at 1438:00.

Analysis of the Aberdeen Radar recording shows intermittent contacts in the general area although nothing is visible as the F3s approach the Airprox position. At 1436:33 a contact does appear briefly in the F3's 12 o'clock at approximately 4nm but almost immediately fades from radar. At this time the formation was passing FL 97 in descent. The Airprox is reported to have occurred at 1437:00 and this is the time that the F3s, passing FL 83, reach the area where the contact was seen at 1436:33.

Although the area is annotated on ICAO charts as an Area of Intense Gliding Activity possibly up to FL 245 no depiction to this effect is promulgated in Military documentation. Nevertheless, an area of 3nm centred on Aboyne was subject to a NOTAM advising of intense glider activity (inc mountain soaring) during the period 7 Sep - 31 Oct 03, which should have provided pilots with the necessary warning of gliders in the area. Whilst it may have been prudent for the controller to remind pilots of their proximity to the published event, with no solid radar contacts showing for any significant length of time it is hardly surprising that such a prompt was not forthcoming. Equally, with the glider showing for less than 5sec, it is understandable that the controller did not observe it during his scan process.

Under a RIS however, pilots are wholly responsible for maintaining separation from other ac, whether or not controllers pass TI.

HQ STC comments that lookout is a lifesaver, and gliders with their thin aspect and camouflage colour are notoriously difficult to see. Furthermore, their lightweight construction and slow speed make them invisible to many types of radar.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The following is a synopsis of the written comments presented to the Board by the BGA representative who could not attend:

Even in reasonable VMC conditions the Tornados did well to spot the glider at all.

There appears to be a lack of mutual understanding by pilots of each other's operations in this geographic area. While good briefing will not eliminate such incidents, it will help to reduce them and give the crews better information.

Aboyne, Portmoak (at Loch Leven, and quite close to RAF Leuchars) and Feshiebridge (by Aviemore) are all major mountain wave sites and any time when wave is present, gliders will be climbing in the wave and several will be conducting cross country flights across Scotland at altitudes between FL50 and FL245, with highest concentration between FL70 and FL180. The best time of year for waves is from September through to April, but all these sites operate year round. When there is no wave activity, flights will be at much lower level, at hill or cloud base heights.

On the day of the incident conditions were good and it was likely there were over 20 gliders flying from Aboyne and probably a similar number from Portmoak.

Briefing is a two-way process and the gliding fraternity also need to communicate better with both Civil and Military ATC.

At the time of the incident, both ac were operating under VFR in Class G airspace, albeit with the Tornado in receipt of a RIS. Both pilots had an obligation to see and avoid other traffic. The Glider pilot reported heading W but since he reported the Tornados approaching from his 4 o'clock and departing to his 10 o'clock he was probably heading SW. The Tornados were seen heading SE on Radar. It follows therefore all 5 aircrew involved were in a position to see the other ac and eventually all did, albeit very late (about 10sec before their flight paths crossed). The Glider pilot did not see the Tornado formation until it flew past him, perhaps due to low arousal levels well into a very lengthy flight and so was unable to react. Through the haze the Tornado lead crew broke the white glider out from the background cloud just in time to take effective avoiding action albeit perhaps not as much as they would have liked had they seen it earlier.

That no TI was passed is not surprising as the glider was at best painting intermittently on radar, but perhaps a warning of gliding activity in the area, by the controller to the Tornados, would have been appropriate. The Board agreed with the BGA that in order to ensure that both civil and military pilots have the best background picture of likely levels of activity on any day, clubs too have a responsibility to ensure that high volume of glider activity is notified to both civil and military ATC units and they should establish workable links and procedures.

The Board however, agreed that in this instance since the Tornado had seen and avoided the Glider by a fairly reasonable margin, the pilot had fulfilled his obligation and that there had not been any risk of the ac colliding.

The Board was grateful to DASC who agreed to publicise this incident in order to increase awareness amongst military pilots of gliding operations.

PART C: ASSESSMENT OF CAUSE AND RISK

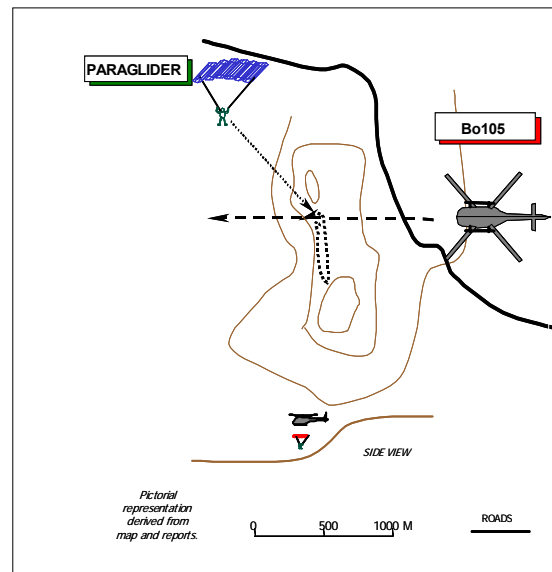
Cause: A conflict in class G airspace resolved by the Tornado Leader.

Degree of Risk: C.

AIRPROX REPORT No 148/03

AIRPROX REPORT NO 148/03

Date/Time: 14 Sep 1532 (Sunday)
Position: 5304 N 00314 W (Moel Y Waun)
Airspace: London FIR (Class: G)
Reporting Ac Reported Ac
Type: Paraglider Bo105
Operator: Civ Pte Civ Comm
Alt/FL: 1450ft 500ft agl
(50ft agl)
Weather VMC CAVOK VMC CAVOK
Visibility: 40km >10km
Reported Separation:
0 H 35m V NR
Recorded Separation:
NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE PARAGLIDER PILOT reports ridge soaring with a large blue and yellow canopy on Moel Y Waun at about 50ft agl heading S at 15kt when he heard a helicopter approach, first sighting it at a distance of 400m. It was a red single rotor ac flying at about 70kt and appeared to be tracking directly towards him. He turned away from the hill on to a Westerly heading and prepared himself for the collapse of his canopy. The helicopter was about 100ft higher than him and climbing and flew almost directly above on a Westerly heading as he turned. The following day he contacted ATC at Hawarden Airfield and tracing action resulted in correlating the incident with a red medical helicopter travelling from Wrexham Hospital to Ruthin.

THE BO105 PILOT reports flying a red and green air ambulance with strobes and landing lights on listening out on Hawarden frequency. Following the offload of a critical patient at Wrexham he was immediately re-tasked in response to a serious road traffic accident to the W. The flight was busy but he avoided a known glider site and took the best route to the incident through open airspace at 500ft agl climbing slightly at 120kt. At no time during the flight did he see any paragliders therefore he thought that there was no risk of collision.

THE BHPA comments that the paraglider pilot was naturally and correctly concerned that the considerable amount of air displaced by a helicopter could have caused his wing to collapse at such a low height that he would have been unable either to effect a recovery before hitting the ground, or been able to deploy his reserve parachute. Soaring ac can be found in the vicinity of any slope and at any height from ground level upwards. For mutual safety powered ac pilots should consider the advisability of approaching from behind ridges at less than 1000ft agl.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted solely of reports from the pilots of both ac.

The Board noted that the helicopter had been cresting a 1400ft ridge and was flying into the sun which was low in the sky. In addition, the blue and yellow canopy of the paraglider was below the skyline from the Bo105 cockpit and was similar in colour to the background terrain. Members believed that a combination of these factors had caused the helicopter pilot not to see the paraglider. They noted that

the transit height selected by the Bo105 pilot was 500ft agl, if weather conditions permit and it is not imperative to be that low, then expert members considered 1000-1500ft would be a safer cruise height. Having said that, the Board agreed that Class G airspace is open to all users and that hang and paragliders also need to take into consideration that there may be other ac legitimately operating at their height.

Although the paraglider pilot assessed he was 50ft agl and the helicopter was about 100ft higher, there was no corroboration and Members considered the possibility that the helicopter had been higher, but may have been descending after it had crossed the ridge. With this in mind, Members considered that although the helicopter pilot did not see the paraglider, the separation had been such that there had not been a risk of the ac colliding.

PART C: ASSESSMENT OF CAUSE AND RISK

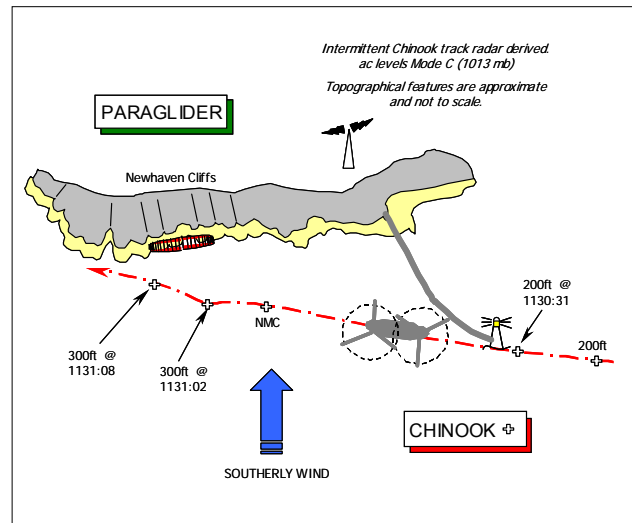
Cause: A non-sighting of the paraglider by the Bo105 pilot.

Degree of Risk: C.

AIRPROX REPORT No 149/03

AIRPROX REPORT NO 149/03

Date/Time: 19 Sep 1131
Position: 5047N 0003E (Newhaven Cliffs)
Airspace: London FIR (Class: G)
Reporting Ac Reported Ac
Type: Paraglider Boeing CH47D
Operator: Civ Pte Foreign Mil
Alt/FL: 220-250ft 500ft
amsl (Rad Alt)
Weather NR VMC NR
Visibility: "Good". >10km
Reported Separation:
100m H/50-100ft VNot reported
Recorded Separation:
NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE PARAGLIDER PILOT reports his large paraglider's wing is coloured red on top & white underneath. Whilst soaring in the rising southerly air above Newhaven Cliffs he heard the "thud thud" of a large helicopter. As the Chinook hove into view about ½nm away, he saw it was flying at about 300ft asl from E to W roughly in line with and along the water's edge/beach. He turned and "ran away" from the approaching helicopter and then turned towards it and "waved". But the Chinook maintained its course and took no avoiding action, which caused him to be very worried. He could neither fly to the N of the cliff face because he would fly into the turbulent 'rotor' effect, nor could he fly toward the helicopter. So no avoiding action could be taken before the helicopter passed no more than 100m upwind of his position [to seaward], some 50-100ft above him, at most; the subsequent downwash of the Chinook's twin rotor blades causing his wing to collapse about 40% on the right which induced a violent dive. He managed with some input to recover and dive forward, but it also took his glider behind the cliff edge into the disturbed air of the turbulent 'rotor'.

He could not believe the Chinook pilot could not see his bright red paraglider; it passed close enough that he could see into the cockpit, but the pilot simply did not give his paraglider enough room. Adding that a paraglider has no structure to withstand the downdraught of a Chinook helicopter and he only hoped that its pilot had noticed that he was there.

THE BOEING CH47D CHINOOK PILOT reports his helicopter has green camouflage scheme; navigation lights and red anti-collision beacons were on, but HISLs are not fitted. A squawk of A7000 was selected, he thought, with Mode C.

During a non-tactical VFR transit from the continent at 140kt, they were flying along the coast from Dover westbound to Shoreham, in level cruise at 500ft Rad Alt under a FIS from Shoreham on 123.15MHz. Flying in VMC between Eastbourne and Brighton a number of paragliders were observed and where necessary they altered course to the L in good time. None of these sightings gave them any cause for concern nor was any kind of sudden avoiding action necessitated.

[UKAB Note (1): In a subsequent discussion with UKAB staff the Chinook pilot advised that he was the ac captain in the LHS, with the PF occupying the RHS. Additionally a crewman was positioned at the starboard door as lookout. He reaffirmed that whilst inbound to Shoreham they probably had seen the paraglider flown by the reporting pilot but had possibly not accorded the paraglider as wide a berth as

may have been appropriate and did not disagree with the paraglider pilot's reported separation. He added that they might well have been establishing contact with Shoreham ATC at the time - who was very busy with a lot of traffic in the area – whilst obtaining aerodrome information and following ATC instructions. He understood the concerns of the paraglider pilot at the sight of a large helicopter - lessons had been learnt - he would certainly afford paragliders/hang gliders and microlights a wider berth where feasible in future.]

[UKAB Note (2): The UK Mil AIP at Vol III 1-1-3-8, specifies that foreign ac are not permitted to use the UKDLFS without MOD approval, which had not been obtained here beforehand. When operating at 500ft agl and above, helicopter crews are not required to make bookings with LFBC. Nevertheless, overarching all the foregoing, the UK Mil AIP at Vol III 1-1-3-8, specifies that all foreign ac (whether FW or RW) are to be booked into the LFS. Crews are expected to comply with avoidances listed in the UK Mil AIP Vol III. Which specifies at 1-2-18-4, that notified BHPA hang glider/paraglider sites may be activated and are promulgated to UK based military crews by UK (L) 'Y' series NOTAM. Such sites may be afforded a ½nm/1000ft agl mandatory avoidance and are listed in the respective LFA brief. However, there were no such sites promulgated for LFA18 at Vol III 1-2-18-5 within the extant document during the period of this Airprox. (Although Newhaven is now promulgated in the LFA18 brief at HG13.) Thus, the location of this paragliding was not promulgated by either a mandatory avoid or warning. Rotary wing ac are permitted to fly in the Brighton avoidance area not below 500ftmsd.]

[UKAB Note (3): Analysis of the Pease Pottage radar recording is inconclusive as, inevitably, the paraglider is not shown at all. However, the Chinook is shown intermittently – as an SSR contact only without supporting primary data – squawking A2000 (Ac from a non SSR environment) with Mode C, as the helicopter transits across the bay from the SFD VOR indicating 200ft Mode C (1013mb) inbound toward Shoreham. The Chinook passed over the vicinity of the Newhaven outer breakwater light at 1130:31, maintaining 200ft Mode C (1013mb), whereupon radar contact faded 5sec later. The helicopter appeared again at 1130:56, whilst converging with the shoreline but no Mode C was evident until the next sweep when it indicated 300ft – equating to about 450ft Shoreham QNH (1018mb awaited) the nearest available setting obtainable from Meteorological Office archive data. It is shown on the next sweep maintaining level cruise before fading once again – probably at about the location of the Airprox. The helicopter is not shown again until well to the W of the Airprox location in the vicinity of the Brighton Marina VRP associated with Shoreham aerodrome at 400ft Mode C, before fading entirely at 1137, close to Shoreham the Chinooks pilot's aerodrome of first intended landing in the UK.]

THE BHPA comments that the paraglider pilot's options would have been as limited as described. Where there is sufficient rising air to soar near cliffs, there is virtually always sufficient 'rotor' effect also to cause a paraglider's canopy to collapse; in these situations as the 'rotor' will probably continue down to ground level, expectations at best would be to crash land. It is fortuitous that this event remained the right side of the line between an incident and an accident.

A worryingly significant number of pilots of other ac have shown a lack of appreciation that a paraglider wing will suffer significantly greater effects from encountering turbulence than a rigid ac. A paraglider wing relies on a constant smooth airflow to retain its aerodynamic integrity. Therefore, paraglider pilots choose the weather conditions and terrain with due regard for their own and their paraglider wing's abilities. If a pilot is sufficiently competent to handle a certain level of turbulence they can what is termed "actively fly" to ensure the minimum number of changes in the shape of the wing. What is difficult to predict are the actions of other pilots. When a powered ac approaches a slope soaring paraglider or hang glider there are limited options for the soaring pilot to get away; he is unable to go up, has no real relative speed to move away and terrain may prevent movement in certain directions. Furthermore, knowledge of likely turbulence might discourage movement in certain directions. The possibility of being hit by wake turbulence is another danger, against which a pilot wants as much height as possible to effect a recovery therefore deliberately losing height is very unattractive. As an example of the degree or magnitude of turbulence being considered here, what feels like a small jolt in an ac the size and weight of a Cessna 150 (from say encountering another ac's wake) is sufficient to produce a total

AIRPROX REPORT No 149/03

collapse of a paraglider, which a very experienced pilot may control with about 200ft height loss, but which a trainee pilot may not be able to correct at all.

It is disappointing that the Chinook pilot chose not to give any separation distances for any of the paragliders seen, but even if a fear factor shortened the distances given by the paraglider pilot the Chinook came disconcertingly close to the paraglider.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board's advisor on low-flying explained that at the time of the Airprox, Newhaven was not listed as a recognised hang glider/paraglider site in the UK Mil AIP, although it was possibly listed by the BHPA. Consequently, the ability to NOTAM the site as active would have theoretically only been possible under AIC 55/2001 (Recreational Aerial Activities) if more than 5 hang/paragliders were operating - which based on the Chinook pilot's account seemed likely. No such notification had been given to LFBC and hence the Chinook crew would not have been able to find out about the activity even if they had booked into the UKLFS correctly – which they had not. Since this Airprox, all but winch launch hang glider/paraglider sites have been removed from the military low flying chart, although a more comprehensive list of sites has now been incorporated into the UK Mil AIP. He emphasised that the onus is now very much on hang glider/paraglider operators to notify LFBC of their activity (for which a free phone is available on 0800 515544 or free-fax on 0500 300120) so that appropriate NOTAMs can be promulgated to military flying units in a sensible time scale - giving them an avoidance or warning status as appropriate. A recent change to procedures now allows LFBC to accept advance notification from hang glider/paraglider site operators up to 2000hr (local) the day before for weekday activities Tuesday – Friday and up to 1600hr (local) on Sundays for Monday activities, thereby giving 'avoidance' status. Any time on the actual day would achieve 'warning' status. Here, if such a NOTAM had been issued and the Chinook crew had obtained the warning, it might have reduced the risk of the incident occurring. The salient point was that a measure of protection could only be afforded to hang glider/paraglider site operators if they informed the LFBC of their intended activity beforehand.

The Board agreed that although this foreign military Chinook crew unwittingly had neither obtained MOD approval for their transit within the UKDLFS nor obtained the applicable daily low-flying warnings - through an unintentional oversight - this had not affected the outcome of this encounter within the FIR. No warning had been promulgated because LFBC was unaware of the paragliding at Newhaven cliffs. Furthermore, the Chinook was subject to ATC instructions whilst inbound to Shoreham. Therefore, members agreed that the nub of this Airprox was one of lookout and the provision of safe visual separation by aviators in the see and avoid environment of Class G airspace. It was not entirely clear if the Chinook crew had seen this particular paraglider, but from the pilot's account it appeared that they had. They certainly should have been able to see it, as the ac Captain had posted a starboard lookout so the crux of this Airprox was the separation they had afforded. Given the constraints on the manoeuvrability of the paraglider, unbeknown to the Chinook crew at the time, it was their responsibility to avoid the paraglider by a suitable margin – that was entirely of their choice. From the comprehensive account provided by the paraglider pilot he had experienced a partial collapse of his wing because, in the prevailing southerly wind, the downdraught from the Chinook had disrupted the wing's aerodynamic integrity. The radar recording had shown the helicopter was flying at about 450ft ALT suggesting it was some 200-250ft above the paraglider, but at these levels evidently the 100m horizontal separation reported was not enough. BHPA had commented why this was so and members felt that the Chinook crew would have been more considerate had they been aware of the limitations of the paraglider. Moreover, a large number of other aviators probably had little appreciation of these effects, a situation that can only be improved through education. The helicopter crew thought they had given the paragliders sufficient berth, which was not the case and had unwittingly flown close enough upwind to

cause un-intended effects on the paraglider pilot's wing, which the Board concluded was the cause of this Airprox.

In their determination of the inherent risk within an Airprox report, the members are always mindful of the exacting remit which is placed upon the Board and the Chairman emphasised that strictly, any determination is based on the risk of a collision between the ac involved. Here it was the downdraught of the helicopter that had collided with the canopy and could have had just as catastrophic an effect on this paraglider wing without an actual collision taking place – more so than other flying machines with a rigid aerofoil structure. Evidently, safety had not been assured with the chosen separation that pertained here, but happily the paraglider had managed to recover the situation. Nonetheless, he should not have been placed in this situation. Mindful of this, some believed there was an actual risk of a collision during the incident here, whereas others did not think so. After weighing all the factors carefully, by a small margin, it was concluded that while the Chinook was never going to hit the paraglider, its downwash had and the result meant that the safety of the paraglider pilot had been significantly compromised.

The Board commended the Chinook Captain's frank admission that he had learned a significant lesson from this Airprox. The wake vortex/downdraught from large helicopters can have catastrophic effects on paraglider wings - far more than might be supposed by those unfamiliar with this form of flying - so to give them as wide a berth as feasible, especially when passing upwind of the site, would be wise. The Board also concluded that if this experienced rotary-wing aviator was not aware of the effects that can result then this lesson was worth emphasising 'around the fleet'. To this end the DASC advisor elected to promulgate the details of this Airprox in the DASC '*Feedback*' flight safety publication, specifically for the benefit of military helicopter pilots but also the military aviation community at large.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Chinook crew flew close enough to cause a partial collapse of the paraglider pilot's wing.

Degree of Risk: B.

AIRPROX REPORT No 150/03

AIRPROX REPORT NO 150/03

Date/Time: 22 Sep 1359

Position: 5455N 00458W
(5nm NE BLACA)

Airspace: Airway P 600 (Class: D)

Reporter: ScACC

First Ac Second Ac

Type: ATR72 Tornado F3

Operator: CAT HQ STC

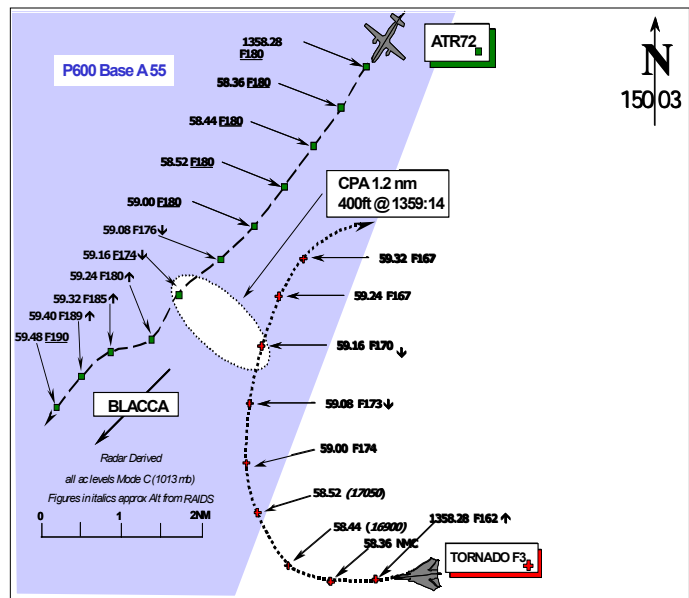
Alt/FL: NR 16815ft
NR (RPS 994 mb)

Weather NR VMC Above CI

Visibility: NR >30km

Reported Separation:
NR 1nm H

Recorded Separation:
1.2nm H 400ft V



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

ScACC reports that the ATR72 from Edinburgh to Cork was on 'own navigation' to GELKI on P600, tracking to the E of the centreline of the airway when 2 fast moving returns, squawking 7000, were seen to the E of the airway, heading W. The ATR72 was turned 20° to the right to ensure that it was established well inside CAS. The unidentified ac then entered the airway, without permission, 5nm to the S of the ATR72 and turned N, towards it, at a similar level. It was difficult to read the heights of ac squawking 7000 since the data blocks of the ac were overlapping and the increased size of the new font exacerbated the problem. There was insufficient time to rotate the labels to reveal more information.

The ATR72 pilot confirmed that he was receiving a TCAS warning.

There was insufficient time for the controller to initiate avoiding action so he instructed the pilot "to go with the TCAS resolution" and he passed TI on both unknown tracks.

Following the incident the ATR72 was observed at FL190, and the controller instructed the pilot to re-establish his original cruising level.

[UKAB Note (1): The RT transcript, line 69, discloses that the pilot reported a TCAS 'warning' after the TI had been passed by the controller; however, the pilot did not mention, at any time, that he had received an RA nor report a 'TCAS Descent'].

THE ATR72 PILOT was on a scheduled CAT flight from Edinburgh to Cork in a non-UK registered ac. He did not submit a report, despite his airline safety department being contacted on 6 occasions.

THE TORNADO F3 PILOT reports that he was the wingman of a pair of light grey Tornado F3s with HISLs selected on and squawking 7000C on a Combat Air Patrol sortie from RAF Leeming and not in contact with any ATC agency. While he was avoiding cloud and attempting to regain visual contact with his leader he did not notice that he was approaching the W boundary of P600. As he commenced a right turn passing through 020° at 300kt he noticed that they had strayed into CAS and saw an ATR72 appear from his 11 o'clock in a climb approx 3nm away. He immediately tightened the turn to clear CAS but passed approx 1nm to the SE of the ATR72.

ATSI stated that this report was compiled from information drawn from radar and RTF recordings and the ScACC Controller's and Unit Reports.

The ATR72 was routing from Edinburgh to Cork on P600 (Class 'D' CAS). The Airprox occurred 5nm NE of BLACA when 2 Tornado F3s penetrated the airway.

The crew of the ATR72 contacted the Antrim Sector, at 13:54, on a direct track for GELKI, which placed them initially just outside the E edge of P600. The flight was cleared to climb to and cruise at FL180 and was level prior to the Airprox. The Antrim Sector Controller's workload and RTF loading were light when he observed two 7000 squawks approaching the airway from the E, so he instructed the ATR72 pilot to turn right 20° to ensure that the ac was well inside the airway boundary. As the military ac continued towards the airway the controller asked the ATR72 pilot at 13:58:25 what his flying conditions were, to which he replied VMC. The controller then passed TI: *"... in your left eleven o'clock range five miles there's an encroacher entered Controlled Airspace indicating above flight level one five zero"*. This related to the northerly of the 2 targets and STCA triggered, with respect to this ac, at 13:58:42, when its Mode C indicated FL168 climbing and it was turning N towards the ATR72. At 13:58:59 STCA also activated with respect to the second ac when its Mode C indicated FL150 climbing.

[UKAB Note (2): The Northerly ac was the No2 of the formation and was the ac involved in the Airprox and for clarity only that ac is shown on the diagram above. The Leader was about 2nm S of his No2 and also infringed CAS by about ½nm but this did not affect the Airprox as reported].

In response to the TI, the ATR72 pilot replied : *"... he's just come up on our TCAS ... we're looking at it"*. and the dialogue continued as follows:

Controller: *"Roger ... take the resolution."*

Pilot: *"Yeah we're er a warning at the moment er six hundred feet below."*

Controller: *"Okay ... go with whatever you've got he's just gonna to the south of you range three miles."*

"... have you got traffic in sight left ten o'clock range two miles."

"And there's more traffic to you you've just gone past one the next one's back in your left nine o'clock range two miles indicating flight level one six five."

Pilot: *"Okay we've passed they're now on TCAS victor mike charlie."*

A few seconds later the controller confirmed that the ATR72 was now clear of the traffic and the pilot advised that: *"... we had no sight of them we just had a cloud in between ..."*.

The radar [Scottish] recording shows the 7000 squawks approaching the Airway on a WSW track. Had they remained on that track or turned left, it is likely that they would not have come within 5nm of the ATR72; however they commenced a right turn. The first 7000 squawk [The No 2 F3] entered CAS indicating FL173 climbing, in a right turn, in the ATR72's 11 o'clock position at a range of 3.9nm. It continued the right turn and passed down the ATR72's port side at a range of 1.2nm indicating 200ft [400ft on the Gt Dun Fell recording] vertical separation. The CPA was at this point when both ac were descending with the ATR72 indicating FL173 and the No2 Tornado FL171 [UKAB Note (3): On the Gt Dun Fell Radar FL174 and FL170 respectively]. The lead Tornado followed approximately 2.5nm behind, entering CAS at FL162 and passing through the ATR72's 9 o'clock position at a range of 2.6nm, before exiting CAS heading NE. At that time the ATR72 was climbing through FL182 while the lead Tornado was indicating FL166 climbing. During the encounter, the ATR72 initially descended, reaching FL173, before climbing back through its original level to FL190.

AIRPROX REPORT No 150/03

The Antrim Controller picked up the potential infringement and reacted by keeping the crew of the ATR72 informed and instructing them to turn right, so that the ac was well inside the Airway. With the benefit of hindsight, i.e. knowing that the Tornados continued in a right turn on to a NE track, it is evident that a hard right turn by the ATR72 would have increased the lateral separation; however, the intentions of the infringing traffic were not known. After the incident, the Controller reported that the disposition of the military traffic relative to the ATR72 made it difficult to offer effective avoiding action and there would have been very little time available to do so. A period of 23sec elapsed from the time the infringement took place until the CPA occurred. The Controller's handling of the encounter was somewhat unorthodox and contrary to instructions MATS Part 1. [See UKAB Note 4 below] By telling the crew, at the first mention of TCAS, to "... take the resolution ..." and "... go with whatever you've got ..." he was apparently assuming that the crew were in receipt of a TCAS RA. It would have been prudent to check first, since pilots are advised at CAP 579, Para 6.1 not to take avoiding action on the basis of TA information alone. Had the crew and controller adhered to the standard TCAS RTF phraseology and procedures, any ambiguity would have been eliminated. It is essential that controllers are left in no doubt as to what is happening in the cockpit with a minimum of delay, and are made aware when pilots are initiating avoidance manoeuvres.

[UKAB Note (4). MATS Pt 1, Sect 1, Ch 5, Para 14 '*Unknown Ac*' states:

'Action to be taken by controllers to avoid unknown ac in various types of airspace is tabulated below:

Class D Airspace...(Para 3) Give avoiding action if radar derived or other information indicates that an ac is lost, has experienced radio failure, or has made an unauthorised penetration of the airspace]

[UKAB Note (5): The sequence of events leading up to the incident was as follows:

The F3s were identified as potentially posing a conflict by the controller.

About 30 sec later

The conflict was reported by the controller to the ATR pilot.

Less than 10sec later

The pilot reported to the controller that '*he's just come up on TCAS*'.

Less than 10sec later

The Controller advised the pilot to '*go with the resolution*'.

Less than 10sec later

The ATR72 commenced a rapid descent from FL180 to FL174 (173 on Scottish Radar).

15 sec later

The descent was halted and a climb initiated with the ac bottoming out at FL174

40sec later

The ATR72 climbed rapidly through its original level of FL180 and topped at FL190.

2min later

The ATR72 re-established its cleared level of FL180.

No technical explanation can be offered which would explain this sequence of events].

THE TORNADO STATION COMMENTS that this avoidable incident highlighted some systemic failings within the planning phase for a sortie in OTA B, an area with known airspace limitations. The CAP was planned in Class G airspace bounded on all sides by CAS with a base of 5500ft, only 5nm from the end of the 'cold' leg. The decision to CAP at 15000ft therefore significantly increased the risk of the ac infringing CAS. Furthermore, the proximity of the CAP datum to Airway P600 left little margin for error in the event that the CAP timing had to be adjusted and this directly resulted not only in the Airprox, but the ac penetrating CAS. Errors in the navigational data prepared by the Sqn were not picked up in the brief and therefore, although the crews could have been given a graphical representation and reminder of the location of the airway, this facility was not used.

As a result of this incident Sqn aircrew have been briefed that CAPs are to be located such that fighters remain at least 5nm clear of CAS and the Sqn OTA Main Computer data has been reviewed and checked to ensure that it is possible to depict relevant airspace boundaries to the crew. The station management is content that lessons have been learned and steps taken to ensure that similar incidents do not happen again.

HQ STC comments that the Tornado Station remarks are well made. It is unacceptable for Combat Ready crews to penetrate CAS accidentally due to poor planning, poor SA and poor prioritisation. It is encouraging to note that the Stn has reviewed planning procedures, mandated wider margins for error and tighter procedures. As a result of this Airprox, Commanders of all Fast-Jet Stns are advised to reconsider the margins for error that they apply.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board was most disappointed that the ATR72 pilot, a professional airline Captain, did not provide a report that would have assisted them in determining some aspects of this investigation, which cannot otherwise easily be explained.

This was a complex incident with some puzzling sequences of events. The absence of any report from the airline pilot meant that specialist Members had to draw on their own extensive experience in reaching conclusions, rather than making deductions from reported facts.

The basics were however, very simple, namely the F3 formation entered the Class D CAS of airway P600, which was already occupied in that area, without clearance. Members were pleased to note that the Station concerned had put measures in place to ensure the perfunctory planning undertaken by the crews on this occasion should not happen again.

The sequence of actions by the controller, who spotted the potential infringement and confliction early, but did not manage to prevent the Airprox, is less easy to explain. MATS Pt 1 gives direction at the reference stated in Pt A on what controllers are expected to do in such circumstances. Although the type of '*TCAS warning*' mentioned by the ATR72 pilot may not at the time have been clear to the controller, if he was in any doubt, he should have requested clarification before assuming that it was an RA. With hindsight, it is clear that the pilot did not have an RA at the stage, when the controller stopped controlling the ac and instructed the pilot to '*go with the resolution*'. ATC specialists considered that good practice would have been to continue to provide a service by giving an Avoiding Action hard right

AIRPROX REPORT No 150/03

turn to the ATR pilot. Even taking the unpredictable intentions of the F3s into account this would most probably have increased the separation. Board Members reiterated strongly the importance of using correct terminology in complex situations. Had both the pilot and the controller done so, there would have been no confusion regarding the TCAS indications presented to the pilot. Members therefore considered that the decision of the ScACC Antrim Sector Controller to invite the ATR pilot to follow TCAS indications rather than giving avoiding action had been a significant contributory factor in this incident.

Due to the lack of information available to them, Members found the actions of the ATR pilot hardest to explain. From the best information available, they deduced that, at the precise time the Controller requested the pilot to *'go with the resolution'* the ATR pilot who had not specifically reported an RA, most probably only had the encroaching ac showing on his display or had a TA. Either way there were no RA (resolution) indications to follow at that juncture. He had however only been told by the controller that the encroaching ac were *'above flight level one five zero'*, not their exact altitude; at that stage he was at FL180. Furthermore, since the encroaching ac were probably outside the parameters required for TCAS to give any relative altitude information, the ATR pilot had no precise information, from either TCAS or the controller, on separation from the F3s. However, for whatever reason, he elected to enter a rapid descent and specialist Members considered that this action, which brought the 2ac closer together, would then have prompted TCAS to display an 'RA Climb' indication. This is one possible and plausible explanation for what the pilot did next. He changed from a rapid descent into an equally rapid climb. A few seconds after TCAS recognised that the ATR flight vector had changed from downwards to upwards, it would have indicated 'Clear of Conflict' but such was the rate of climb, it would again have taken the pilot some time to recover his ac as it overshot its cleared level. This logical deduction of the sequence of events would explain the flight profile taken by the ATR 72.

Although the radar recording shows the ATR72 descending towards the F3 and then climbing away only after the CPA, a majority of Members considered that this had not been a prime cause of the Airprox. Rather it had been another and important contributory factor which determined the proximity of the ac.

Members considered however, that bearing in mind the actual separation attained and the fact that the ac were flying away from each other at the CPA, there had not been a risk of their colliding.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The F3 formation entered CAS without clearance and flew into conflict with the ATR72.

Degree of Risk: C.

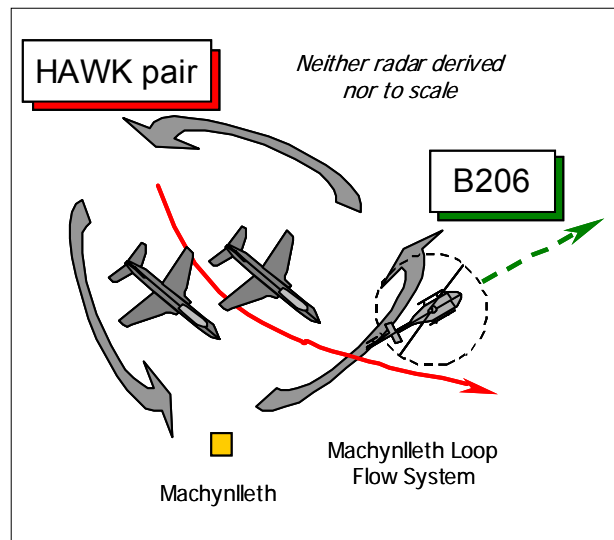
Contributory Factors:

The ScACC Antrim Sector Controller did not give avoiding action in accordance with MATS Pt 1, Sect 1, Ch 5, Para 14.

The unexplained descent by the ATR72 crew.

AIRPROX REPORT NO 151/03

Date/Time: 23 Sep 0946
Position: 5236N 0348W (2nm NE of Machynlleth)
Airspace: FIR/UKDLFS (Class: G)
Reporting Ac Reported Ac
Type: B206 JetRanger Hawk pair
Operator: Civ Comm HQ PTC
Alt/FL: 600ft ↓250ft
 QNH (1017mb) (msd)
Weather VMC CLBC VMC CLBC
Visibility: 30nm 10km +
Reported Separation:
 nil H/200ft V 100ft H/300ft V
Recorded Separation:
 NR

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

THE B206 JETRANGER PILOT reports his helicopter has a silver & black livery and the landing lamp and 2 HISLs were on whilst conducting a pipeline inspection flight. A PINS notification had been given to Low Flying Booking Cell and they were listening out on 122.5MHz, but were not in receipt of an ATS. A squawk of A0036 was selected with Mode C and a Skywatch CWS is fitted.

Flying some 1000ft below cloud at an altitude of 600ft RPS (1017mb), with an in-flight visibility of 30nm, heading 060° 2nm NE of Machynlleth at 100kt, the Skywatch CWS gave a traffic warning showing 2 contacts astern. His observer then spotted a single Hawk 1nm away at 5 o'clock and said to descend, which he did. A black Hawk jet then passed directly above on a similar heading 200ft - from TCAS - above his helicopter, followed 4sec later by a second Hawk in a similar position. He assessed the risk as "high" if he had not descended.

THE HAWK PILOT, a QFI flying with a passenger, reports he was leading a pair of black Hawk jets in 'fighting wing' formation on a low-level sortie in LFA7, with his No2 behind and to starboard; the 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 not in receipt of an ATS.

Approaching the SW'ly corner of the Machynlleth loop at 420kt, turning left through 120° 'into sun' to intercept the 'Machynlleth Loop' flow system descending to 250ft msd, a helicopter was spotted by his wingman who called a 'tally' - low - in the left 10 o'clock, about 1½nm away. He immediately spotted the JetRanger about ½nm away to port and below them, as it had been masked from him below the ridgeline in a valley. To breakaway would have put him dangerously close to his wingman's flightpath, so to avoid the helicopter he reduced the rate both of the L turn and descent to increase the separation distance from the helicopter, subsequently passing 100ft astern and 300ft above the JetRanger. At no stage, in his view, was there a risk of a collision and he stressed that if he had taken more drastic action it would have compromised his wingman's position.

THE HAWK PILOT'S STATION comments that the Hawk pair was engaged on a low-level staff continuation training (SCT) sortie with an experienced QFI in the lead ac. The No 2 ac was flown by another QFI and a trainee pilot was occupying the rear seat. The pilot of the No 2 Hawk did well to spot the helicopter in time to pass an accurate position to the formation leader who then took appropriate

AIRPROX REPORT No 151/03

avoiding action by reducing his rate of descent and turn rate. A more aggressive manoeuvre would have jeopardised the safety distance between the two jets.

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

UKAB Note (2): NOTAM Y5196/03, promulgated this PINS flight and notified a warning that the helicopter might be encountered within gas areas E1 to E10 inclusive, which were notified active, amongst others, 07-1100UTC on this day.

HQ PTC comments that this seems to be a fairly routine encounter in the LFS, which was handled appropriately by the pilots concerned. The PINS NOTAM promulgated the warning through the whole of Wales and that information was of strictly limited utility. The TCAS on the helicopter yet again proved its worth at low-level.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It was apparent to the members that the JetRanger pilot was complying with the advice contained in the AIC and operating in the recommended altitude band of 500-700ft, but unfortunately because of the terrain this did not appear to have 'sky lined' the ac. The invaluable Skywatch had proved its worth once more and members speculated that it would have been extremely difficult for the helicopter crew to spot the jets any earlier without it, as the two faster jets approached rapidly from abaft the beam. Members concluded that the JetRanger pilot's prompt avoiding action descent was certainly a wise move and there was clearly little more he could do in the circumstances. Unfortunately, the Hawk pilots did not have the benefit of TCAS technology to assist their lookout scan. The JetRanger was probably just below the ridgeline, which had kept its presence masked from the Hawk leader and it was not until the alert wingman had spotted the conflict and promptly warned the leading QFI, that positive action could be taken to avoid the helicopter. Having spotted the conflict, the lead pilot's avoidance solution was to ease off on both the rate of L turn and the descent rate, which allowed the pair to pass 100ft astern of the helicopter and some 300ft above it he reported. This was slightly at variance with the helicopter pilot's assessment of 200ft but it suggested to some members that this incident was basically a conflict resolved by both the JetRanger pilot's descent and the Hawk leader's avoiding action. However, the Station's appraisal of the encounter had contended that a more aggressive manoeuvre would have jeopardised the safety distance between the two Hawks, flying in 'fighting wing'. Members, however, felt there was more to it than that. Experienced fast-jet pilot members explained that 'fighting wing' formation is designed to give the No2 reasonable 'freedom of manoeuvre' whilst following his leader in a fluid tactical scenario; here the wingman, another QFI, should have been able to adjust his own separation from the No1 at will to ensure that he did not restrict his leader's manoeuvrability. If the wingman had constrained the leader's options for manoeuvre, the wingman should have 'broken away', or the leader could have told him to do so. Considering all the factors that led to the outcome, convinced the Board that this Airprox had resulted because the Hawk leader had flown the formation sufficiently close to cause concern to the JetRanger pilot.

Some members contended that if the formation was restricted in its ability to manoeuvre, this had elevated the level of the inherent risk whereby safety was not assured. Others were of the opinion that the performance of the nimble Hawk ac should have allowed the Hawk leader to choose his separation at will. It was clear that the inherent agility of the jet gave the Hawk pilots a great advantage and a wider range of avoiding action options than the helicopter pilot. Although it would have been advantageous to accord the helicopter greater separation, the Hawk pilots had indeed spotted the JetRanger and taken action to pass astern, albeit by a small margin but they were also 200-300ft above the helicopter at the

closest point. Weighing all these aspects carefully the prevailing view, by a small majority, was that no risk of a collision had existed in the circumstances reported here.

PART C: ASSESSMENT OF CAUSE AND RISK

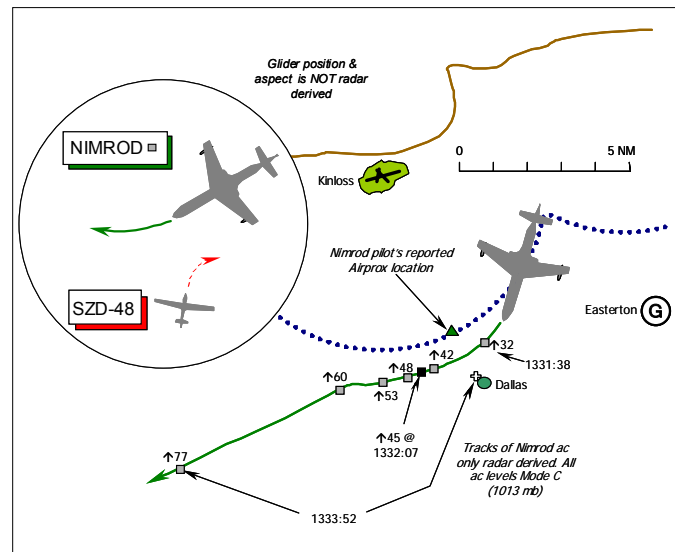
Cause: The Hawk leader flew sufficiently close to cause concern to the JetRanger pilot.

Degree of Risk: C.

AIRPROX REPORT No 152/03

AIRPROX REPORT NO 152/03

Date/Time: 27 Sep 1332 (Saturday)
Position: 5733N 0333W (6nm S of Kinloss - elev: 22ft)
Airspace: Scottish FIR (Class: G)
Reporting Ac Reported Ac
Type: Nimrod MR2 Standard Jantar
Operator: HQ STC Civ Pte
Alt/FL: FL45 3000ft (QFE)
Weather VMC CLBL VMC
Visibility: >10km >30nm
Reported Separation:
400yd 400yd
Recorded Separation:
NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE NIMROD MR2 PILOT reports his ac has a hemp camouflage scheme and the HISL was on, whilst climbing in VMC shortly after departure from RW08 at Kinloss. They were flying some 1000ft clear of cloud, in between layers, with an in-flight visibility of more than 10km and in receipt of a RAS from Lossiemouth DEPARTURES on 258-85MHz and squawking the assigned code of A4604 with Mode C.

Approaching a position 5nm SSE of Kinloss heading 250°, climbing through FL45 at 250kt the port beam lookout spotted a white glider with a red nose at 9 o'clock about 500yd away that was apparently breaking R and descending. He also initiated a break to the R based on this report, but this was soon stopped and their intended track resumed when the port beam lookout advised there was no longer any conflict. None of the flight deck crew saw the glider at all and they were entirely reliant on the good work from the lookout who estimated that the minimum separation was about 400yd. He assessed the risk as "high" adding that the glider did not appear on the ac's radar displays nor were they given any warning by DEPARTURES.

THE STANDARD JANTAR SZD-48 GLIDER PILOT reports his glider is coloured white with a red nose and red wingtips. He had launched from Easterton aerodrome and was soaring about 1nm N of the village of Dallas (some 5nm WSW of Easterton) at 45kt in sunny weather with about 4/8 of Cu and no wind. While circling R in a thermal at 3000–3500ft QFE, some 500ft below cloud with an in flight visibility of more than 30nm, he spotted a Nimrod ac about 1–2nm to the N that he presumed had taken off from Kinloss and was climbing on a southerly heading. He watched it pass by some 400yd to the W as it climbed and turned to the S; there was no need to take avoiding action but he could have done so if necessary and in his view there was no danger of a collision. He was flying in "unrestricted" airspace and added that he is well accustomed to observing and if necessary avoiding such ac.

UKAB Note (1): The UK AIP at ENR 5-5-1-2, promulgates that Easterton Glider launching site is active during daylight hours for winch and aerotow launches which may attain a height of 2000ft above the site elevation of 361ft amsl.

MIL ATC OPS reports that the Nimrod departed from Kinloss on a BRAVO SID to avoid both Easterton Glider Site (5nm S of Lossiemouth) and Kinloss Motor Glider traffic. Lossiemouth DEPARTURES (DEPS) identified the ac at 1331:38, "...in the climb FL240, Radar Advisory on passing 2200ft...". The

crew was released under their own navigation and reported turning R onto about 250°. At 1333:18, the Nimrod crew advised DEPS that "...approximately 3 miles back at FL 45....we just came very close to a glider, approximately 400 yards" to which DEPS advised ".....nothing seen on radar". The Nimrod was transferred to Scottish CONTROL at 1340:34, however the crew came back onto the frequency at 1340:36, advising that although it had "...nothing to do with you because it didn't show up on radar...we think it's wise to file an Airprox" whereupon details of the encounter were passed. The controller reports that a primary contact did appear on his display for one sweep and then faded from the screen but this was after the Nimrod had flown past the area.

Knowing that the Easterton Glider site was active DEPS initial reaction was to release the Nimrod on an ALPHA SID which would take it to the N and W of Kinloss. Conflicting Kinloss Motor Glider traffic prevented this however, so he revised his plan to a Bravo South SID. This is the only SID that turns departing ac R off RW08 and although Easterton was notified as active the profile also routes traffic to the W of the gliding site. With known conflicting traffic to the N and no traffic observed to the S this was the logical action to take. Lossiemouth radar performance is known to be poor, with high levels of 'clutter' and it is likely that the glider was not detected - the radar performance at Lossiemouth is being addressed as a matter of priority. However the problem of detecting, identifying and providing traffic information and avoiding action against such ac is likely to remain as ever. Even with higher performance radars, gliders can be difficult to spot. Here, as the glider was not displayed to DEPS no advisory avoiding action could be proffered under the RAS provided.

[UKAB Note (2): The Aberdeen radar recording does not show this Airprox, as only the Nimrod is evident as it transits the vicinity of the Airprox location. The Nimrod climbs into radar cover at 1331:38, passing FL32 Mode C (1013mb). The reporting Nimrod pilot reports the Airprox location as less than 5nm SSE of Kinloss but as he climbed through FL45 at 1332; it appears that his ac tracked slightly further S and the incident might have occurred some 6nm S of the aerodrome as the jet climbed through FL45 at 1332:07. However a slight R turn is just evident on the recording about 20sec later as the ac passed FL53 Mode C, which may be indicative of the R break initiated by the Nimrod pilot. However, the glider pilot's position report would correlate broadly with that reported by the Nimrod pilot. The only indication of any other traffic in the vicinity is a solitary primary response in the vicinity of Dallas at 1333:52, almost 2min after the reported timing when the Nimrod is through FL77, well to the SW.]

THE NIMROD MR2 PILOT'S STATION comments that Nimrod crews are very aware of the need to maintain a good lookout at all times. Gliders are often difficult to see because their colour merges into the background. In this instance it is encouraging to note how well the Nimrod crew worked together to spot and avoid the glider. Nimrod crews are well aware of the possibility of encountering gliders and light ac during departures and recoveries and are regularly reminded of the need to maintain good visual and radar watches.

HQ STC comments that the crewman who spotted the glider is commended on his prompt action. His actions, and the willingness of the Captain to manoeuvre his ac on this call, is testament to some excellent CRM. Fortunately, both parties saw each other and therefore there was little chance for collision. That said, under the Rules of the Air, the Nimrod crew had the responsibility to avoid the glider - who has the better ergonomics for lookout and is more manoeuvrable!

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 briefed that this was a fairly normal VMC thermalling situation for the Glider pilot and it was apparent from his report that he was aware of the possibility of encountering these large military

AIRPROX REPORT No 152/03

jets in the vicinity of Kinloss. Some wondered if the Jantar pilot could have given Lossiemouth [the ATSU that provides radar/approach services to Kinloss aerodrome] a call on RT and apprised them of his general position and intentions. However, it was recognised that some glider's radios have limited channelisation and the glider pilot may not have been able to communicate with ATC. Furthermore, this information would only be correct when transmitted and the controller was already aware that gliders might be encountered and had taken this into account in the Nimrod's departure routing. One view expressed was that it would probably still have been preferable to route the Nimrod on a Alpha SID – thus further away from the glider site – while taking positive steps to separate it from the 'known' motor glider that was at least in communication with ATC. This might have reduced the potential for encountering a glider – a view put forward with the benefit of hindsight. The Board was cognisant of the difficulties of detecting gliders on radar as mentioned in the Mil ATC Ops report and noted that the controller could not have known at the time that the Jantar was in the way, only that gliders could be encountered anywhere in the FIR. A GA member explained that the much heralded light-weight transponder - seen by many to be the universal remedy for detecting gliders on radar - is still some way off, but there was clearly nothing more that DEPS could have done to forestall this encounter. Furthermore, it was mentioned that aerotows can on occasions fly much higher than promulgated for specific training or aerobatics.

Thus in the see and avoid environment of Class G airspace the crux of this Airprox was lookout. The glider pilot had detected the large four-engined ac first, some 2nm away and was content that he could continue with his thermalling R turn whilst the Nimrod passed 400yd away to the west, always able to manoeuvre safely out of the jet's way if need be. Conversely, pilot members recognised that the Nimrod crew would have great difficulty locating the small white glider with its very small 'head-on' cross-sectional area as it turned toward them. The Board endorsed the Command's view and commended the crew for their good teamwork. That said, and not in any way wishing to detract from the good work of the lookout here, members observed that if the Nimrod lookout had first seen the glider at 9 o'clock as reported, then it was already passing abaft the beam when spotted. It had also been reported that the lookout thought the glider was breaking R in avoidance, but that had subsequently been shown not to be the case. Here both pilots had either detected, or been made aware of, the presence of each other's ac which passed about 400yd away. With this in mind, the Board concluded that this Airprox had resulted from a conflict in Class G airspace. Furthermore, although the horizontal separation could not be confirmed independently from the radar recording, both pilots' reports agreed exactly that they had passed each other 400yd apart. This convinced the members that no risk of a collision had existed in the circumstances reported.

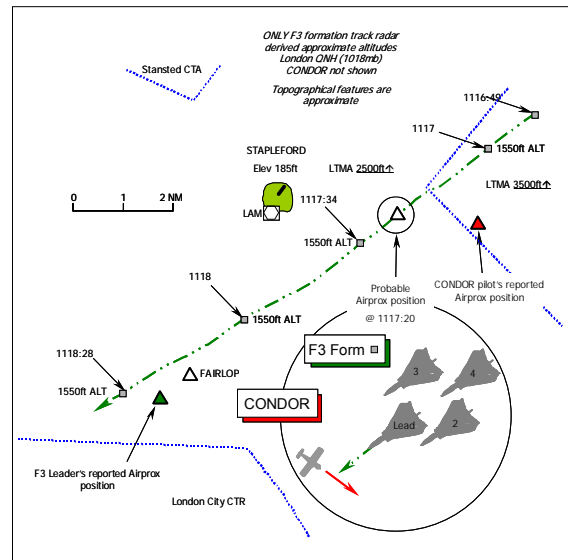
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in the FIR.

Degree of Risk: C.

AIRPROX REPORT NO 154/03

Date/Time: 21 Sep 1117 (Sunday)
Position: 5138 N 0014E (3nm E of Stapleford - elev 185ft)
Airspace: London FIR (Class: G)
Reporting Ac Reported Ac
Type: Tornado F3 Condor
Operator: HQ STC Civ Pte
Alt/FL: 1500ft 1400ft
 (QNH 1018mb) (QNH 1018mb)
Weather NK HAZE VMC Nil cloud
Visibility: 8km 30km+
Reported Separation:
 100ft V, nil H 100ft V, 300m H
Recorded Separation:
 NR

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

THE TORNADO F3 PILOT reports he was leading a formation of 4 Tornado F3s tasked to execute a flypast over Westminster Abbey, Central London, to commemorate the 63rd anniversary of the Battle of Britain. An Airspace Co-ordination Notice (ACN) #03-09-0112 was published on 9 Sep 03 advising of the activity and a NOTAM promulgated the route from a hold at Southwold to a position abeam Fairlop, overhead Westminster Abbey then outbound from the CTR via Wormwood Scrubs and Stanmore. The F3 formation was receiving an RIS from THAMES RADAR on 128-025MHz, who advised that the area around Stapleford appeared very busy with circuit traffic. Approaching Fairlop heading 234°(M) at 360kt, the F3 formation was moving into a close box formation at 1500ft London QNH (1018mb), when THAMES RADAR advised them of traffic [probably in the Stapleford Cct] slightly right of their planned track. All elements within the formation quickly gained a visual on the reported traffic, which was assessed as no conflict. Shortly thereafter, the No2 F3 - in close formation on the left hand side - became aware of a light ac in a L turn at about 1-2 o'clock – 500yd away and 100ft below the formation on a collision course. The No 2 did not have sufficient time to warn the formation of a possible collision risk before the conflicting ac passed 100ft directly beneath the formation from R – L into their 8 o'clock. The No 4 - in line astern and slightly below the lead - had a fleeting glimpse of the light ac as it passed beneath his ac - a low wing loader, yellow in appearance with dark markings on the wing and a bubble type canopy. No avoiding action was taken – the sighting was too late - and the formation continued onward for the flypast location without further incident.

THE ROLLASON D62B CONDOR PILOT reports his aeroplane has a bright yellow colour scheme with blue trim; SSR is not fitted. He was flying from Old Warden to Rochester an extremely busy route surrounded by various uncoordinated ATSUs, which he flies approximately 30 times a year. On this particular day he was equipped only with a hand held ICOM radio (its range is only about 5nm) but he was maintaining a listening watch on appropriate frequencies – ESSEX RADAR & Stapleford – although not in receipt of an ATS. He was navigating by reference to map/compass/watch, assisted by a hand held GPS, along a straight line track of about 150°(M), but deviating at times to afford increased separation from CAS and known choke points. Flying in level cruise at an altitude of 1400ft London QNH (which he had obtained from the LONDON VOLMET) at 90kt, approaching a position 2nm NW of Brentwood heading 150°(M), he first spotted the low Tornado jets initially at 9 o'clock about 1000m away and 100ft slightly above his ac. The relative bearing was changing “fast” and there was little time to react so no avoiding action could be taken before the tight formation of 4 grey jets passed about 100ft above

AIRPROX REPORT No 154/03

his aeroplane and 300m astern. After the Tornados had passed astern he turned his ac to try and maintain visual contact and check for further possible conflicts, before he flew onward to Rochester. The Freephone for 'Royal Flights' had been checked on the day but there was no mention of any activity; he mentioned the encounter to the duty AFISO at Rochester who was not aware of any formation flight. Very surprised to see such a tight and unmanoeuvrable formation in "open" airspace at an altitude where fast jets are not normally found, he added that the area also lacked any worthwhile primary radar cover with the possible exception of Southend. Although he noted the position, altitude and time on his flight log, he had not initiated a report himself as no avoiding action was taken by any of the pilots involved. He opined that it was an uncomfortably close encounter but assessed there was "no" actual risk of collision, but it was debatable whether the Tornado formation had any worthwhile manoeuvring capability, adding, "*sadly this was just another day in 'open' airspace*".

[UKAB Note (1): In a subsequent telephone conversation with UKAB staff the Rollason Condor pilot advised that he had departed from Rochester to Old Warden on the preceeding Saturday and had also intended to return that day. Unfortunately, he was unavoidably detained and thus returned to Rochester this Sunday. He explained that there are no aeronautical briefing facilities available at Old Warden so he was unable to obtain access to the requisite NOTAMs before his flight. He was also concerned at the speed of this formation through this airspace.]

[UKAB Note (2): This Airprox is not shown on recorded radar. Only the Tornados formation is shown tracking southwest bound beneath the London TMA at a constant 1400ft Mode C (1013mb) - equating to 1550ft London QNH (1018mb). The Rollason D62B Condor is not shown at the time of the Airprox at all on any of the NATS Ltd radar sources. Though the respective pilots' reports agree broadly on the relative geometry of this encounter, the Condor pilot reports the Airprox occurred some 2nm NW of Brentwood, whereas the F3 leader reports it occurred at 5135N 0005E – in the vicinity of Fairlop. The THAMES RADAR RT transcript records the timing of the traffic information given about another ac and sighted by the formation just before the Airprox as occurring at 1117:10. This suggested that the Airprox occurred at about 1117:20, before the formation passed abeam Stapleford and closer to the Condor pilot's reported track; here the base of the London TMA is 2500ft ALT.]

[UKAB Note (3): The flypast and associated formation routeing was the subject of a NOTAM H6108/03 issued by AUS in addition to the published ACN, which had been agreed between AUS, the organiser and the airspace controlling authorities involved to accommodate this unusual aerial activity. The narrative text within the NOTAM, delineated the formation's routeing with timings via SOUTHWOLD - overhead FAIRLOP at 1118 – to on top WESTMINSTER ABBEY at 1120, thence exiting the CTR. The NOTAM promulgated that "*all airspace users are requested to avoid the route by at least 2nm either side of track*". However, this narrative request was edited out from the UK Daily Navigation Warning Summary (UKDNWS) entry and users would have to refer to the NOTAM itself to be aware of this request. Nonetheless, the NOTAM & UKDNWS (that was issued at 1600UTC on the preceding Saturday) could have been accessed by a civil pilot either through an aerodrome briefing facility, on request by fax from AIS, through the Internet or by telephone request to AIS on 0208 7453450. The "Freephone" (0500 354802) referred to by the Condor pilot will only provide information about the temporary establishment of CAS and temporary restricted airspace, it will not provide a comprehensive summary of other aviation warnings. Furthermore, MAISO advises that the UKDNWS has now been withdrawn in favour of the 'one button' brief available on the NATS AIS website.]

ATSI reports that the formation contacted THAMES RADAR at 1112 and was placed under 'a limited radar information service due to poor radar performance'. Traffic information was passed twice before the reported Airprox. On the second occasion, information was passed about opposite direction traffic in the Stapleford area. However, this is not believed to be the other ac involved in the Airprox, the respective radar returns did not merge and the unknown was not tracking in the direction subsequently reported by the Condor pilot. Whereas the H23 radar shows no other returns in the area at the time, there is an intermittent primary return, tracking SE, showing on the H10 radar, which may well have been the D62 concerned. In the event, no comments were made on RTF at the time. In view of the fact that

the frequency was not busy and traffic information had been passed to the formation, just prior to the Airprox, there is no reason to believe that the unknown ac concerned in the Airprox was visible on the radar display, otherwise appropriate action would presumably have been taken. In any case, the RIS was limited due radar performance.

THE TORNADO F3 PILOT'S STATION comments that such occurrences are frequent enough to cause concern for the safe operation of such unusual, albeit not irregular, events. It would therefore be prudent to exploit the sound relationship that now exists between military and civil airspace planners following the excellent work achieved on MDAs, to develop a more robust system of notification. In particular, this should extend to a method of confirmation that all airspace users/airfield operators that are likely to be affected have received, acknowledged and understood the implications of airspace notification. Light ac are difficult to detect - either by radar (ground based or airborne), or by the naked eye. The surest method therefore to avoid any future such occurrences must be in the education of all aviators as to the nature of flight, and manoeuvre constraints, associated with such NOTAMs.

HQ STC comments that mil fast jet flights inside the Thames Valley Avoidance Area (TVAA) require special authorisation with the route, timings and weather minima being subject to close constraints. The NOTAM that was issued reflected this and, given the lack of manoeuvrability of a close 'box' formation of Tornados, it was necessary to warn other air users in this congested piece of airspace. It is disappointing to see that other air users and airfields were unaware of this NOTAM which had been written to prevent such an occurrence. Whilst, the Condor pilot assessed that the formation passed some 300m behind (the formation would have been in excess of 100ft across), the left hand Tornado Crew would have felt uncomfortable with the encounter with little chance to successfully manoeuvre away. Given the reported late pick up ranges by all involved it is considered that they missed each other more by luck than judgment.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board was cognisant that the Tornado formation leader did not receive a warning from Thames RADAR about the Rollason Condor, which ATSI had explained was probably not evident at all on the controller's display at the time. Thus one of the fundamental aspects here was 'lookout' in the airspace below the LTMA, where a significant number of ac are artificially compressed into the see and avoid environment of the limited 'Open FIR' remaining. Limited room to manoeuvre can be doubly problematic for an unwieldy formation – hence the NOTAM and extensive co-ordination that had been effected for that part of the route outside CAS to enable this flight to take place with reasonable safety in the FIR. However, the existence of a NOTAM did not give the jet crews exclusive use of that part of the FIR encompassed by their route, rather it was a warning to other aviators. The STC member added that the Nos 2 and 3 would have been primarily responsible for lookout as they maintained position on the lead ac, whose crew was steering the formation accurately to maintain their notified route and their promulgated timing overhead Westminster Abbey. This meant the workload on each element of the formation was raised considerably and all remained unaware of the light ac until it was spotted briefly by No2. Even then the pilot did not have an opportunity to pass a warning to the other crews before the Condor had passed, so although seen momentarily, no avoiding action could be taken in the time available. This was therefore, effectively, a non-sighting by the F3 formation, which members agreed was one part of the cause.

The Condor pilot had departed from Old Warden unaware of the F3 formation's promulgated routing and timings. He said he was unable to access the requisite aeronautical information before take-off from this small grass aerodrome, which had no briefing facilities, a point that was reinforced by a CAT pilot

AIRPROX REPORT No 154/03

member. However, a GA pilot member disagreed; he thought that there were several options open to the Condor pilot to obtain the available aeronautical information as had been advised by AIS. There was a duty of care placed on all aviators to ensure that they were aware of the latest information available, such as promulgated here before this evolution, so that they could ensure that their flights could be conducted with safety - a point which the Board endorsed. Whilst the NOTAM had requested all airspace users to avoid the route by at least 2nm either side of track within the promulgated timings, the Board recognised that this was not mandatory nor was it in the form of Temporary Restricted Airspace – a TRA. The latter aspect explained why it was not contained on the recorded message from the Freephone mentioned by the Rollason pilot in his report - but as he was unaware of the NOTAM he could not comply with the request. Though the Condor pilot had 'right of way' under the 'Rules of the Air', these 'rules' can only work if mutual visual acquisition exists, which in this incident it did not. Members agreed with the Condor pilot's own assertion about the F3 formation's manoeuvring capability. Moreover, they doubted the wisdom of expecting the formation to manoeuvre out of the way of the nimble Rollason, but it was evident that its pilot had seen the formation of 4 large jets - he reports 1000m away - somewhat earlier than the No2 F3 pilot had, but with little time to react no avoiding action could be taken before the formation passed by. In the Board's view, this amounted to a late sighting on his part, which it was agreed unanimously formed the other part of the cause.

Turning to the inherent risk, the absence of Mode C from the Condor did not permit the height separation to be independently ascertained. Nevertheless, both pilot's reports agreed that the vertical separation was 100ft as the F3 formation overflew the Rollason Condor, though the latter's pilot perceived that the jets also passed 300m away rather than directly overhead. It was unfortunate that the radar recording had not shown the occurrence, as this aspect could not be verified either. However, the light ac pilot was probably better placed to assess this distance as his ac would have disappeared from the jet pilots' view very fast as they passed over. While the ac were never going to collide, at these heights, coupled with the proximity of the light ac to the unwieldy formation of jets, the Board agreed unanimously that the safety of the ac involved had certainly been compromised.

The HQ STC member noted that the NOTAM issued here had not included an important piece of information - that the formation would be unable to comply with the normal 'Rules of the Air'. He perceived this to be a significant omission and undertook to ensure that this would be included in future warnings for similar flights.

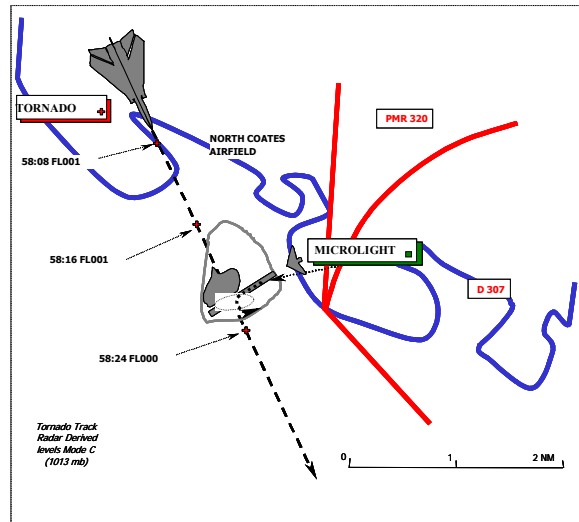
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Effectively, a non-sighting by the F3 formation and a late sighting by the Condor pilot

Degree of Risk: B.

AIRPROX REPORT NO 155/03

Date/Time: 24 Sep 1659 (Wednesday)
Position: 5332N 0005E (N Coates Lincs)
Airspace: UKDLFS LFA 11 (Class: G)
Reporting Ac Reported Ac
Type: Microlight Tornado GR4
Operator: Civ Pte HQ STC
Alt/FL: 300ft 400ft
(QFE) (QFE)
Weather VMC CAVOK VMC CAVOK
Visibility: 5nm >20km
Reported Separation:
100ft H 0 V NR
Recorded Separation:
NR

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

THE MICROLIGHT PILOT reports taking off from North Coates airfield at about 1715BST flying a yellow and white ac with no lights, SSR or radio on a local sortie with a passenger (and owner of the microlight) in the back seat. After a short flight they decided to return to the airfield for some touch and go approaches from a 500ft amsl circuit. Immediately after his second touch and go, climbing out and banking to the left at between 200-300ft, heading 180° at about 50kt, he was overflowed by a grey Tornado ac about 100ft above him and on a similar heading. The ac was travelling S and it appeared to be climbing and banking to the left as if he had just seen the microlight. As soon as it had passed it descended to its original altitude which was about the same as his, and continued to the S. The airfield is on the coast near Donna Nook bombing range so they were accustomed to being overflowed. Since they were aware that night flying takes place on Tuesday and Thursday they stay on the ground however, this was a Wednesday evening and when he arrived at the airfield at about 1645 BST he was informed that Donna Nook had been contacted and it was confirmed that the Range was closed.

He reported the incident the next day to Donna Nook.

THE TORNADO GR4 PILOT reports flying a grey Tornado GR4 ac with HISSL selected on, squawking 7002C and trying to contact Donna Nook Range. They authorised, briefed and planned for a singleton low level sortie as part of the Sqn's Standardisation Visit with the ac captain, a visiting QFI, in the rear seat.

The sortie was originally planned to fly low level and join Donna Nook and Wainfleet AWRs but prior to briefing for the sortie, the detail at Donna Nook was deleted, because the range would be closed. Once airborne, when they approached the area of Donna Nook they passed down the W edge of the Range heading S to avoid both North Coates and the Range Danger Area, at 500kt and 400ft agl.

They were unaware of the presence of microlights in the vicinity of North Coates and were flying in Class G airspace under the see & avoid principle; unfortunately in this case they did not see the microlight in question.

UKAB Note (1): HQ STC confirmed Donna Nook Range was closed at the time of the incident. In the UKAIP (Mil) D307 is published as being active SFC 20000ALT 0900-1630 Mon-Thu, 0900-1500 Fri also

AIRPROX REPORT No 155/03

1630-2200 Tue and Thu. Therefore on the day and at the time of the incident D307 was not active, the UKDLFS however, was open until 1830Z and the Tornado involved was correctly booked into LFA 11.

UKAB Note (2): The recording of Claxby Radar shows the Tornado tracking from NW to SE at about 400kt. The track passes just to the W of the centre of the runway. The QNH at the time of the incident was just under 1030; therefore the Tornado descended slightly from 500ft to 400ft amsl/agl as it flew over the airfield.

UKAB Note (3): North Coates is annotated on the UK Mil Low Flying chart as a Minor Airfield, not as a Microlight site. As such it does not attract a mandatory avoidance area only a warning that ac operate from the location and that clearance should be maintained from ac in the traffic pattern.

THE TORNADO PILOT'S STATION FSO COMMENTS that he had spoken with both crew members regarding the incident and neither pilot saw the microlight in question. Both were aware of the proximity of the minor airfield at North Coates and were confident that they had not flown over the area as depicted on the UK Low Flying Chart. Both expressed surprise that the airfield was not annotated as a Microlight Site and that it is not promulgated as such in the Military Aeronautical Planning Document Vol 3 Part 1. They had deviated from their planned route, and had done so with due consideration to the proximity of Donna Nook AWR and North Coates.

Personnel at Donna Nook contacted the Station shortly after the incident and explained the situation but did not mention that an Airprox had been filed. The SFSO was sympathetic to the plight of the microlight pilot and undertook to inform all Marham Tornado Squadrons of the microlight activity on North Coates and that they should be particularly observant in that area.

HQ STC comments that North Coates is annotated on low flying maps as a minor airstrip. However even minor airstrips should be treated with caution, as there is always the possibility of an ac taking off; therefore even if it is not mandatory, they should be avoided or overflown at a height comfortably above circuit height.

It is unfortunate that the Tornado crew did not see the microlight, especially as they elected to overfly an airfield which they should have been aware of, not only from the map but also from experience of the Range and they should have exercised extra vigilance in that congested area.

North Coates Airfield is used by both microlight and Group A light ac of the local flying club. The criteria used to attract a microlight 'Major Site' status, and thereby a 1nm/2000ft mandatory avoidance area, is a site used 7 days per week throughout the year (UK Mil AIP). North Coates is far from this definition; it could however, have been annotated with an 'M' in addition to the Minor Airfield symbol and MFAC Sqn have been made aware that less regular microlight activity takes place. In any case, we understand that this year the Microlight School moved to Sandtoft Airfield, therefore they see no need for further action, bearing in mind the standing agreement under which Donna Nook provide an information service when the Range is active.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

There was some discussion regarding the intensity of Microlight activity at North Coates, however specialist advisors assured the Board that it was not high enough to warrant any mandatory avoidance area. That said, the minor airfield is marked on both civil and military VFR maps and good airmanship would dictate that pilots should avoid the circuit area. Members were therefore disappointed to note that a crew conducting an annual standardisation check, in an attempt to avoid a closed (i.e. it did not exist

at the time) Danger Area, directly over flew the middle of a small but active airfield, the position of which they should have been aware and which is easy to acquire visually. Had the checking pilot in the rear seat ensured that their navigation equipment was accurate or navigated accurately using visual references they would have missed the airfield, as they believed that they had, and the incident would not have occurred.

Microlights are notoriously difficult to see particularly in a head or tail on aspect but their pilots have a normal obligation to maintain a good lookout. However, in this instance the Tornado approached from behind and the pilot was therefore not in a position to see its approach. There was an equal obligation on the part of the Tornado pilot to see and avoid other users. Although he had the opportunity to see the microlight that was just left of his 12 o'clock, he did not for whatever reason and was therefore not able to take action to avoid it. This had caused the Airprox. Fortunately however, the Tornado had climbed slightly to cross the coast and was displaced laterally by a small margin.

The Board considered this to be a serious incident and there was much discussion as to whether there had been an actual risk of the 2 ac colliding; however, a majority of Members considered that there had not on the basis of the geometry involved. Had the Tornado approached from more directly astern, the outcome might have been different; but, based on what did take place, Members took the view that there had been a serious compromise to the safety of both ac.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A non-sighting by the Tornado crew.

Degree of Risk: B.

AIRPROX REPORT No 156/03

AIRPROX REPORT NO 156/03

Date/Time: 29 Aug 0910

Position: 5335N 0149W (7nm NE of DENBY)

Airspace: UAR/MRSA (Class: B)

Reporter: LACC LAKES SECTOR

First Ac Second Ac

Type: A320 Sea Harrier

Operator: CAT HQ STC

Alt/FL: FL320 FL300↓

Weather: NR NR

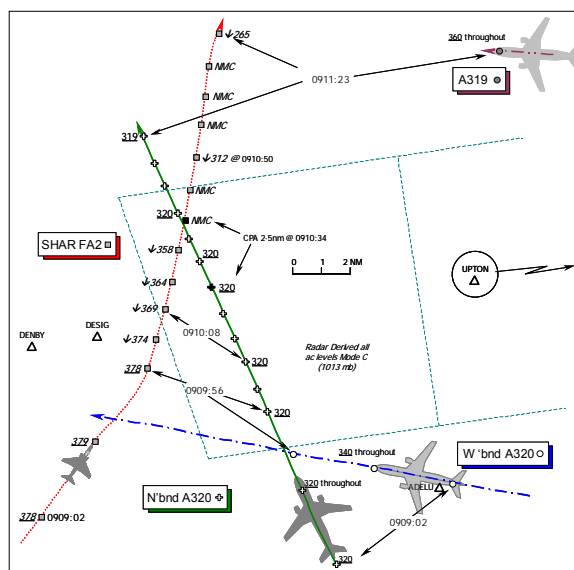
Visibility: NR NR

Reported Separation:

Not seen Not seen

Recorded Separation:

2.5nm H/V NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE LAKES SECTOR 3 PLANNER CONTROLLER (S3 PLAN) reports that LAKES Sectors 3 & 4 were in the process of being split when he agreed that MIL NW could transit a 'military crosser' – the SHAR - across the Sector at FL380. He passed this co-ordination to Sector 4, which was then split off, leaving him as the Sector 3 PLANNER. A short while later the S4 TACTICAL controller asked if co-ordination had been agreed with MIL NW regarding their SHAR and the northbound A320 at FL320 which it had not. The SHAR had no Mode C at the time.

THE LAKES SECTOR 4 PLANNER CONTROLLER (S4 PLAN) reports that he was aware of the SHAR at FL380 (RVSM exempt) flying NE through S4. He was told by S3 PLAN that the SHAR required descent in the POL area. Significant other GAT under control of S4 was another westbound A320 [not the subject northbound A320] on UL26 level at FL340 and an A319 at FL360 on UL46, also westbound. He was told that the SHAR would descend rapidly before crossing beneath the A319, but after consulting with S4 TAC, they were not entirely confident about the co-ordination. After passing above the westbound A320, the SHAR started to descend and its Mode C readout disappeared; MIL NW confirmed it had passed FL350. He then asked if MIL NW had co-ordinated with the lower sector; they said they would co-ordinate with Sector 29 at MACC, but he reiterated that he meant S3. He walked over to S3 to see if they had any conflicting traffic and noticed the SHAR still without Mode C very close to the northbound subject A320 at FL320; co-ordination had not been effected. After further consultation with the military controllers he was told they were "taking 5".

[UKAB Note (1): The LAKES sectors are split vertically, the boundary being at FL335. As the subject northbound A320 was climbing to its cruising level of FL320 it would remain under a RCS with S3 TAC within S3's airspace.]

THE LAKES SECTOR 4 TACTICAL CONTROLLER (S4 TAC) reports that S4 had been split from S3 for about 5 min. The PLANNER had previously issued a cleared flight path (CFP) to MIL NW for the SHAR to cross at FL380, when S4 PLAN indicated that MIL NW wanted to descend their SHAR below the A319 cruising at FL360, but they also had to miss another westbound A320 at FL340. He verbally indicated that he was not happy with the co-ordination, because this all relied on a timely very high rate of descent from the SHAR. MIL NW then turned the SHAR N and he turned the A319 left to ensure separation. The SHAR descended at a very high rate but after clearing the A319 the Mode C

disappeared from the SHAR's Track Data Block (TDB – SSR label). The next time it reappeared the SHAR was in S3's airspace indicating FL291 having descended through the level of the northbound A320 who was at FL320.

THE LAKES SECTOR 3 TACTICAL CONTROLLER (S3 TAC) reports that Sectors 3 and 4 had just been 'split' a few minutes before. The only indication that the SHAR had entered his airspace was when S4 enquired if any co-ordination had taken place with MIL NW about the A320 at FL320; they had not. When alerted to the presence of the SHAR, he looked but there was no Mode C showing on his background TDB for the military ac, until moments later it appeared beneath the A320; the crew did not report seeing the military jet.

THE SWANWICK (MIL) NORTH WEST CONTROLLER (MIL NW) reports that he was screening a trainee who was controlling a SHAR on a Cleared Flight Path CFP at FL380 routeing to Linton. Co-ordination was agreed with the then S4 Planner to take 2000ft separation above a westbound A320 cruising at FL340 and then once clear of that traffic to expedite descent below FL350 against further westbound civil traffic – an A319 - at FL360. The SHAR was then turned onto a heading of 010° and descended to effect the agreed coordination. Once clear of the westbound A320 at FL340 the SHAR pilot was instructed to expedite descent to FL300 and then further descent to FL250. At this point S4 pointed out the proximity of the SHAR to the northbound subject A320.

THE A320 PILOT reports that he was unaware of anything untoward at the time of the Airprox and so when queried some time later was unable to contribute a report.

THE SEA HARRIER (SHAR) FA2 PILOT reports that his ac has a light grey camouflage scheme and that HISLs are not fitted. TCAS is not fitted. He was in receipt of a RCS from Swanwick (Mil) whilst descending inbound to Linton-on-Ouse from FL380 – FL300. He did not recall any avoiding action being proffered by the controller and there was no suggestion at the time of an Airprox occurring.

LACC reports that this erosion of separation between the subject A320 that was level at FL320 northbound for Edinburgh and the SHAR, under the control of MIL NW, occurred at 0910, 7nm NE of DENBY. MIL NW climbed the SHAR to FL380 and a CFP was obtained from the LAKES S4 PLAN. However, at that point the LAKES sectors were in the process of being split - the co-ordination was agreed with the controller who subsequently became the S3 PLAN and was passed on to the incoming S4 PLAN.

At 0909 the MIL NW trainee requested a descent for the SHAR from the S4 PLAN. The westbound A320 at FL340 and the westbound A319 at FL360 were pointed out and it was agreed that the SHAR could descend to FL360 on top of the westbound A320 at FL340 and then an expedited descent given against the westbound A319. S4 TAC indicated that he was not entirely happy with the co-ordination and decided to turn the A319 left to ensure separation. During the co-ordination discussion with the S4 PLAN no mention was made of the northbound A320, indeed none was required as it was not in his sector and it is the responsibility of the MIL NW controller to co-ordinate with individual sectors. The Swanwick (Mil) report suggests that the MIL NW team did not appreciate the fact that S4 and S3 had split. Nonetheless, if MIL NW thought that the LAKES SECTOR was still banded together, co-ordination should have been requested against the northbound A320 anyway. However, the MIL NW team was not aware of the presence of the northbound A320 because the hooked TDB of the SHAR completely obscured the reduced background TDB of the northbound A320.

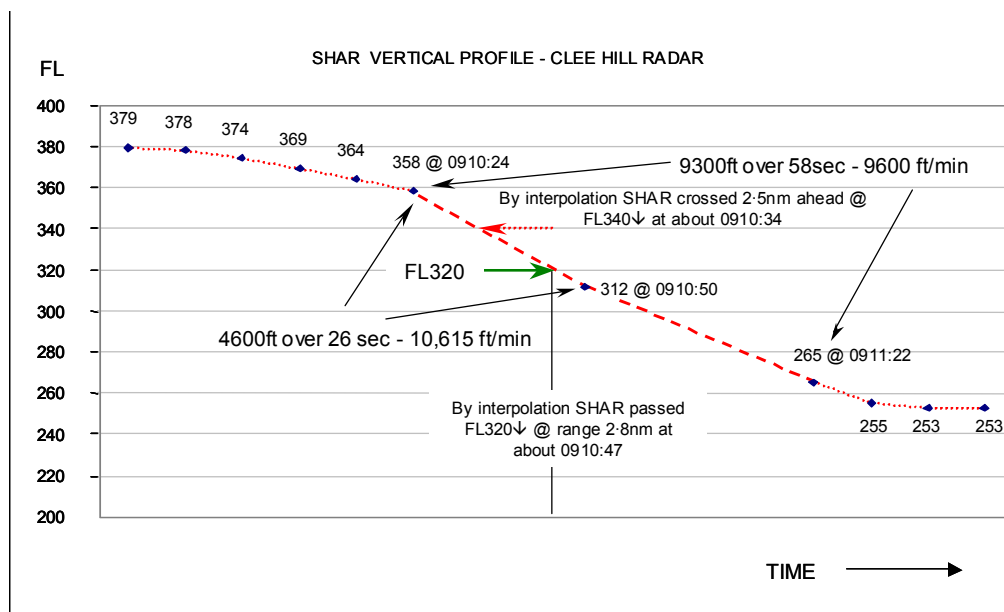
Shortly after this co-ordination the SHAR was given a L turn for positioning towards Linton-on-Ouse. Fortuitously, this turn increased the separation against the northbound A320. At 0910:16, the SHAR having passed clear of the westbound A320, was cleared to descend to FL300 and expedited through FL350. Almost immediately thereafter, the pilot was given further descent clearance to FL200, the MIL NW controller "taking 5". At this point line 2 of the northbound A320's TDB was just visible showing FL320.

AIRPROX REPORT No 156/03

S4 PLAN reports that the SHAR's Mode C 'dropped out' and the MIL NW controller, who is seated just behind the LAKES Sector, confirmed that it was out of FL350. S4 PLAN asked if MIL NW had co-ordinated it with the lower sector – S3 - and was told that they would co-ordinate with Sector 29 at MACC. When S4 PLAN clarified that he was actually referring to S3, the response from MIL NW was along the lines of "taking 5".

The S3 TAC states that the only indication of the SHAR being in his airspace was the enquiry from the S4 PLAN. On being alerted to this he saw a background track with no Mode C. On the next sweep the Mode C return showed FL290. The A320 crew did not comment and the flight was transferred to ScACC as normal.

By interpolation the descent profile of the SHAR shows it was descending at about 10,000ft/min with the rate as it crossed through the A320's level of about 11000ft/min. SMF records the horizontal separation as 2.8nm ahead when the SHAR descended through the level of the northbound A320 at FL320. [UKAB Note (2): By interpolation, this was at about 0910:47 if the SHAR maintained a continuous rate of descent of 11000ft/min. The minimum horizontal separation from the radar recording was about 2.5nm when the SHAR crossed ahead of the A320 at 0910:34, descending through about FL340 by interpolation.] Enquiries with the A320 operator confirmed that the TCAS equipment fitted does not capture rates of descent in excess of 10000ft/min and apparently the SHAR was not displayed on the subject A320's TCAS nor did the flight crew see it.



MIL NW was not aware of the loss of separation until receiving a complaint from the LAKES S3 team about 1min after the event. It is apparent that MIL NW cleared the SHAR pilot to descend through the level of the northbound A320, unaware of its presence. Contributory to this are the design features of the Swanwick Man Machine Interface (MMI) and the practice by Swanwick (Mil) controllers to deselect Line 1 of the SSR label on background TDBs. A software change is planned for implementation in early 2004 that will include enhancements to TDB presentation.

Initially filed as an ATC occurrence report and originally classified as an incident, one of the controllers concerned re-evaluated the seriousness of the event and following a full debrief has agreed that the incident should be upgraded to an Airprox. Furthermore, following further consideration of the circumstances, the following recommendation was made:

It is recommended that NATS requests that the CAA consider the imposition of a maximum rate of vertical change in Class A airspace and within Upper ATS routes in Class B airspace. The maximum

rate of vertical change to be fixed within the limitations of conflict alert parameters in both airborne and ground based systems. Any such regulation not to apply to an aircraft commander carrying out any necessary action in an emergency situation.

ATSI concurs with the LACC report & recommendation contained therein.

MIL ATC OPS reports that the SHAR was working the Swanwick (Mil) North West Controller (MIL NW) climbing to its assigned level of FL380 and placed the flight under a RCS as it entered CAS heading towards POLE HILL. At 0904 the SHAR pilot reported level at FL380, whereupon some routine administration was completed in preparation for its approach into Linton-on-Ouse. The pilot was given 'own navigation' to Linton and called steady "*..radar heading 035°*" at 0905. Although the SHAR pilot advised MIL NW that he was ready for descent he was instructed at 0909, to "*...maintain at the moment traffic right 2 o'clock 12miles crossing right left co-ordinated FL 340*" [the westbound A320] and the pilot reported visual contact a short time later. Thereafter, a turn and descent instruction "*...left heading 010 descend report level FL360*" was issued followed at 0910, with an instruction to "*...expedite descent FL300 expedite through FL350*" which was acknowledged and complied with by the pilot who reported passing FL350 shortly thereafter. Just before 0911 a further descent instruction to FL250 was given and the pilot called levelling at exactly 0911.

Analysis of the Cleve Hill Radar recording shows the SHAR commencing its descent at 0910 whilst the northbound A320 is 4nm SE. At 0910:08, the SHAR is shown passing FL369 Mode C 3.5nm NW of the A320. The 2 ac converge and 8sec later they are 3nm apart - the SHAR passing FL364; at 0910:24 they are 2.8nm apart as the SHAR passes FL358. At the closest point at 0910:34, the SHAR is crossing through the A320's 12 o'clock at 2.5nm but NMC is evident. Thereafter the SHAR starts to pull away from the A320 and at 0910:50, indicated below the A320's level at FL 312.

The Unit reports that MIL NW was manned by a trainee and mentor who were working throughout this incident with Line 1 [ac ident] of the SSR 'Background' Track Data Blocks (TDB) deselected. As the SHAR was an RVSM exempt ac and conflicting traffic had been observed, MIL NW co-ordinated with S4 PLAN to transit at FL380, consequently the SHAR pilot was instructed to climb and route towards POL when he established communications on the frequency. Sometime before the incident occurred the subject A320 was observed in the TNT vicinity and the trainee 'dragged' this aircraft's TDB to the South West Outer position for TDB presentation and left it 'unhooked'. This meant that the relatively small amount of label information was significantly divorced from the ac symbol (about 12nm on the range selected), with a 'strut' connecting the two that ended on the North East corner of the TDB, but also some way from the TDB border. Subsequently, the SHAR's TDB was also dragged to the South Outer position below the ac symbol, and left in the 'hooked' state, in order to complete the interactions required in updating the Electronic Flight Strip (EFS) as the track progressed across the sector. When 'hooked', these TDBs overlay and obscure the data - though not the ac symbols - of overlapping 'unhooked' TDBs. MIL NW was obliged to maintain a large range setting because of the wide split between other ac under control. Thus at 0908:48, undetected by either trainee or mentor, the TDBs of the SHAR and the northbound A320 merged in a position presented on the Main Display some 10-15nm South West of the A320's ac symbol - with the SHAR TDB masking the presence of the A320's TDB.

Linton-on-Ouse is situated less than 12nm from the boundary of CAS, consequently MIL NW needed to descend the SHAR as soon as possible to facilitate a handover to Linton ATC. The ATCRU reports that co-ordination was agreed between MIL NW and the S4 PLAN to descend the SHAR to FL360 over the top of other GAT at FL340 [the westbound A320] then expedite descent below FL350 against the westbound A319 to the N that was at FL360. No mention was made that the subject A320 was no longer under the control of S4 but now working S3. Shortly afterwards, the SHAR pilot was given a positioning turn onto a heading 010° for Linton and instructed to descend to FL360. In accordance with the plan, when clear of the other GAT at FL340 MIL NW instructed the SHAR pilot to descend to FL300 and to expedite through FL350, apparently taking 5nm horizontal separation on the A319 at FL 360. However,

AIRPROX REPORT No 156/03

no reference was made to the ac symbol of the northbound A320 that was about 4nm SE of the SHAR, the airliner's TDB now being displayed to the W of the SHAR TDB due to its earlier manipulation.

Given the performance of the SHAR, MIL NW actually only needed to co-ordinate the subject northbound A320. The SHAR passed 5.9nm ahead of the other GAT at FL340 and over 7nm ahead of and 10,500 ft below the A319 at FL360. Moreover, with the SHAR pilot able to descend 6,800ft in a distance of a mere 7.7nm, descent could have been delayed until standard horizontal separation of 5nm from the subject A320 had been achieved. However, this all depended on both the trainee and mentor of MIL NW seeing and recognizing that the A320 was a confliction, which plainly they did not. Whilst an inherent design feature of the LACC MMI may have significantly contributed to this omission, it is readily apparent that MIL NW descended the SHAR into confliction with the A320 and appropriate action has been taken by the Unit. The circumstances of this Airprox have been promulgated within the Unit to remind controllers that background TDB data can be obscured by overlapping hooked TDBs and of the need to scan closely for target symbols when 'taking 5'. Additionally, the chain of events have been reviewed thoroughly and local orders have been amended to make explicit reference to the need to manipulate SSR labels appropriately on the MMI.

THE SEA HARRIER FA2 PILOT'S STATION comments that the SHAR pilot executed the instructions of the MIL NW controller, obviously attempting to use the performance of the ac to his advantage and to provide minimum disruption to GAT. It is unfortunate that the MIL NW controller was evidently unaware of the A320's presence. With reference to the recommendation regarding limiting maximum rates of descent (ROD) or climb (ROC) in CAS, we believe there could be unforeseen difficulties with implementation as some military a/c may not accurately display ROD/ROC above 6000ft/min despite the fact they are capable of 20,000ft/min. Rather than restricting operations as a result of an isolated incident, would it not be more valuable investigating improvements in the "safety systems" designed to highlight conflictions such that they can detect high ROD/ROC?

HQ STC comments that ATC lessons have already been correctly identified. The descent rate selected by the SHAR pilot was in-keeping with the "expedite descent" instruction and was in no way excessive for a high performance ac. It is also noteworthy that both the safety-critical TCAS and STCA system did not give protection from high-performance ac performing within their normal operating envelope. It is recommended that users be alerted to this inadequacy. Furthermore, it would be advisable to investigate whether both these systems could be modified to cope with a wider range of climb/descent rates. Current and future military aircraft such as Typhoon and JSF have been designed to operate at higher altitudes with better performance and the under-performance of TCAS/STCA could provide the opportunity of a further recurrence.

The recommendation from LACC/ATSI would have to be staffed very carefully. Whilst it is agreed that a military aircraft in Class 'A' and 'B' airspace could comply to a climb/descent restriction during normal transit operations (our C-17 fleet currently comply with a similar request during normal air-route ops). It would be hugely restrictive to expect all military aircraft, especially those training in the upper-air (presently FL245 but possibly soon to be FL195) under a co-ordinated airspace agreement, to comply with such restrictions. Furthermore, the requirement to train in the upper-air is likely to increase in the future with the introduction of Typhoon and JSF; equipment that HM Government have spent a lot of money procuring. Therefore, we would suggest that the CAA engage with the MOD with the above in mind before carefully considering any such restriction.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It was explained to the members that this occurrence was not originally filed as an Airprox; controllers on the LAKES Sector had not initially realised the true nature of this event and it was not until radar recordings were studied in detail later that events came to light. Consequently, 5 weeks elapsed before an Airprox was raised and the pilots involved, understandably, had scant recollection of the event after that period of time. Whilst it might have been difficult here, the Board encouraged pilots and controllers alike to ensure that each was informed as soon as practicable if formal reporting action was being taken. This enabled all concerned to note their understanding of events whilst still fresh in their own minds and facilitated the assembly of a comprehensive picture of what had transpired. This clearly placed an onus on Supervisory staff at the units involved to ensure that this was done.

Here, the SHAR pilot and northbound A320 crew were apparently oblivious to the entire event and neither saw each other's ac when the SHAR descended ahead of the airliner, or if they did, they did not consider it was noteworthy. Although informed of the impending descent of the jet through the co-ordination effected against their westbound traffic, none of the LAKES Sector 4 controllers were aware that the MIL NW team would descend the SHAR into S3's airspace below in close proximity to the northbound A320; there was no communication with the controllers running Sector 3 beforehand about the SHAR's descent. Moreover S4 had no responsibility to inform their S3 colleagues. It seemed to some that MIL NW was not aware that the LAKES Sector airspace had been split into its component sectors, for if they had, in all probability MIL NW would have initiated co-ordination with S3 PLAN assuming they realised that the A320 was a confliction – but this assumption was unlikely because of the obscurity caused by the SHAR's TDB. When MIL NW co-ordinated out the two westbound tracks they perceived there was no other traffic to affect the SHAR's descent below them. Some contended that perhaps they expected S4 PLAN to highlight any other GAT that might conflict and had not been taken into account, but if they did they were mistaken. Nevertheless, a civilian controller member was concerned at the uncertainty here – it was essential that LJAO controllers were aware of the exact Sector structure ALL the time to ensure efficient operations, otherwise situations as related here can occur. The Board was briefed that although the Supervisor at Swanwick (Mil) was aware of the 'split', MIL NW did not appear to share such knowledge, which would clearly have affected their actions with respect to co-ordination. A ScACC controller mentioned that when sectors are 'split' this information is shown on the Centre's Support Information and Retrieval System (SIRS); apparently this is not done at Swanwick, but controller members thought it a sound practice worthy of emulation at LACC.

Evidently Mil NW remained unaware of the confliction even though both mentor and trainee should have been aware of its presence some time earlier when the TDB of the northbound Airbus was manipulated. But, unlike their civilian colleagues, MIL NW did not have an electronic or paper Flight Strip Display to rely on showing all GAT in the sector, which might potentially conflict with their traffic; conflict detection in the first instance relied entirely on observing GAT on the radar display. The Board was shown how the traffic would have been presented to the controllers and it was explained how the trainee had moved the SHAR TDB such that it had obscured the northbound A320's abbreviated TDB thereby masking the danger below. The NATS advisor added that improvements had since been made to the MMI, which was encouraging, but the salient message to controllers using this MMI here was – do not leave the TDB 'hooked'. Although the conflicting A320 was displayed to the controllers, neither the mentor nor trainee manning MIL NW was aware of the airliner when they instructed the SHAR pilot to descend. Furthermore, during the descent, the Mode C of the SHAR was not shown continuously as it descended through the level of the subject A320. This complicated the assessment of minimum vertical separation but it was evident from the comprehensive analysis conducted by LACC and MIL ATC Ops and from the SMF data provided and by interpolation of the recorded Clee Hill radar data that the SHAR had already crossed ahead and was opening 2.8nm away when the fighter descended through the airliner's level. Nonetheless, MIL NW was responsible for ensuring that standard separation of 5nm was provided between these two ac in Class B CAS under these circumstances. That they did not do so was the fundamental cause of the Airprox and the members agreed unanimously that this Airprox had resulted because MIL NW descended the SHAR through the level of the A320, unaware of its presence at the time.

AIRPROX REPORT No 156/03

Turning to the risk inherent within this occurrence, even the electronic safety 'barriers' of TCAS and STCA had been breached and the question posed was how could separation have been eroded without anyone knowing it at the time? The concise report from LACC had endeavoured to show that Mode C cannot cope with a ROD or ROC of more than 10000ft/min; similarly TCAS has the same limitation it would appear. By interpolation, over three sweeps of the Clee Hill SSR interrogator the SHAR's Mode C indicated a rate of descent between 9600 - 10615ft/min, indicative of a loss of intervening Mode C data because of the high ROD. However, when taken over a longer period, the SMF plot provided to the Board suggested that the jet's descent from FL380 down to FL250 was accomplished over about 1.7minutes – giving a ROD (although predictive in nature) more of the order of 7647ft/min overall, and so less than the parameters highlighted by LACC. But it was clear that the SHAR's Mode C had not been displayed throughout a significant portion of its descent, when the pilot acted "expeditiously", in compliance with the request from the controller. As STCA and TCAS were entirely dependant on Mode C data it was understandable how these essential safety barriers might be breached and the Board recognised the concern behind the LACC recommendation. However, some members reasoned that as the SHAR was passing at least 2.5nm clear ahead of the A320 at a faster speed, still in the order of 2000ft above it, TCAS might not have perceived that the jet would breach the airliner's 'safety bubble' at all. Whilst the geometry of the situation had ensured that the subject ac would not actually collide, the Board recognised that none of those who were capable of breaking the chain of events related here, was aware of what had occurred until after the event. This situation was highly unsatisfactory in CAS and led the Board to conclude unanimously that the safety of the two ac involved here had been compromised to a significant extent.

Whilst the LACC recommendation had highlighted the Centre's concerns from a controller's perspective, it seemed to the Board that there were several other variables to take account of not just the jet's rate of descent, which the controller himself had asked the pilot to expedite. Those familiar with the SHAR FA2 said that the jet's Mode C indications were dependant on the information fed from the ac's Air Data computer and it might be that the SHAR's Mode C altitude reporting was not being given accurate information by the Air Data computer at these rates. Indeed, the SHAR pilot's station pointed out that few military ac could display to a pilot a ROD above 6000ft/min on cockpit instrumentation despite a capability to achieve 20,000ft/min - a point reinforced by the STC fast-jet pilot member. The issues at the heart of the LACC recommendation were discussed at length and the members agreed that the points expressed by the Station and HQ STC were equally relevant. Furthermore, the application of high ROD/ROC where appropriate is an essential tool used by LJAO to best advantage when controlling high performance ac. In the Board's view, this was a very complex topic that had wide implications. It seemed on the one hand sensible to limit the ROD/ROC in Class A & B as suggested by LACC and endorsed by ATSI, but on the other hand it was clear that current service ac instrumentation would not allow the pilot to select a ROD/ROC within specified parameters above 6000ft/min so how would a pilot know if any limit was exceeded? The existing unsatisfactory situation did not ensure that controllers/pilots were always alerted to potentially dangerous situations. Worse, this Airprox had shown that the considerable capabilities of TCAS, seen by some to be the all embracing 'backstop', might be defeated by ac flying at a high ROC/ROD. The Board agreed that this topic should be reviewed in a joint military/civil forum and the introduction of high performance ac like Typhoon suggested it should be done as a matter of urgency. Consequently, the Board was minded to recommend that the CAA and the MOD reviews jointly, the safety issues associated with ac that climb or descend in controlled airspace at such high rates that their Mode C indication cannot be interpreted by TCAS or ground based ATC equipment, thereby inhibiting any warning to pilots and/or controllers.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: MIL NW descended the SHAR through the level of the A320, unaware of its presence.

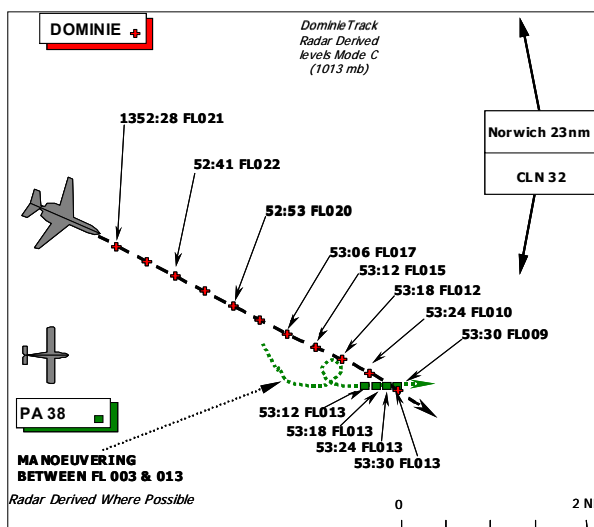
Degree of Risk: B.

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

AIRPROX REPORT No 157/03

AIRPROX REPORT NO 157/03

Date/Time: 30 Sep 1353
Position: 5222N 00122 E (23nm S Norwich)
Airspace: London FIR (Class: G)
Reporting Ac Reported Ac
Type: Dominie T1 PA38
Operator: HQ PTC Civ Club
Alt/FL: 720ft 1000ft
(RPS 1005 mb) (RPS)
Weather VMC HAZE VMC
Visibility: 10nm >10km
Reported Separation:
100ft H 150ft V NR
Recorded Separation:
Contacts Overlap H 400ft V



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE DOMINIE T1 PILOT reports flying a singleton training sortie from RAF Cranwell in the UKDLFS in a black and white ac with strobes selected on and squawking 7001C and not in communication with any agency. While heading 125° out of sun at 210kt, after a practice diversion to RAF Coltishall they were descending back to low level in East Anglia, and while passing through 720ft, a light low-wing single engined ac first became visible slightly above them and just off his nose at 0.6nm, as the background colouring changed from white haze/cloud to blue. When he saw the ac he initiated a right turn and assessed the risk of collision as being low. Since the ac was tail-on and white in colour, the combination of aspect, ac colour and background colour made it very difficult to see even though 3 crewmembers were actively looking out to the front.

THE PA38 PILOT reports flying a white ac with red stripes, with his anti-collision lights selected on squawking 7000C and in receipt of a FIS from Norwich. He was on a training flight and had descended to 1000ft (RPS). He had advised Norwich Approach of his intentions and was keeping a lookout especially for a Stearman that was owned and operated in that area. He could not recall anything about this incident and, until contacted by AIS Mil, he was unaware of the Airprox but he understood from them that he was turning left when the Dominie passed behind him. He could not recall being told by ATC of any other ac but did recall asking his passenger "was that an aeroplane" as he could not see it; however, a short time later he saw a fast Dominie ac at very low level, heading SE but he was nowhere near them and was heading away from them so he did not consider it to be a factor.

THE DOMINIE STATION comments that once again this Airprox highlights the difficulties in observing light ac with poor conspicuity markings against similarly coloured backdrops. It further highlights the importance of good lookout and appropriate avoiding action being initiated in a timely manner.

HQ PTC comments that this seems to be a gratifying instance where good lookout overcame an unhelpful aspect and lack of contrasting background. Given that these circumstances will necessarily mean a late "spot", the Dominie pilot appears to have avoided the PA38 by the best margin that he could.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members noted that from the Dominie cockpit the PA38 would have been below the horizon and therefore would have blended in against the background fields. Its tail-on aspect would have reduced further the likelihood of acquiring it visually, even with 3 crewmembers looking out. Although the PA38 pilot was not in a position to see the other ac as it approached from his rear, the avoiding action taken by the Dominie pilot, although late, was sufficient to remove any risk of collision.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A late sighting of the PA38 by the Dominie crew.

Degree of Risk: C.

AIRPROX REPORT No 159/03

AIRPROX REPORT NO 159/03

Date/Time: 9 Oct 1238

Position: 5240N 0009E (23nm NNW of Mildenhall - elev 33ft)

Airspace: London FIR (Class: G)

Reporting Ac Reported Ac

Type: KC135R x2 Harrier

Operator: Foreign Mil HQ STC

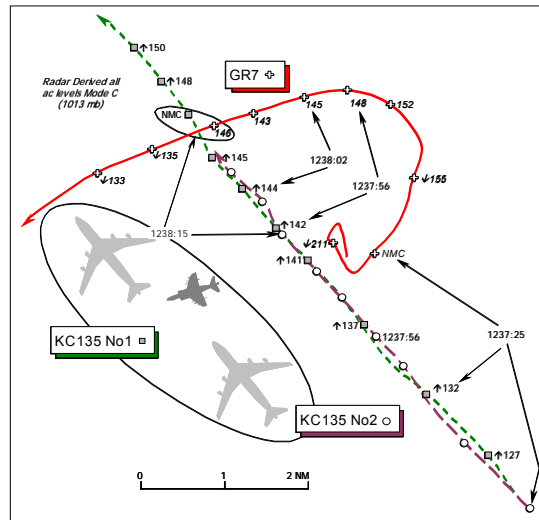
Alt/FL: FL170↑ FL120

Weather VMC NR VMC CAVOK

Visibility: NR >10km

Reported Separation:
<500ft V 3nm H/1-2000ft V

Recorded Separation:
GR7 v No1 KC135: 100ft V/0.34nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE KC 135R PILOT reports his ac has a grey camouflage scheme but the HISL was on whilst leading a pair of tankers outbound from Mildenhall under IFR. They were in receipt of a RIS from LONDON MILITARY and squawking the assigned code with Mode C; TCAS is fitted. Whilst heading 327° at 360kt on the MILDENHALL 7 standard departure climbing through FL170 he thought, approaching NORD [327R MLD 23d], he received a traffic call about an ac at 1-2 o'clock. They began to look for the traffic and spotted a jet 2nm away at 2 o'clock. Just as he reported the traffic in sight, the other ac – a Harrier - passed <500ft directly beneath inducing an RA on TCAS – [although he did not specify which]. The Harrier maintained its heading and then climbed rapidly as he continued on towards Coningsby.

THE HARRIER GR7 PILOT, a solo OCU student, reports that his ac has an air defence grey camouflage scheme but the HISL was on whilst carrying out general handling in the vicinity of Wisbech in 'CAVOK' conditions. He was manoeuvring in a 'block' between FL50 – 240 and in receipt of a 'Limited' RIS from LONDON MILITARY - due to high traffic density - squawking the assigned code with Mode C, but neither TCAS nor any other form of CWS is fitted.

Flying level at FL120 he thought, whilst heading E he commenced a L turn back onto W. Passing through about 330° in the L turn he spotted one KC135 about 3nm to the N 1000-2000ft above him and climbing northbound. When he rolled out on W at 300kt, he spotted another KC135 in his 8-9 o'clock 3-4 nm to the S, climbing on a northerly heading, initially 2000ft below but climbing up through his level. A westerly heading was maintained until the other ac were clear and he then continued with some aerobatics. He estimated that at the closest point, the nearest KC135 passed 3nm away in his 7 o'clock some 1000-2000ft below him and the risk was "nil", adding frankly, that if he had flown significantly closer than his own estimate then he was unaware of it, however, this would have surprised him because of the ac geometry.

MIL ATC OPS reports that the 2ac KC135 formation [C/S 1 & 2] was in the process of being handed over from Lakenheath DEPARTURES (LKN DEPS) to LATCC (Mil) Controller 15 (CON 15) at 1235:17, "11 miles W of Lakenheath, [squawking] 6153...out of FL70 for block...[FL] 210 to 220...radar information service". CON 15 identified the lead KC135 and after some initial confusion clarified the position of the No2 as in the No1's, "...6 o'clock, 2 miles, non-squawking...". CON 15 accepted the handover at 1236 and the contact frequency was passed. Concurrently, at 1235:26, the Harrier GR7 was being handed over from Cottesmore Departures (COT DEPS) to another controller at LATCC (Mil) - Controller 13 (CON 13), a

trainee screened by a mentor. The ac was handed over 19nm E of Wittering tracking SE, squawking A6132 to operate in a block FL50 - FL240 under a RIS for general handling. At 1236:02, the Harrier pilot checked in with CON 13 at FL145, who responded that the ac was identified in the block FL50 to FL240 under RIS. Immediately thereafter, CON 13 was called on the landline for a handover on another unrelated civil ac on VHF requesting a RAS. No traffic information was passed to the GR7 pilot about the KC135s. The only relevant transmission in this period was shortly after 1238, when CON 13 transmitted to the Harrier pilot *"...limited traffic information from all around due to high t... traffic, an area of high traffic density"*. Meanwhile, at 1237:06, the KC135 formation checked in with CON 15, who identified the formation and placed it under a RIS climbing to FL220, whereupon the leading KC135 pilot confirmed it was for *"the block 210 to 220.."*. CON 15 acknowledged this transmission and at 1237:27, immediately called traffic – the Harrier – at *"12 o'clock, 3 miles, manoeuvring, no height information...now right 1 o'clock, 1 mile, manoeuvring, indicating FL 150"*. The KC135 crew responded to this at 1237:56, with *"[C/S] has traffic at 2 o'clock and would think he's descending approximately – 2 miles E, roger, turning into us now and we'll continue our climb"*, which CON 15 acknowledged.

[UKAB Note (1): The Debden Radar recording shows the Harrier manoeuvring with the No1 KC135 converging from the SE followed by the non-squawking No2 KC135 - 2nm in trail. The Harrier is shown in a left hand turn at 1237:25, indicating NMC, moments before traffic information was passed on it by CON15 to the KC135 crew, climbing through FL132. The GR7 turns away from the formation before turning back towards it descending through FL148, as the No1 KC135 climbs through FL142 - some 600ft below it at 1237:56, when the latter's crew reported sighting the Harrier. At 1238:02, minimum recorded vertical separation of 100ft is evident; the lead KC135 passing FL144, 1.32nm SW of the Harrier, which is indicating FL145 just above the leading tanker as the ac continue to converge. Some 200ft of vertical separation is shown at 1238:15, just before the Harrier passes about 0.34nm astern of the leading KC135 and 1.6nm ahead of the No2, the GR7 indicating FL146 but NMC is evident from the No1 tanker at this point. Thereafter the Harrier diverges and descends to the SW as the tanker formation tracks NW.]

The KC135 formation departed Mildenhall to the NW with the intention of routing to AARA 7. After a protracted handover from LKN DEPS, the crew took a full minute before calling CON 15. Thereafter, CON 15 swiftly identified the formation in the climb to FL220. The pilot clarified that he wanted the formation to operate in the block from FL210 - 220, which CON 15 acknowledged and immediately called the conflicting Harrier, *"... 12 o'clock, 3 miles, manoeuvring, no height information"*. The lead KC135 crew replied that they were looking for the ac and CON 15 correctly updated the traffic information *"...now right 1 o'clock, 1 mile, manoeuvring, indicating FL150"*. The formation acquired the Harrier visually and at 1237:56, reported the GR7 was *"...at 2 o'clock ...descending...2 miles E...turning into us now and we'll continue our climb"* as the descending Harrier passed less than ½nm, behind the lead KC135. The Harrier departed Wittering to manoeuvre to the E of Wittering under a RIS in the block FL50 – 200. As soon as CON 13 identified the GR7 and placed it under a RIS, the sector team became involved in the telephone handover of the civil RAS traffic, during which it is believed the controller opened out the displayed radar range to locate the civil ac; it is not known whether the trainee wound it back in again. No RT conversation took place for a minute before CON 13 *"limited traffic information due to high traffic density"* at 1238:10, which the pilot acknowledged and no traffic information was passed at all to the Harrier pilot. CON 15 fulfilled all the requirements of the RIS requested. CON 13 did limit the RIS appropriately and under the rules *"the pilot is wholly responsible for maintaining separation from other aircraft whether or not the controller has passed traffic information"*, furthermore the Harrier pilot reports that he was visual with the KC135 formation. This Airprox report was not received until several days after the event. When the controllers concerned were identified, they only had vague memories of the event and had not completed the relevant incident reports. However, the mentor should have intervened to ensure that his trainee passed traffic information about the formation.

The investigation of this Airprox was hampered because the KC135 pilot neither reported the Airprox on RT nor immediately after landing to the ATCRU, therefore, accurate controller reports could not be completed.

AIRPROX REPORT No 159/03

THE HARRIER GR7 PILOT'S STATION comments that the pilot was operating in Class G airspace under a RIS from LONDON MILITARY in an area of high traffic density. He was aware of the position of the other ac involved and believed that the actions that he took were sufficient to deconflict from both KC135 ac. Within Class G airspace we routinely operate under 'see and avoid', in concert with a RIS, but in this particular case the familiarity of foreign aircrew with UK ATs and procedures might have compounded the issue. The GR7 pilot was fully aware of the close proximity of the other traffic and was in full compliance with the rules for operating in Class G airspace.

HQ 3AF comments that when operating in a formation of 2 aircraft, KC-135s fly in 1-2nm trail with the second aircraft 1000ft below the lead aircraft. The foregoing reports give rise to many points of discussion, viz, whether or not the traffic density justified limitation of service; CON 13, who by doing nothing other than limiting service seemingly absolved himself from any further responsibility; the Harrier pilot acting in accordance with traffic information calls which, seemingly, did not emanate from his controller, CON 13. That said, each aircraft was under a RIS in Class G airspace and each saw the other, either with or without the help of their respective controllers. The Harrier then chose to pass sufficiently close to the KC-135 formation not only trigger a TCAS RA but to cause concern to the formation leader; indeed, the lead KC-135 pilot's assessment of the separation - within 500ft vertically and 2nm horizontally - was greater than the actual separation of 100ft and 0.34nm, which explains why he assessed the risk of collision as medium to high. The dichotomy remains as to what constitutes a common sense missing distance from the perspective of, on the one hand, the leader of a formation of 2 heavily laden tankers to, on the other, the pilot of a highly manoeuvrable fast jet.

HQ STC comments that the Harrier was mistaken with his ranging estimates. He did pass reasonably close to the KC135s and this was close enough to cause concern to the crews. Whilst, he saw the KC135s and manoeuvred his aircraft so that a collision could not have occurred, the Harrier pilot would have been wiser to have given them a larger margin.

The only potential reason for his ranging errors are the physical size of KC135s and the lack of any radar on the Harrier GR7. The reported pilot of the Harrier was an OCU student and due to the experience level of the individual this may have contributed to his ranging error.

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 HQ 3AF advisor commented that these crews were as familiar and experienced with UK airspace and procedures as any average military crew and the GR7 pilot's Station's observations on this point were misguided. It was evident after close examination of this incident that the Harrier pilot was mistaken in believing he had been given traffic information about the KC135 formation under the RIS. On the contrary the trainee and mentor manning CON13 did not spot the conflict at all – possibly as a result of SSR label overlap in what was apparently a dense traffic situation. Some members were critical of the ATS provided to the GR7 pilot here who received no 'heads-up' from ATC whatsoever to help him detect the presence of these two large tanker ac. The pilot himself had requested a RIS whereby traffic information only is given and no separation proffered. Nevertheless, for whatever reason this had not worked as it should, but fortunately the Harrier pilot had spotted the leading KC135 himself (but not the second one) as he turned L through 330°. From the radar recording this would have been just before 1237:56, when the leading Tanker was more than 1000ft below the GR7 and climbing towards it - not already above him as he had thought – or if the No1 KC135 was actually above him when spotted he had seen it much later than he thought. Furthermore, the radar recording had shown that the GR7 then passed about 0.34nm behind the leading KC135 as it climbed through his level, in between the formation ac, some 1.6nm ahead of the No2 at the closest point and even closer than that

reported by the KC135 leader. Here again the GR7 pilot reports seeing the No2 below him in his 8-9 o'clock, but if that was the case it was either after he had passed ahead of the No2 or whilst actually passing through the Tanker's 12 o'clock. It was fortunate that the KC135 crews had been forewarned about the Harrier from the copious traffic information provided by CON15, who the Board agreed had painted a comprehensive picture for the Tankers' crews of what was going on. However, a long discussion ensued about the wisdom of the controller's decision not to allocate a squawk to the No2 tanker. CON15 considered the formation to be 'one unit' although they were 2nm apart and 1000ft apart. Whereas, 'normally' the formation can be considered to be one unit if within 1nm at the same level, the Board was briefed that JSP552 permits controllers to use their own discretion when operating outside CAS and extends these parameters up to 3nm & 1000ft. It was pointed out that no traffic information resulted at all from CON13 regardless of whether the No2 was squawking or not, but some thought the additional SSR data might have improved the No2's conspicuity. Others thought it was unfortunate that with both controllers operating from the same ATCRU and the flight data of each other's tracks available to both that these flights could not have been co-ordinated in some way. This might also have highlighted the presence of the tankers to the CON13 controllers and triggered an early warning to the GR7 pilot. As it was the heavily laden and unwieldy tanker formation would have had difficulty trying to avoid the nimble GR7 - as was dictated by the 'Rules of the Air'. Nevertheless, the confliction did not occur until the GR7 turned about westbound and in the see and avoid environment of Class G airspace fast jet pilot members believed that the GR7 pilot should have detected the other much larger ac sooner than he did. A further point was that if traffic information had been given by ATC about both Tankers, the GR7 pilot may have thought twice about flying between them. However, having turned about and spotting the leading KC135 he then elected to cross behind it at what he believed was an acceptable distance. By the time he saw the second KC135 he elected to maintain the established separation from both, possibly mistaking the actual distances because of the large size of the KC135 as HQ STC had suggested. Clearly the KC135 leader was concerned, as evinced by his own report reinforced by that of HQ 3AF, but also because of the TCAS indications enunciated. The nature of the RA and whether it was followed or not was not clear, but any change of flightpath in compliance with an RA when flying within an unwieldy formation was not a welcome situation. Board members understood the reasons behind the Tanker Leader's concern. Whilst it was unfortunate that the GR7 pilot was not forewarned by CON13, the Board agreed that this Airprox had resulted because the Harrier GR7 pilot flew between the ac in trail formation and close enough to the KC135 leader to cause concern. However, as the tracks crossed behind the leader and the GR7 pilot could have climbed or turned away to afford the KC135s greater separation if need be there was unanimous agreement that no risk of a collision had existed in the circumstances reported.

It was noted that there had been no suggestion that an Airprox was being filed at all, until the KC135 pilot's report was sent via HQ 3AF to AIS (Mil) some 5 days after the event. The Board implored pilots to make clear their intentions to file an Airprox on RT at the time to ensure that ATCOs were made aware of the situation. This sequence ensured that timely data gathering actions would commence, allowing reported pilots and controllers alike the opportunity to compile their submissions promptly whilst events were still fresh in their minds. If then a pilot elected to withdraw the Airprox then nothing was lost.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Harrier GR7 pilot flew between the formation ac and close enough to cause concern to the KC135 leader.

Degree of Risk: C.

AIRPROX REPORT No 160/03

AIRPROX REPORT NO 160/03

Date/Time: 14 Oct 1132

Position: 5136N 0227W (7nm NE Filton)

Airspace: FIR (Class: G)

Reporting Ac Reporting Ac

Type: AS355 PA28

Operator: Civ Comm Civ Trg

Alt/FL: 900ft 700ft ↑

(QNH 1023mb) (QNH)

Weather VMC CLBC VMC

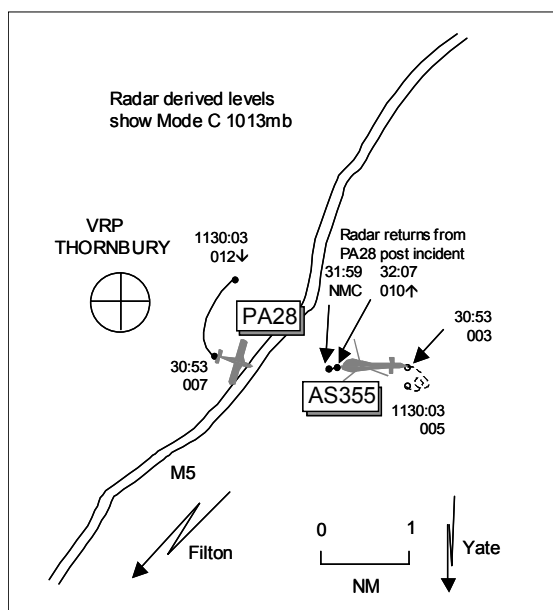
Visibility: >10km >10km

Reported Separation:

NR V 150m H 100ft V 100m H

Recorded Separation:

NR



BOTH PILOTS FILED

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE AS355 PILOT reports flying the last of 4 x 20min local navigation exercises from Filton and in receipt of a FIS from Filton RADAR on 122.72MHz squawking 7017 with Mode C. The visibility was >10km below cloud in VMC and the ac was coloured white/red/blue with nav, anti-collision and strobe lights all switched on. About 2nm E of Thornbury, 30sec after having completed a turn onto heading 270° towards the next and last waypoint at 110kt and 900ft QNH 1023mb (600ft agl), the student in the LH seat shouted “aircraft”, as he, the Capt and PF, caught sight of a PA28, coloured white, <0.25nm ahead at the same height on a reciprocal heading. Immediately he took avoiding action by breaking L and down, to keep visual contact with the ac, which passed 150m to his R without deviating from an easterly heading. He assessed the risk of collision as high. The student was commended by the Capt and the instructor seated in the rear RH seat as this was only his 4th flight and he had been busy cross-checking the route details of the last flight leg. The subject helicopter was a replacement ac, not fitted with TCAS, as the usual one was on long term servicing.

THE PA28 PILOT reports flying a dual local instructional sortie from Filton and in receipt of a FIS from Filton RADAR on 122.72MHz squawking 4260 with Mode C. The visibility was >10km in VMC and the ac was coloured white/blue/red with landing, anti-collision and strobe lights all switched on. He was teaching PFLs and operating exactly in accordance with his ‘booking out’ form. During a go-around heading 080° and climbing through 700ft QNH, he thought, at 65kt in a nose high attitude, he saw a white helicopter pass under his starboard wing, displaced about 100m horizontally and 100ft below but he was unable to confirm the helicopter’s attitude owing to their relative speeds. This was the first time he had seen it, no prior notification had been received about it from ATC and it also appeared that the other pilot had not received TI on his ac’s position. The helicopter pilot reported an Airprox on the RT and he then volunteered his c/s to confirm his involvement. He assessed the risk of collision as high.

THE FILTON APR reports the AS355 pilot reported an Airprox on frequency at 1132Z against a PA28 flying in an opposite direction at 900ft QNH, which was identified as the subject PA28. Both ac had departed Filton on local flights. The AS355 was on its 3rd of 3, he thought, low-level NAVEX sorties to the NE of the aerodrome. The PA28 pilot had booked out for GH in the area of Thornbury and Yate VFR between 500ft to 2500ft, however, the intended levels were not annotated on the fps. The PA28 was limited on departure to climb not above 2000ft QNH, owing to instrument traffic in the OF NDB hold at

3000ft, but was de-restricted when this conflict ceased. At no time did the pilot report descending and neither ac was showing on primary or secondary radar at the time of the Airprox.

UKAB Note (1): Met Office archive data shows the Bristol Filton METAR EGTG 1120Z 08012KT 9000 FEW050 BKN090 14/10 Q1023=

ATSI reports that the PA28 pilot had booked out for local flying in an area to the N and NE of Filton, specifying that he would be operating between 500ft and 2500ft. Although this information was passed to the Tower ATSA, it was not written on the fps. The information may have been useful to the controller, but it could not be regarded as valid and up to date and the responsibility for obtaining and retaining current flight data rested with the individual controller. Examination of the unit's MATS Part 2 shows no requirement for the ATSA to mark the strip with this booking out data.

The PA28 took off at 1114, having been cleared to leave the ATZ VFR to the NE not above 2000ft VFR. The AS355 pilot booked out on the Tower frequency and departed at 1118, on a VFR navigational exercise to the N. Both ac were transferred to the APR's frequency and they were both placed under a FIS. [UKAB Note (2): The PA28 pilot's initial call occurs shortly after 1115:30 with the AS355 pilot calling 4min later]. The APR transmitted to the PA28 pilot, shortly after departure, "*....identified on departure Flight Information Service no level restriction*". As the ac was operating in Class G airspace, this effectively meant that the PA28 could operate at any level and without the need to report changes of level to the controller. The AS355 pilot reported on frequency and was advised the he would be receiving a FIS. No TI was passed to either pilot.

Shortly after 1131:30, the AS355 pilot reported having an Airprox with a Warrior. The PA28 pilot stated on the RT that it had been his ac involved as it was just climbing away from a PFL. Both ac were squawking but the controller reported that neither ac was displayed, as either a primary or secondary radar return, at the time of the Airprox.

The flight data available to the Approach Controller would have shown the potential for these two ac to be in conflict and so, in accordance with the provision of a FIS, the passing of TI would have been prudent. However, there is no clear information to indicate that this would have prevented the Airprox.

UKAB Note (3): Analysis of the Clee Hill radar recording proved inconclusive. At 1130:03 the PA28 is seen 1.3nm E of Thornbury VRP in a L turn passing through heading 240° squawking 4260 indicating FL012 (1500ft QNH 1023mb) descending whilst the AS355 is manoeuvring 2.25nm to its SE squawking 7017 indicating FL005 (800ft QNH). The PA28 continues descending before fading from radar at 1130:53 turning through heading 150° indicating FL007 (1000ft QNH). Meanwhile the AS355 has finished manoeuvring and has rolled out on a westerly heading and also fades simultaneously indicating FL003 (600ft QNH). The Airprox is believed to occur during the ensuing radar fade period as the PA28 is next seen again at 1131:59 tracking 080° showing NMC and then 8sec later at FL010 (1300ft QNH) 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.

Members were clear that this had been an encounter in the FIR where 'see and avoid' prevailed and that neither pilot had elected to ask for an ATS where 'warning of other ac' would have been included. Both pilots had opted for a FIS from Filton, where the passing of TI by the controller was subject to workload and the ATCO could not assume responsibility for its issuance at all times or for its accuracy. It appeared the APR had been surprised with the PA28's flight profile but he had derestricted the flight,

AIRPROX REPORT No 160/03

after it had passed the OF holding traffic, without obtaining current flight data from the pilot. Similarly, the PA28 pilot could have confirmed his details on the frequency when the level of service 'contract' was established, thereby ensuring that all parties were aware of his intentions. As it was, his expectations under a FIS were unrealistic. Pilot members were familiar with the PFL training scenario when the cockpit environs would be busy throughout the exercise. During the go-around from the PFL, the PA28's nose high attitude would have restricted the view forward, although there was always the option to weave in the climb so as to move the ac's nose to clear the way ahead. In this case, the PA28 pilot had only seen the AS355 as it passed 100ft below and 100m to his R, effectively a non-sighting which members agreed had been a part cause of the Airprox. From the helicopter's cockpit the PA28's head-on aspect made it hard to see and the AS335 crew only saw it when it was about 0.25nm ahead at about the same level. This had been a late sighting and was a further part cause of the incident. Fortunately, the prompt robust actions taken by the AS355 pilot, by breaking L and descending while maintaining visual contact with the PA28 as it passed 150m to his R, had removed the actual risk of collision. However, the Board believed this left a situation where the subject ac had passed in close proximity to the extent that safety had not been assured during the encounter.

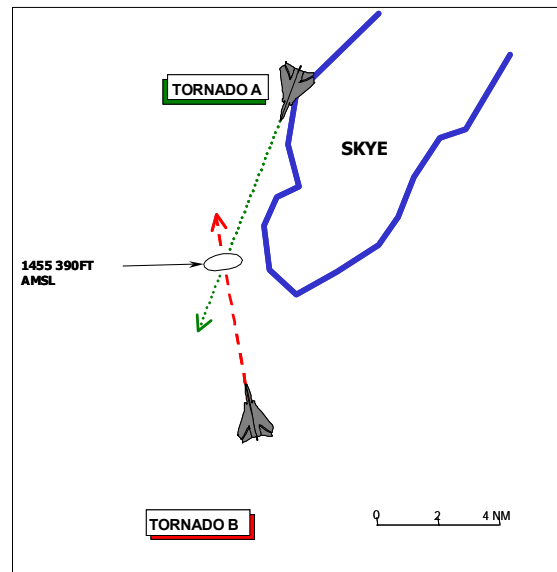
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Effectively a non-sighting by the PA28 pilot and a late sighting by the AS355 crew.

Degree of Risk: B.

AIRPROX REPORT NO 161/03

Date/Time: 15 Oct 1455
Position: 5702N 00604W (5NM S Skye)
Airspace: UKDLFS A 14 (Class: G)
Reporting Ac Reported Ac
Type: Tornado GR4 Tornado GR4
Operator: HQ STC HQ STC
Alt/FL: 390ft 420ft
 (Rad Alt) (Rad Alt)
Weather VMC CAVOK VMC CAVOK
Visibility: 30km >50km
Reported Separation:
 50ft H 0ft V 150ft H 50ft V
Recorded Separation:
 NR

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

THE TORNADO GR4 (A) PILOT reports flying a singleton low level sortie on the W Coast of Scotland in a grey GR4 ac with HISLs selected on and squawking 7001C and listening out on the LFS common frequency. While mid-way through his mission at 1455, heading 207° at 460kt and 390ft asl an Airprox occurred with another similar ac, from the same station just off the S coast of Skye. At the time lookout was made difficult by the low sun position on the section of the route heading S. The Radar Homing and Warning Receiver (RHWR) indicated that another Tornado was approaching from the 11 o'clock sector so both pilot and navigator concentrated their lookout in this area but the other ac was not seen until it was at very close range. The navigator called the other ac just as he started to take avoiding action, manoeuvring the ac to the right aggressively to remain clear of it. Once the risk of collision had passed the sortie was curtailed and the ac returned to base as both the pilot and navigator felt unable to continue. Once clear of the LFS Scottish Military Radar were notified of the Airprox in accordance with current procedures. He assessed the risk of collision as being high.

THE TORNADO GR4 (B) PILOT reports flying a singleton instructional sortie with a student Navigator in the rear seat in a grey Tornado ac with HISL selected on, squawking 7001C and not in receipt of an ATC service. While heading 350° at 420kt and 420ft and during a fixing routine another Tornado was seen to pass just ahead and slightly below his flightpath in a gentle right turn. The Lossiemouth flight notification system had alerted him to the possible presence of this ac around this area, however they were 30min late on their planned time. Since the Nav was head in, the pilot was head out maintaining a good lookout but the other ac was not seen until it was very close at a range of about 50m. He assessed the risk of collision as being high.

STATION COMMENTS This was a very close Airprox. That an Airprox can occur in bright daylight and excellent visibility over a flat surface is disturbing; however there are a number of factors that may have contributed to the late pick up. Firstly, since the ac were on a near collision course, the other Tornado would have been stationary in the canopy until it bloomed in size. Secondly the conflicting grey Tornado approached from below, over a grey sea. Thirdly, the Navigator was head down completing a fix and the pilot, although looking out was also momentarily monitoring the position of the fix point marker in the HUD; this point was to the left of the nose and away from the approaching Tornado to the right of the nose.

AIRPROX REPORT No 161/03

The pilot first became aware of the approaching Tornado as it appeared in the lower part of the HUD passing right to left at a reported range of 150ft horizontally and 50ft below. There was insufficient warning to take avoiding action.

Whilst there are many contributory factors in the late spot of the camouflaged ac at low level the investigation into this Airprox has identified 2 that may have been applicable in this case i.e. the danger of becoming fixated on one area of lookout or cockpit management for too long and the importance of looking around cockpit obstructions.

UKAB Note (1): In order to identify confliction areas at low level where ac are likely to cross tracks RAF Lossiemouth uses a Flight Notification system that requires Sqns to fax their route details to all other Sqns on the station. Then, at the outbrief, crews compare these faxes with their own formations, routes and identify areas of confliction at low level. However, if any formations take off late the calculated conflictions are no longer valid. Ironically in this case the 2 Tornados did meet in the expected area despite a 30 min delay.

Mention is made in the accompanying Pilot (A)'s report of the value of RHWR in detecting the Ground Mapping Radar (GMR) of other ac. The RHWR on Pilot (B)'s ac was unserviceable and the crew therefore had no sensors other than lookout to detect the approach of the other ac.

RAF Lossiemouth are continually looking at methods of ensuring that crews get airborne with the most up to date prediction of confliction areas; however, this work is labour intensive and while a degree of risk reduction may be possible, it is unlikely to fully resolve the issue. Nevertheless, the Stn will continue to review and amend procedures to make every attempt to minimise the risk of confliction.

HQ STC comments that the closure rate between these 2 ac was in excess of 14nm per min. Couple this with the average head-on, low-level pick-up range of 2nm and the crews would have had less than 9sec to detect, react and avoid each other. The use of on-board sensors (RHWR), and the last minute avoiding action, almost certainly prevented a catastrophic event which reinforces the teaching that fast-jet crews must minimise their heads-in time and strive to maintain at least one crew member heads-out at all times. The fact that both the pilot and navigator in one of the ac were actively looking for another Tornado, and did not see it until very late, further reinforces this.

The lesson here is that if you suspect an ac is approaching, climb above its likely operating band and manoeuvre to 'flash' your presence.

The RAF Lossiemouth Flight Notification System has obvious limitations when crews do not attain their planned departure times, however, this system is the best we have for mitigating the risk and reducing the probability of a re-occurrence.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

This incident provided an excellent example of the inherent risks involved in high speed, low-level military operations.

Both ac were operating legitimately in LFA 14 and aware of the presence of each other in the area and of possible points of confliction along their routes. Further, the crew of Tornado (A) was aware through their electronic device of the approach of the other ac. However, a large lump of Scottish granite had obscured the ac from one another until the final stages of their approach to the confliction point. Since there was insufficient information, it has not been possible to calculate the first point that the two ac

would have been line of sight with each other but, from the report of pilot (A) concerning their RHWR indications, this was just long enough to allow the crew to concentrate their lookout on the constant bearing of approach of the other ac. This was probably less than 4nm equating to about 15sec. It seems however, that in the prevailing light and background colour conditions that the Tornado camouflage scheme worked very well as, despite the concentrated lookout, the other ac did not emerge from the into sun background until it was very close indeed.

The crew of Tornado (B) were engaged on a navigator instructional sortie and at the time running up to the confliction the student navigator was necessarily 'head in' updating his navigation equipment. At that moment the pilot was faced with a dilemma; while he was very aware of the additional look out responsibility this placed on him, he also had to check visually through the HUD the position of the fixing marker relative to the fix point on the surface; this took his attention left of the ac's nose.

Although both pilots saw each other's ac, the timescales were such that only the pilot of Tornado (A) had time to manoeuvre his ac and it was probably as a result of this manoeuvre that the other pilot saw the ac some 50m away. The Board was informed by a specialist that it was probable that the reported heights of the ac were accurate since both were flying by reference to Rad Alt with a head-up read out; they therefore assessed that there had been about 30ft height separation between the ac. Both pilots stated that there was lateral separation, one estimated 50ft and the other 150ft, but it was not possible to determine which was more accurate. The Board therefore assessed the miss distance to be about 30ft vertically and in excess of 50ft laterally, much too close to assure the safety of both ac. Members also thought it unlikely that the manoeuvre by the pilot of Tornado (A) was conducted in time to change substantially the flightpath of his ac; it was therefore only by good fortune that the ac had not collided.

Although it could be argued that Tornado (A) had a 'Traffic Warning System' Tornado (B) was pointing down sun and therefore best placed for its crew to acquire the opposing ac visually, which they did not and had no warning of (A)'s approach. Had such assistance been available to them both crew members of Tornado (B) would almost certainly have transferred their attention from their fixing tasks to the approach of the other ac and the pilot would probably have changed his flightpath to assist visual acquisition of it. While the parameters in this incident were very close to being a worst-case scenario, with the ac becoming line of sight to each other at a late stage, the Board assessed that the additional warning provided to pilot (B) by a Traffic Warning System would have increased the miss-distance by a substantial margin.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: An effective non-sighting by the crew of Tornado (B) and a very late sighting by the crew of Tornado (A).

Degree of Risk: A.

AIRPROX REPORT No 163/03

AIRPROX REPORT NO 163/03

Date/Time: 21 Oct 1245

Position: 5317N 00053W (App RW32
Headon)

Airspace: UKDLFS LFA 11 (Class: G)

Reporting Ac Reported Ac

Type: Microlight Tornado GR4

Operator: Civ Pte HQ STC

Alt/FL: 400ft 400ft
(QFE) (Rad Alt)

Weather VMC VMC

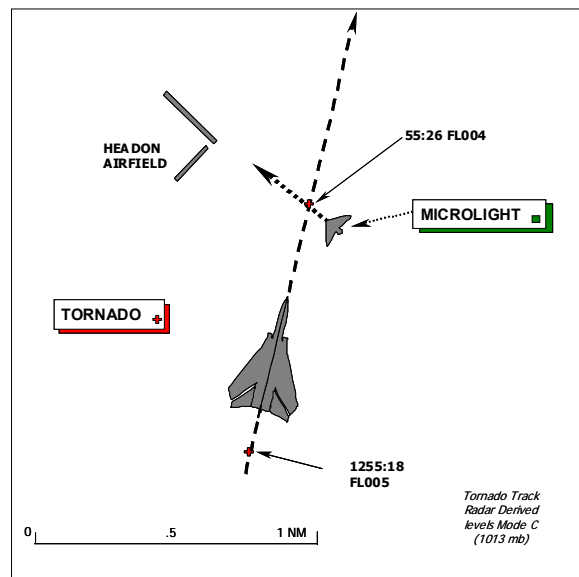
Visibility: >10km NR

Reported Separation:

0 H 100ft V 500-1000ft H 200ft V

Recorded Separation:

NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE MICROLIGHT PILOT reports flying a blue and white Flexwing Microlight with no lights, radio or SSR fitted on a sortie from Netherthorpe to Headon. On his return from a practice cross-country exercise with a student, he was on a final approach to RW 32 to land at Headon Microlight field, heading 320°M at 50kt. On passing 400ft QFE they suddenly heard a loud noise and without any other warning a military ac, possibly a Jaguar, passed 100ft directly beneath them on a heading of approximately 010°. He thought that the military pilot had seen them as he made a deviation from his track after passing beneath in what appeared to be an attempt to look behind his ac. There was no time to take any avoiding action and assessed the risk of collision as being high.

THE TORNADO GR4 PILOT reports that he was the rear seat captain flying a check sortie, flying a grey ac in the UKDLFS, with nav lights and HISLs selected on, squawking 7001C and listening out on the LFS common frequency. While transiting to the SE of Gamston heading 013° at 420kt flying to the North, preparing for the next SAP, a microlight was sighted in one-thirty at a distance assessed when first seen as being ½ nm, slightly higher and appearing to be on a westerly heading. He informed the front seat pilot who took evasive action by bunting the ac and turning to the left to increase the horizontal separation and the microlight passed between 500 and 1000ft to his right and 200ft above him. He considered the risk of collision as nil as he saw the other ac throughout.

Having seen the microlight, albeit at short range, they took positive evasive action to ensure safe separation in Class G airspace.

UKAB Note (1) The Replay of the Claxby Radar shows the Tornado heading NNE to the E of Gamston. The Microlight does not paint at any time. As accurately as can be assessed the Tornado passes 3.3nm to the E of the AF datum at Gamston, equating to about ½ nm to the E of Headon AF. Although there is a 600m discrepancy between the Lat and Long position and the Grid Reference in the UK Mil AIP of Headon Microlight site, the error is in such a direction that it does not affect the distance by which the Tornado misses the airfield. (The position published on the Headon Web Site is also different again to both the Lat and Long and the Grid positions).

STATION COMMENTS. The Station FSO reported that he had spoken with the front seat pilot and the QFI and confirmed that the sortie was correctly planned and authorised as a singleton QFI check on the

front seat pilot. The front seat pilot spotted the microlight almost simultaneously with the captain and as the pilot in control, took evasive action to ensure a safer and wider separation. The crew were aware of the proximity of both Gamston airfield and the microlight site to the SE.

The crew are confident that this was an Airprox in Class G airspace where "See & Avoid" operates. In this case the GR4 crew saw the microlight, albeit late, and took evasive action to ensure safer separation.

This was the second Airprox on this unit with a microlight in a few weeks and the SFSO highlighted the incidents at the next Stn Flight Safety meeting to promote awareness.

Unfortunately due to a technical problem there was no HUD video available of the incident.

HQ STC comments that the Tornado saw the microlight and avoided it by the largest possible margin in the small amount of time they had. The fact that HISLs, a radio and SSR are not fitted to the microlight, and that it did not show on the Claxby Radar recording, emphasises the difficulty that fast jet crews have in detecting such a small ac by purely 'see and avoid'. Had the microlight been fitted with light-weight equipment to increase its conspicuity, then there is a good chance that the Tornado pilot would have detected their presence earlier and avoided by a larger margin. Similarly had a radio been used by the microlight then Waddington Zone (LARS) could have warned of the Tornado's presence. It is of note that Headon does not appear on the CAA 1:500,000 chart (Edition 29) and is not contained within some VFR flight guides. This lack of promulgation has foiled our attempts to determine the airfield's exact location, in order to highlight the discrepancies between the Mil AIP and the UK LFC.

It was imprudent however, of the Tornado to route so close to the microlight site, where climbing and descending ac can be expected. It is also questionable whether the Tornado needed to route through such a narrow chokepoint on a routine training sortie in the first place, where the lack of manoeuvring airspace always places a pilot 'between an infringement and an Airprox!'

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Although this incident occurred in class G airspace, the Microlight was on its final approach to land and Members considered that the pilot would have been concentrating on this aspect and not in a position to exercise a full lookout outside his 11-1 o'clock sector. Although specialists considered it unreasonable to expect the Microlight pilot to have seen the Tornado, they reminded pilots that looking briefly to the left and right while on such an approach outside the protection afforded by an ATZ was good practice.

Although agreeing that flight in congested airspace is often best avoided, members recognised that this was class G airspace and while the Tornado had a right to be there the geometry of the encounter meant that the Microlight had Right of Way. Experience suggested that in higher-pressure sorties with the crew concentrating on unusual aspects of the mission, the old adage of 'keep it simple' is well founded and that avoiding complications at the planning stage is time well spent.

A major factor in this incident was the aspect the Microlight presented to the Tornado crew. It was moving very slowly, at a similar height, on or below the horizon, and therefore both the small size of the ac and the lack of discernable relative motion exacerbated by the lack of colour contrast made it very difficult for the human eye to acquire. This was further complicated by the microlight being in the 1.30 and possibly behind the canopy arch from the pilot's view; however the rear seat pilot did, albeit at a late

AIRPROX REPORT No 163/03

stage, see it in sufficient time to warn the front seat pilot and to take vertical avoiding action, which at speed is always effective more quickly than a horizontal turn (assuming it can be accomplished safely).

Although this was a close encounter, Members considered that the see, react, move cycle had been achieved (just) in time to prevent an actual risk of the ac colliding.

The Board was informed that, although lightweight transponder technology was available, regrettably they were not light or small enough or widely available at a reasonable cost, probably due to commercial considerations. Further opinion was divided as to the viability of using a radar service in such circumstances.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A late sighting by the Tornado crew.

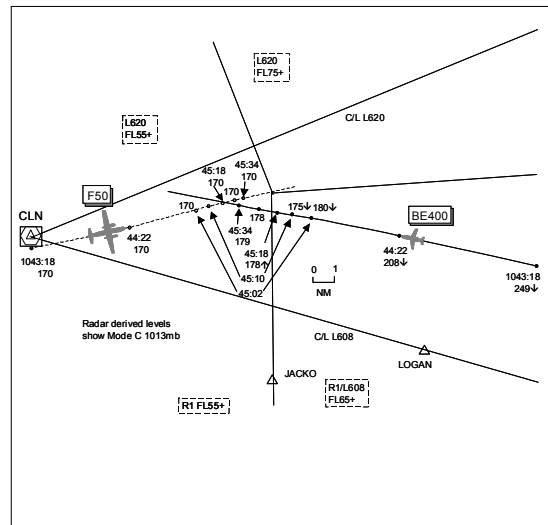
Degree of Risk: B.

AIRPROX REPORT NO 164/03

Date/Time: 23 Oct 1045
Position: 5152N 0124E (10nm E CLN)
Airspace: AWY L608/620 (Class: A)
Reporter: LTCC DAGGA SC

	<u>First Ac</u>	<u>Second Ac</u>
<u>Type:</u>	BE400	F50
<u>Operator:</u>	Civ Comm	CAT
<u>Alt/FL:</u>	FL175↓	FL170
<u>Weather</u>	VMC	VMC CAVOK

Visibility:
Reported Separation:
700ft V 1.5nm H 300ft V <0.25nm H
Recorded Separation:
500ft V 3.7nm H

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

THE LTCC DAGGA SC reports that the Sector was busy and that she was expecting 3 ABBOT inbound at the same time in the vicinity of CLN, all descending to FL180, one of which was the BE400. The outbound subject F50 was at FL170 in the same area and all of the ABBOT inbound were handed over late and high. The subject BE400 was seen approaching the F50 head-on, descending rapidly but it was not yet on her frequency; it was seen to descend to FL173 about 2.5nm from the F50 before climbing. The BE400 pilot then called on frequency reporting a TCAS RA, which she acknowledged, followed by the F50 pilot also advising of a TCAS manoeuvre. She confirmed the cleared level of FL180 with the BE400 pilot, which was not disputed; there had been no time to give avoiding action. Later, S12, the next sector, advised the Coordinator that by the time the F50 pilot received the RA warning, the BE400 had climbed 500ft above.

THE BE400 PILOT reports flying inbound to Luton at 230kt, he thought, and in receipt of an ATS from London squawking an assigned code with Mode C. In the vicinity of CLN descending through FL175, TCAS gave an RA "climb" warning, against traffic 4nm ahead at FL170, and the guidance was followed. The other ac, a F50, was visually acquired, the minimum separation achieved during the manoeuvre was estimated to be 700ft vertically and 1.5nm horizontally.

THE F50 PILOT reports heading 100°, he thought, at 200kt cruising at FL170 en route to Holland and in receipt of an ATS from London. After passing CLN routeing towards REDFA, TCAS gave an RA "descend", demanding a ROD of >2000fpm. Within 2sec he disconnected the A/P and commenced descent but the other traffic, a Beechcraft, was seen to be already passing nearly overhead their ac by 300-400ft, displaced laterally by 100-200m to their R. He stopped his descent as the traffic cleared behind; his max deviation had been <100ft.

ATSI comments there are no apparent ATC causal factors. The LACC S13/14 Tactical Controller (S13/14T) cleared the BE400 pilot to descend to FL180, the agreed level for transfer to TC, which was read back correctly. Shortly afterwards the flight was transferred to TC, at which point it was passing FL219. By the time the BE400 pilot contacted TC DAGGA, the pilot reported clearance to FL160 and receiving a TCAS RA climb. STCA activated when the BE400 was at FL175 and 3.7nm distance from the F50 at FL170, whose pilot also reported a TCAS alert. TI was passed to the F50, by which time the confliction was resolved by the BE400 climbing to FL180.

AIRPROX REPORT No 164/03

UKAB Note (1): The LACC S13/14 RT transcript reveals that, during a step descent profile, the S13/14T instructs the BE400 pilot, at 1041:30, to fly *"...indicated airspeed three zero zero knots or greater"*. Later, just after 1043:00, the S13/14T transmits *"BE400 c/s descend flight level one eight zero expedite descent please"* which went unanswered and after repeating the instruction the BE400 pilot read back at 1043:20 *"Ah confirm descending one eight zero expedite descent BE400 c/s"*. The S13/14T replies *"Affirm"* and then just over 40sec later the BE400 is transferred to TC DAGGA frequency.

UKAB Note (2): The TC DAGGA Sector RT transcript reveals the following exchanges shortly after 1045:00: -

BE400: *"Radar good morning BE400 c/s"* which was followed by a simultaneous unintelligible transmission.

Just after 1045:10 a transmitter is switched but no modulation occurs followed by: -

TC DAGGA: *"BE400 c/s London"*.

BE400: *"Er sorry we ha- we were cleared flight level one six zero we had to climb due to TCAS resolution"*.

TC DAGGA: *"BE400 c/s roger"*.

F50: *"yeah we had the same problem here er from the F50 c/s"*.

1045:30 TC DAGGA: *"F50 c/s maintain FL170 there's traffic right to left erm a thousand feet above you now at this time"*.

F50: *"Yeah he's er started to climb again thanks"*.

BE400: *"BE400 c/s descending back to flight level one six zero clear of conflict"*.

TC DAGGA: *"BE400 c/s roger maintain flight level one eight zero your cleared level was flight level one eight zero"*.

BE400: *"maintaining flight level one eight zero BE400 c/s"*.

UKAB Note (3): Analysis of the Claxby radar recording at 1043:18 shows the F50 passing S abeam CLN VOR tracking 080° level at FL170 with the BE400 22.5nm to the E tracking 280° and descending through FL249. Both ac continue on steady converging tracks, the BE400 descending at ROD 4000fpm and at a G/S measured at 360kt. At 1045:02 the BE400 is seen descending through FL180 with the F50 just L of its 12 o'clock range 5.2nm slowly crossing/converging L to R 1000ft below. Minimum separation occurs on the next sweep 8sec later, the BE400 at FL175 with the F50 just about to pass through its 12 o'clock range 3.7nm 500ft below. The next sweep at 1045:18 shows the BE400 climbing through FL178 with the F50 dead ahead range 2.4nm. The CPA occurs 16sec later as the BE400 passes 0.33nm SW of the F50 at FL179, 900ft above it.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members wondered why the BE400 crew had reported on the TC DAGGA frequency that they were descending to FL160 having read back correctly FL180 on the previous frequency prior to transfer. Normal CRM procedures should have ensured that ATC instructions were checked 'cross-cockpit' on receipt thereby enabling accurate read back and subsequent execution. No reason could be found from the information available for this erroneous 'cleared level' proffered by the Beech crew during the encounter and members were disappointed that questions on the CRM issue had gone unanswered by the Company concerned during the investigation. So, for whatever reason, after correctly acknowledging the cleared level of FL180 with the S13/14T, the BE400 crew, during the changeover to the TC DAGGA Sector, descended below their cleared level and into conflict with the F50. This had caused the Airprox.

It was noted that following the initial call by the Beech crew reporting a TCAS climb to the DAGGA SC, the SC had told the F50 crew to maintain FL170 owing to the BE400 crossing 1000ft above. Although this was not in accordance with the procedure stated in MATS Pt 1, (not to issue control instructions to ac contrary to the RA communicated by the crew), it was in response to the F50 crew's transmission that they "*had the same problem here*". One reason put forward was that the SC may have construed this transmission to mean the F50 crew was also carrying out a RA climb, and the 'maintain level' instruction was to ensure that the F50 did not climb into conflict. Although this aspect was not looked into during the investigation, pilot members stated that this anomaly showed the importance of using standard phraseology so that there was no possibility of misunderstanding a non-standard spoken transmission.

Turning to risk, the TC DAGGA SC had seen the confliction but with no time to give avoiding action. The F50 crew had received a TCAS RA and had quickly taken action to commence descent and had seen the BE400 descend to within 300-400ft of his ac before it climbed above them. The BE400 crew had been flying at high speed with a high ROD and received a TCAS RA climb when the F50 was 4nm ahead and had then followed the TCAS guidance. The radar recording shows the Beech crew's rapid response to the TCAS warning, the ac stopping descent 500ft above the F50's level when lateral separation had reduced to 3-7nm; it then climbed rapidly, within 8sec, to 800ft above the F50. The robust actions taken by the BE400's crew were enough to persuade the Board that any risk of collision had been effectively removed.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The BE400 crew descended below their cleared level into conflict with the F50.

Degree of Risk: C.

AIRPROX REPORT No 165/03

AIRPROX REPORT NO 165/03

Date/Time: 21 Oct 1157

Position: 5218N 0048E (RW03 Sywell - elev 429 ft)

Airspace: ATZ (Class: G)

Reporter: Sywell FISO

First Ac Second Ac

Type: Mainair Mercury PA28

Flexwing M/Light

Operator: Civ Trg Civ Club

Alt/FL: GL GL
(QFE) (QFE 996mb)

Weather VMC NK VMC CLBC

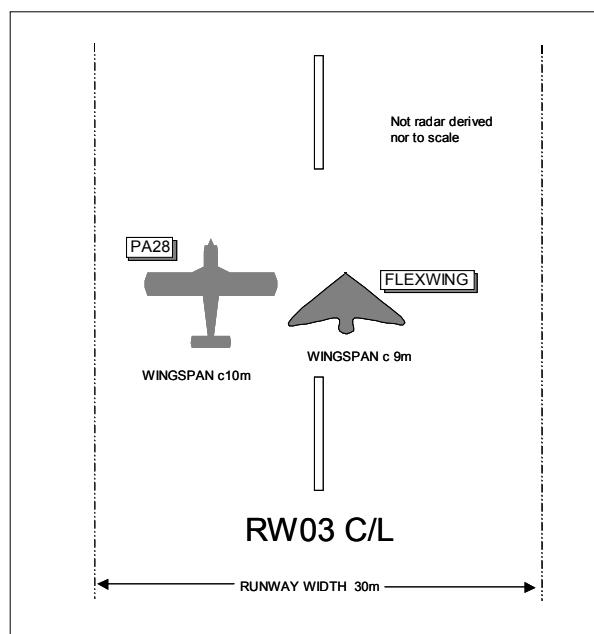
Visibility: NK 10km

Reported Separation:

5ft H NR

Recorded Separation:

NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE SYWELL FISO reports that the Flexwing M/Light was being flown by a low hours student carrying out LH ccts on RW03 and, on his 3rd cct, the M/Light pilot reported downwind. At the time 3 other fixed wing ac were joining, their pilots reported downwind in the order, AC1, AC2 and the subject PA28. The Flexwing pilot reported 2 ac ahead of him - being slow, AC1 and AC2 had overtaken him - and he was told to report final. AC2 reported final but as AC1 had called downwind before him, he asked the pilot of AC2 "*are you number one*" which he confirmed and it subsequently landed and vacated the RW. AC1 reported final and was told "*land at your discretion*". The PA28 pilot then reported final and was told "*one reported ahead*"; to which he replied to the effect "*...and the microlight ahead*", indicating that he saw AC1 and the M/Light. The M/Light pilot reported final and was told "*one reported ahead for a full stop*" i.e. AC1; this ac landed and vacated the RW. The M/Light pilot was told "*touch and go at your discretion*" and subsequently landed 200m along the RW from the T/Hold whilst the PA28 continued its approach. As the M/Light slowed to a walking pace the PA28 landed to the LHS of the M/Light, touching down abeam of it. He told the M/Light pilot to wait on the RW whilst the PA28 vacated the RW at the stop end. Later when he talked to both pilots, the M/Light pilot said he landed 2yd to the R of the RW C/L whilst the PA28 pilot said he landed on the RW. RW03/21 is 30m wide and at the time of the incident, separation appeared "*minimal*". The PA28 pilot went on to say that he had expected the M/Light to climb away and he considered that a 'go-around' would have been unsafe.

THE MAINAIR MERCURY FLEXWING M/LIGHT PILOT reports flying solo ccts at Sywell and in receipt of a FIS from Sywell INFORMATION on 122.7MHz. After 40min of flying he was aware of 2 light ac behind him on the downwind leg so he called the FISO and requested that the ac take priority for landing ahead of him, which the FISO acknowledged and passed the information onto the other acs' pilots. Both of these ac overtook him and landed before him. After he called "*final for a touch and go*" the radio became very busy as the FISO gave taxiing instructions to the pilots of the 2 ac that had just landed. Immediately after he landed, approx 2m to the R of the RW C/L, he was surprised to see another light ac touching down about 10m in front and 20m to his L, estimating the clearance between wingtips to be about 5ft. He then heard the FISO ask the ac's pilot if he was aware of the M/Light to which the pilot replied "*at the last minute*". He thought the FISO then asked the ac's pilot to confirm that he had reported visual contact with the M/Light earlier on the approach; the pilot replied "*yes*". He was then asked to

come to a full stop to allow the light ac to vacate the RW after which he was allowed to continue his training flight.

THE PA28 PILOT reports flying inbound to Sywell from Wellesbourne Mountford with 2 passengers and in receipt of an AFIS from Sywell INFORMATION on 122.7MHz. The visibility was 10km 2000ft below cloud in VMC, the ac was coloured blue/white and the nav, landing, taxi and anti-collision lights were all switched on. Whilst in the cct, he and both passengers all acknowledged that they could see 2 ac in front including a M/Light. When he reported downwind there was no apparent problem as he heard the M/Light pilot say that he was *“hanging around, that I will be up here for a while”*. He and his passengers discussed this, as they saw the Flexwing hovering near the airfield. The ac in front descended underneath the M/Light and landed without problems. By the time he had established on finals, all of those onboard were aware of their position relative to the Flexwing although it was by now at a higher altitude. He checked with his passengers to see if they were aware of anything else or maybe something he had missed. ATC asked if he could see the M/Light in front, to which he replied *“affirm”*; it was ahead and still above. He asked the passengers if they, like him, thought the last message heard from the Flexwing pilot appeared to be true in that it was staying up and not coming down yet. He continued his descent without the M/Light being visible, but without any worries, as it was still above him like the previous ac. Suddenly, the M/Light appeared in front of him to the R of the RW C/L. He was concerned that the Flexwing might try a touch and go and that it might be safer to land well to the L of the RW C/L and allow it to continue with whatever its pilot had in mind. The thought of going around was considered but he believed that if the Flexwing did power-up and take off, there would have been a greater risk of collision or a near miss. Although only an AFIS was being provided, if there really had been a greater chance of an accident then someone from the Control Tower could have said something.

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

UKAB Note (2): The Rules of the Air Regulations 1996 Rule 17 Rules for avoiding aerial collisions para (6) Order of landing states: *(a) An aircraft while landing or on final approach to land shall have right-of-way over other aircraft in flight or on the ground or water. (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 right-of-way, but it shall not cut in front of another aircraft which is on final approach to land or overtake that aircraft.* Para (7) Landing and take-off (b) states: *“A flying machine or glider shall not land on a runway at an aerodrome if the runway is not clear of other aircraft unless, the case of an aerodrome having an air traffic control unit, that unit otherwise authorises.* Rule 39 Flight within aerodrome traffic zones at an aerodrome having an aerodrome flight information service unit para (2) states: *An aircraft shall not fly, take off or land within an aerodrome traffic zone of an aerodrome to which this paragraph applies unless the commander of the aircraft has obtained from the aerodrome flight information service unit at that aerodrome information to enable the flight within the zone to be conducted with safety.* Para (3) states: *The commander of an aircraft flying within the aerodrome traffic zone of an aerodrome to which this paragraph applies shall: (a) cause a continuous watch to be maintained on the appropriate radio frequency notified for communications at the aerodrome or, if this is not possible, cause a watch to be kept for such instructions as may be issued by visual means.*

UKAB Note (3): The CAP410 Manual of Flight Information Services Part B Aerodromes states:

1.1 A Flight Information Service (FIS) provided at an aerodrome is a service provided to give information useful for the safe and efficient conduct of flights in the ATZ. From the information received, pilots decide the appropriate course of action to be taken to ensure the safety of flight whilst taking off or landing of flying in the ATZ.

1.2 A Flight Information Service Officer (FISO) provides an information service to aircraft that are flying or about to fly within the ATZ. Under Rule 35 of the Rules of the Air, FISOs at aerodromes are permitted to issue instructions to a) departing aircraft about to move or moving on the apron and manoeuvring area up to the holding point of the runway to be used for departure; b) arriving aircraft moving on the

AIRPROX REPORT No 165/03

manoeuvring area and apron, following the completion of the landing roll; and c) all other taxiing aircraft intending to move or moving on the apron and manoeuvring area, including the crossing of runways. Elsewhere on the ground and at all times in the air, information shall be passed.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It was clear that there had been a misconception by the PA28 pilot as to his responsibilities when flying within an ATZ when the service was being provided by a FISO. From the information given by the FISO and from the other pilots' transmissions made on the frequency, the onus was then on the PA28 pilot to decide the appropriate course of action to be taken to ensure safe separation. Clarification on any doubts about the situation should have been sought at an early stage from either the FISO or the other pilot. The PA28 pilot should have heard the landing call from the FISO addressed to the Flexwing pilot so, irrespective of the height of the M/Light, the PA28 pilot should have positioned his ac to follow behind it. The option was always available to execute a go-around by moving onto the dead-side of the cct whilst overtaking the Flexwing and maintaining visual contact. Indeed, this is what the PA28 pilot should have done. Instead he had demonstrated poor airmanship by continuing his approach and then electing to land on the RW occupied by the M/Light, contrary to Rule 17 para 7 (b). This had caused the Airprox.

The Flexwing pilot had seen the PA28 only after it had landed just in front of and displaced slightly to the L of him. The actions taken by the PA28 pilot had not taken into account the possibility that his ac and/or the Flexwing could have deviated from the C/L without warning during their landing rolls which led the Board to conclude that safety had not been assured during the encounter.

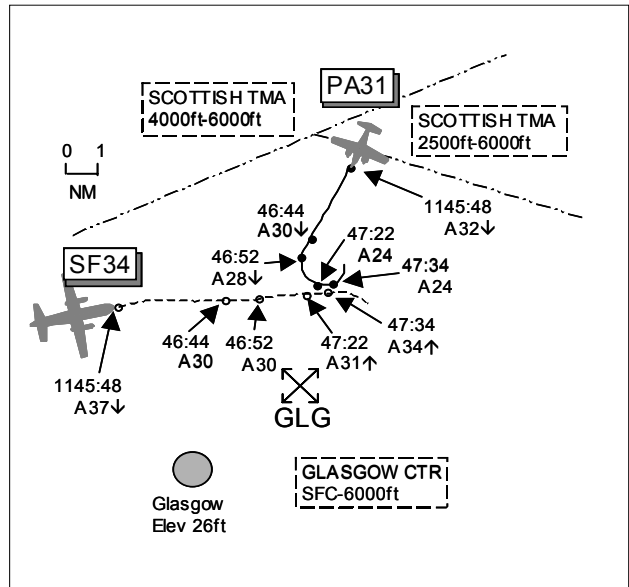
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The PA28 pilot continued to approach and elected to land on the RW that was already occupied by the Microlight, contrary to Rule 17 para 7 (b).

Degree of Risk: B.

AIRPROX REPORT NO 166/03

Date/Time: 24 Oct 1147
Position: 5558N 0420W (7nm NE Glasgow Airport - elev 26ft)
Airspace: CTR (Class: D)
Reporting Ac Reported Ac
Type: SF34 PA31
Operator: CAT Civ Comm
Alt/FL: 3500ft↓ 2500ft↓
 (QNH 1025mb) (QNH 1025mb)
Weather VMC CLOC VMC CLNC
Visibility: 60km >10km
Reported Separation:
 500ft V 0.5nm H 800ft V
Recorded Separation:
 700ft V 0.5nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE SF34 PILOT reports flying inbound to Glasgow at 200kt positioning wide downwind RH for RW23 having been cleared for a visual approach and in receipt of an ATS from Glasgow TOWER. He visually acquired a twin-engine ac, possibly a Seneca, in his 10 o'clock range 4nm descending through his level on a heading that would take it behind. The ac then commenced a hard L turn and TCAS gave a TA alert as the other ac turned through a southerly heading in his 1130 position range 0.5nm, 500ft below. In order to achieve safe separation against its possible further manoeuvring, he disconnected the A/P and flew an 'S' type flight path maintaining height until the conflicting ac, coloured white/blue, appeared to be on a safe track, it having turned away to the L. He then turned onto R base for an uneventful landing. At some stage during the incident, ATC did pass a warning of traffic descending without clearance which he had acknowledged with "visual".

THE PA31 PILOT reports inbound to Glasgow VFR and in receipt of a FIS from Glasgow on 119.1MHz squawking an assigned code with Mode C. The visibility was >10km in VMC, the ac was coloured white/blue with nav and strobe lights switched on. Approximately 9nm N of Glasgow heading 180° at 160kt descending through about 2500ft QNH 1025mb he was told to hold in his current position. He had infringed the Glasgow CTR by about 1-2nm and ATC informed him of traffic which he saw, a twin-engine low winged ac on a crossing/converging track R to L. Immediately he took action by steepening his descent path and increasing his AOB to remain clear of it by 800ft vertically. During the encounter his vision from the cockpit had been good and had noted that his ground speed had increased owing to a northerly wind; he didn't feel there had been a major risk.

ATSI reports that the SF34 was being positioned downwind RH for a visual approach to RW23 at Glasgow. The pilot had reported visual and when the PA31 established communication with Glasgow Approach, the SF34 was descending to 5000ft. The APR commented that, when the PA31 contacted Glasgow the pilot did not use the company prefix and this delayed his recognition of the flight. When the full c/s was eventually used (on the pilot's 4th call), he reported being 18nm to the N of the airfield descending to 2000ft VFR. In order to identify the ac the controller instructed the flight to squawk 1733 but no clearance to enter the Glasgow CTR was issued. Shortly afterwards, the SF34 was given descent to 4000ft, on top of an outbound light ac climbing to 3000ft. The radar at 1143:53, i.e. just after this descent was issued, shows the SF34, at 5000ft, entering the Scottish TMA, Class E Airspace, to

AIRPROX REPORT No 166/03

the NW of Glasgow Airport. The PA31 is approximately 20nm to the NE of the SF34, descending through 3200ft.

Once clear of the outbound ac, the SF34, now within the CTR, was informed that *“there’s no altitude restriction now on your visual approach routeing via the Golf Lima Golf”* and was transferred to the TWR frequency. The PA31 was still heading S, at the time, outside the CTR. The APR stated that, owing to workload (NB in the period leading up to the Airprox he was controlling 6 inbound ac, including the subject ac, two outbounds and an overflight) he only observed the PA31, on his radar display, after it had entered the CTR. [UKAB Note (1): The PA31 enters the CTR at 1145:28]. He immediately transmitted to the PA31, at 1146:39, saying *“ if you take up a left-hand orbit please er in your present position”*. Once the pilot had acknowledged the instruction, TI was passed on the SF34 going through his twelve o’clock, from R to L, at a range of about 3 miles. The pilot reported visual with the traffic and was instructed to proceed *“no further south towards that traffic”*. The radar at 1146:44 shows the PA31, heading S within the Glasgow CTR at 3000ft. The SF34 is about 3.5nm to its SW, heading E, at the same altitude. The two ac close to about 2nm and 200ft at 1146:52 but by the time the radar returns reach the CPA of 0.45nm at 1147:34, the vertical separation is 1000ft. The SF34 has climbed to 3500ft and the PA31 has descended to 2500ft. The PA31 was, subsequently, instructed to take up a northerly heading to leave the CTR.

[UKAB Note (2): Minimum separation occurs at 1147:22, the PA31 descending through 2400ft passing 0.5nm ahead of the SF34 which had commenced a climb indicating 3100ft].

Meanwhile, the ADC, who was operating with a trainee, reported that he became aware of an unknown (to him) ac on a 1733 squawk, visible on the ATM, at the same level as the SF34 and on a conflicting track. He immediately issued the SF34 with TI *“there’s traffic in your left er ten o’clock range two miles tracking towards you indicating two thousand seven hundred feet believed to be VFR. Do you have it in sight?”* The pilot confirmed a visual sighting, within one mile and reported turning L to keep the traffic in sight.

It is considered that it would have been prudent for the APR to instruct the PA31 pilot to remain outside CAS, especially as he was busy and would probably not be able to monitor the ac’s progress closely. In any case, owing to the number of inbound flights at the time, it would have been necessary to hold the ac off before being able to fit it into the traffic pattern.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board considered events leading up to the incident and noted the PA31 pilot did not use his full c/ s which had hindered his identification by the Glasgow APR. The controller had issued a squawk code but then turned his attention to other traffic. Meanwhile the APR had removed any altitude restriction on the SF34’s visual approach routeing via the GLG NDB and transferred it to Tower. Next the PA31 pilot had continued heading S, entering the Glasgow CTR without clearance and had flown into conflict with the SF34. This had caused the Airprox. Although the APR had not told the PA31 pilot to remain outside CAS, the onus was always on the pilot to do so and to ensure that positive entry clearance was received prior to entry.

A minute passed before the APR spotted the penetration but the controller had been busy at the time. He attempted then to resolve the developing situation by instructing the PA31 pilot to commence a LH orbit backed up by passing TI on the SF34. The PA31 pilot saw the approaching SF34 and had steepened his descent path and increased his AOB to pass clear of it, by 800ft vertically, whilst the APR

told him not to fly any further S. Meanwhile the SF34 crew had visually acquired the PA31 4nm away and had watched it turn L towards them, a change that had generated a TCAS TA alert. The Saab pilot had then manoeuvred his ac to maintain safe separation from the PA31, which he estimated had passed 0.5nm away to their L and 500ft below. Also, the ADC had noticed the potential conflict on the ATM and had passed TI to the SF34 crew. All of these elements, when combined, were enough to persuade the Board that any risk of collision had been effectively removed.

PART C: ASSESSMENT OF CAUSE AND RISK

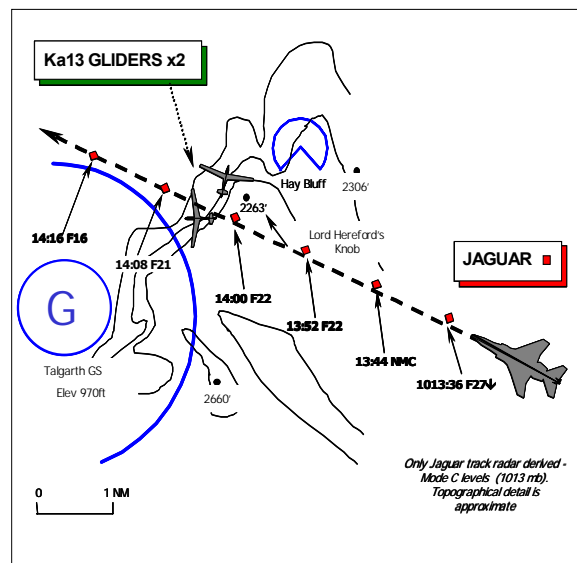
Cause: The PA31 pilot entered the Glasgow CTR without clearance and flew into conflict with the SF34.

Degree of Risk: C.

AIRPROX REPORT No 167/03

AIRPROX REPORT NO 167/03

Date/Time: 24 Oct 1012
Position: 5200N 00308W (6km NE Talgarth Glider Site)
Airspace: UKDLFS LFA7 Class: G
Reporting Ac Reported Ac
Type: Gliders K13&T10 Jaguar
Operator: Civ Club HQ STC
Alt/FL: 2570ft 500ft
(QNH) (Rad Alt)
Weather VMC Below Cl VMC Below Cl
Visibility: >20km 20km
Reported Separation:
100m H 0 V 100ft H 50ft V
Recorded Separation:
NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE GLIDER K13 PILOT reports that two Ka13 two-seat training gliders, both white with blue markings, were soaring the NW facing ridge of the Black Mountains, one heading 270° and the other 010°, both at 50kt. They had just passed each other when a Harrier [UKAB Note (1) Actually a Jaguar so the text hereon has been amended to avoid confusion] on a NW heading came over the top of the ridge and passed between the gliders which were level at 2570 ft QNH, passing about 100m behind K13 and 400m from T10. The Jaguar pilot appeared to see the gliders and took evasive action. Exactly 8min later another pair of Jaguars were seen following the usual low-level route along the Llantony valley and Gospel Pass, but these were 'on track and presented no hazard'. This 'fast jet low level route' is well known to the Black Mountains Gliding Club and marked on the Club safety Board and the Club policy is that it is not to be crossed below 3000ft QNH (Monday – Friday); this has provided an adequate margin. However, this Jaguar was traversing high ground parallel to and 1km SW of the 'normal route'. It is suspected that he took the wrong (left) valley, which has a blind upper end. Since the Jaguar was very close when they first spotted it, they did not take any avoiding action but assessed the risk of collision as high.

An almost identical previous Airprox took place on 19 July 01 (122/01). [UKAB Note (1) Also 189/02 on 25 Sep 02]

UKAB Note (2). The UK Mil AIP for LFA7 imposes a unidirectional low-level flow from SE to NW in the gap between the Talgarth Gliding Site and the Hay Bluff Hang Glider Site. In addition, crews are advised to note that 'a considerable amount of soaring takes place on most weekdays in the wider Black Mountain area'.

UKAB Note (3) The recording of the Clee Hill radar shows only the Jaguar which tracks from ESE to WNW over the reported position of the Airprox. However 54sec after the Airprox, a primary return can be seen in approximately the position that the Jaguar had overflowed.

THE JAGUAR PILOT reports flying a grey ac on a low-level tactical mission from St Athan to Coltishall with HISLs selected on with a London Mil Squawk with Mode C, but not in communication with any agency. He was the No3 in a formation of 3 Jaguars and acting as the aggressor of the formation. While positioning for a low level engagement, heading 290° at 430kt, flying NW through the Talgarth

chokepoint at 500ft agl, he became visual with a slow moving ac approximately 2–3nm in his one o'clock, moving left to right. There was no conflict with this ac but his attention was held by it while he tried to identify its type. Approximately 5sec later he recognised the ac as a glider and looked back to his 12 o'clock and saw another glider flying right to left directly in front of him, level and at a range of between 1000-1500ft. He immediately broke into a hard right hand climbing turn to pass above and behind the glider. He assessed that, if he had looked to the front 1sec later, he would have collided with the tail of the glider. He assessed the risk of collision as high.

HQ STC comments that this Airprox is the latest of a series, 122-01, 156-01 and 189-02, in recent years. The area in question is Class G airspace between a busy glider site and a hang glider site that forms a chokepoint. It is subject to a UKLFS flow arrow in a NW direction to solve possible conflict between other military UKLFS traffic. There is also a warning contained within the UK Mil AIP warning of gliding over the 'wider Black Mountain area'. The effect of this inexact definition is that aircrew are looking for gliders/hang gliders/paragliders that *possibly* might be present over a very large area. Our preferred solution would be for all ridge soaring in this area to be promulgated by 'Y' series NOTAM (as suggested in AP189-02) for the specific area in which it takes place. This would warn all Class G users of this activity that, by the nature of the many reports, must be difficult to see, possibly because of local topography or lighting. We recommended strongly that action be initiated as a result of the warnings given by this and previous incidents before there is a serious accident. We further recommend that a RAF representative meets with office bearers of the Gliding Club concerned in the near future to determine a mutually agreeable procedure to implement this recommendation.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The BGA advisor reminded Board Members in written comments that there are a number of ridges which are used by gliders within the Welsh mountain area and that not all are close to gliding sites. Such incidents however are not a local issue; gliders from 4 sites in Wales plus Aston Down, Nympsfield and Sleaf will very often use the same ridges and the same wave. They agreed with the HQ STC that briefings for both gliding clubs and military units, including ATC units, would help and increase awareness of each other's activities.

Although not directly relevant to this Airprox, it was clear that there were some major misconceptions at the gliding club concerned regarding Military low flying activities and the Board welcomed HQ STC's offer to task RAFLO Wales to visit gliding clubs, in company with a BGA representative to brief them.

Notwithstanding the BGA comment above, it was obvious to members that since this was the third Airprox in the immediate area a local problem existed. The location was class G airspace and both ac had a right to be there; neither however would wish to be involved in an accident and it was sensible to introduce some sort of information system to provide warning of each other's activities. Since it is almost impossible to warn gliding clubs of individual military movements, a mutually agreeable system of notifying military pilots should be considered whenever favourable wave conditions promote significant gliding activity.

Since the glider involved in the Airprox was almost tail on to the Jaguar, not only would it have presented a very small target for the Jaguar pilot to see, but its pilot would not have been in a position to see the fast-approaching jet.

In his own very frank report the Jaguar pilot stated that, due to a combination of circumstances, this was a very late sighting of the conflicting glider. Members unanimously agreed that although the Jaguar pilot saw the glider at 1000/1500ft (about 2sec) it is unlikely that there was enough time for his avoiding action

AIRPROX REPORT No 167/03

to alter the flightpath of his ac by sufficient margin to prevent a collision. It follows therefore, that they did not collide only by chance and that there had been an actual risk of a collision.

[The Board was informed that, at the request of the BHPA all annotated hang-gliding sites on the Military Low Flying Chart have been removed. In this case however the choke point symbol will remain].

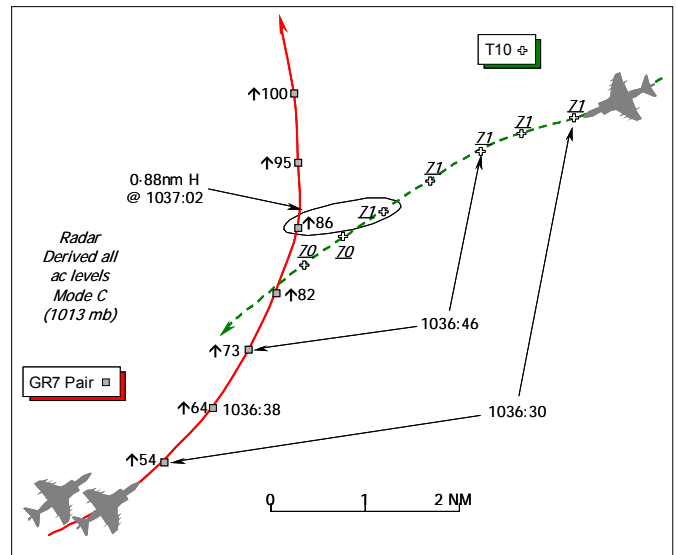
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A very late sighting by the Jaguar pilot.

Degree of Risk: A.

AIRPROX REPORT NO 168/03

Date/Time: 31 Oct 1037
Position: 5242N 0021 W (7½nm NE Wittering)
Airspace: London FIR (Class: G)
Reporter: Cottesmore DEPARTURES
First Ac Second Ac
Type: Harrier GR7 pair Harrier T10
Operator: HQ STC HQ STC
Alt/FL: ↑FL60 FL70
Weather VMC CLBL VMC CLBL
Visibility: 10km 10km+
Reported Separation:
 Departures: <2½nm H/200ft V
 1nm H/1000ft V 1nm H
Recorded Separation:
 0.88nm @ 1500ft
 200ft @ 3.3nm



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE COTTESMORE DEPARTURES CONTROLLER (DEPS) reports that Cottesmore was operating on RW05 and at Wittering RW08 was in use. A thick layer of cloud from about 400ft covered both aerodromes.

A pair of GR7 Harriers was ‘Pre-noted’ to depart from Wittering to the N, requesting a climb ultimately to FL270. The T10 was in the Wittering TACAN hold squawking A4647, level at FL70 under a RAS from Wittering APPROACH (APP). Co-ordination was agreed with APP that the

departing GR7 pair - off Wittering RW08 squawking A6141, would not climb above FL60 against APP’s T10 traffic, which would be restricted not below FL70 until horizontal separation was established. He passed the climbout restriction to Wittering TOWER - adding that the T10 was on recovery – so TOWER passed on the restriction to the GR7 pair within their departure clearance.

The GR7 leader reported airborne on the DEPARTURE frequency and requesting a RAS. The formation was identified, given ‘own navigation’ and instructed to climb to FL60 under a RAS. After a pause he issued traffic information to the GR7 pair about the T10 that was co-ordinated above them at FL70. However, the GR7 pair continued to climb; by the time he was able to transmit to stop the climb at FL60 it was too late as the pair was already passing FL70 on Mode C. He gave further traffic information to the GR7 pair, but the respective ac’s radar returns closed within 2½nm and 200ft on Mode C. He reaffirmed that they were only supposed to climb to FL60 with the T10 co-ordinated above at FL70, whereupon the GR7 lead pilot apologised and reported passing FL90. A handover was then effected to London MILITARY.

[UKAB Note (1): The Wittering Weather was CC YELLOW; surface wind 070/10; 4000m in Drizzle; SCT @ 300ft; OVC @500ft; Serviceable; QFE 968mb.]

THE HARRIER GR7 PILOT, a solo student, reports he was leading a pair with the No2 flown by a staff instructor pilot. The ac has a grey camouflage scheme, the HISLs were on and the allocated squawk was selected with Mode C, but neither TCAS nor any other form of CWS is fitted. Whilst departing from

AIRPROX REPORT No 168/03

Wittering in a straight climb at 300kt, a climbout restriction of FL60 had been passed by DEPS who was providing a RAS. However, whilst flying under IFR during a busy departure the restriction was forgotten and the formation climbed through FL60. His instructor No2 became aware that a 'level bust' was imminent, established radio contact with the T10 crew on another box and informed them of the developing situation. The T10 was sighted at a range of 2nm and passed about 1nm away some 1000ft below the pair at the closest point. No avoiding action was necessary and he added that all 3 ac were in communication and visual with each other; the "incident" was debriefed by those involved and the risk assessed as "nil".

THE HARRIER T10 PILOT, a QFI instructing a student, reports his ac has a grey camouflage scheme and the HISLs were on whilst flying at 240kt under IFR in VMC, in between cloud layers 1500ft above and some 3000ft below his ac with an inflight visibility of >10km. Neither TCAS nor any other form of CWS is fitted but the allocated squawk was selected with Mode C. Approaching a position 10nm E of Wittering, heading 270° in level cruise at their assigned level of FL70 he spotted the pair departing from Wittering about 3nm away heading N at 300kt. He had been informed by APP of the climbout restriction, but was in communication with the No2 (staff member) of the GR7 pair. While he assessed they posed no threat to him he pointed out the GR7 pair's error to them on RT.

THE COTTESMORE ATC SUPERVISOR reports the radar picture was good with no suppression and fully serviceable. Workload for both Wittering APP and Cottesmore DEPS was light. The Harrier GR7 pair was given their climbout restriction by Wittering TOWER. After calling DEPS they were identified, placed under RAS, instructed to climb to FL60 and traffic information on the T10 passed. The GR7s headed towards the T10 and 'busted' their assigned level of FL60, but neither controller had time to intervene. The GR7's Mode C was observed at FL65 then FL71, with a horizontal proximity of 2nm.

[UKAB Note (2): Analysis of the Claxby Radar video recording shows the T10 in the TACAN hold to the NE of Wittering maintaining FL71 Mode C (1013mb). The GR7 pair climb into recorded radar coverage and are shown passing 2400ft Mode C (1013mb) at 1036:05. The T10 heads SW toward Wittering as the GR7 pair climb rapidly towards it in a wide L turn, passing through the T10's level moments before 1036:46, when the pair are shown 200ft above the T10 at a range of 3.3nm. The subject ac converge and minimum horizontal separation of 0.88nm is shown at 1037:02 (about 7½nm NE of Wittering) as the pair climb through FL86, some 1500ft above the T10, still level at FL71.]

MIL ATC OPS reports that the Cottesmore RT transcripts, which also includes Wittering APPROACH that is situated within the Cottesmore RAR, are about 2min ahead of the radar recording therefore all timings in this report have been adjusted to UTC.

The pair of Harrier GR7s was scheduled for an IFR departure from RW05 at Wittering. Consequently, Cottesmore DEPS contacted Wittering GROUND (GND) by landline at 1027:26, to impose a climbout restriction on the departing Harrier GR7 pair of FL60, against a Harrier T10 that was in the TACAN hold at FL70 working APP. This climbout restriction was read back correctly by GND, and at 1029:50, Wittering TOWER passed the climbout restriction to the GR7 crews, including their clearance to take off. But at their request the climbout restriction was repeated by TOWER, "*Climbout restriction not above FL 60*". The GR7 leader read back "*not above 60, take off [C/S]*" and at 1030:06, the pair was released to call 'Stud 3' [DEPS] whilst on the runway. At 1035:45, the GR7 crews duly called DEPS, "*...through 1000ft request Radar Advisory Service*", who confirmed that they were identified at about 1035:52 and advised "*...climb report FL60 radar advisory when passing 1300ft QFE*", whereupon the GR7 leader advised that they were climbing "*through 2500ft*". Traffic information was then passed on the co-ordinated T10 traffic by DEPS at 1036:06, "*co-ordinated traffic north east 5 miles similar type at FL70*", which was acknowledged by the GR7 leader. At 1036:40, DEPS endeavoured to instruct the GR7s to "*....stop climb flight level six zer.....*" however this call was broken off to be followed 5sec later by DEPS advising the GR7 crews "*....previously reported traffic was co-ordinated flight level 70 with you not above flight level 60 is now east 1 mile tracking west indicating 1000ft below*". The GR7 pilot apologised and continued their climb through FL90 for FL240, followed by a handover to London MILITARY.

Meanwhile the T10 had been handed to APP, at FL70 for the TACAN hold. APP advised the crew that they were *"....identified FL70 radar advisory"* and instructed to *"...report established in the hold"*. At 1030:17, APP also restricted the T10 crew *"....not below FL70 in the TACAN hold departing traffic from Wittering very shortly not above FL60 co-ordinated"*, which the crew read back correctly. The T10 crew reported at 1033:06, that they were *"established in the hold FL70"*, but requested lower, *"just confirm if that pair's got airborne yet so we can go below 60?"*. APP instructed the T10 crew to maintain FL70 for the procedure, keeping them informed of the co-ordinated departing GR7 pair that was *"believed to be rolling shortly"* and at 1035:27 advised, *"...once you're clear of that traffic I'll give you further descent"*. At 1035:52, traffic information was passed on the GR7 pair, *"...traffic south west 7 miles northbound co-ordinated not above FL60"*. The GR7 pair was recalled to the T10 crew at 1036:30, at a range of 3nm northbound and 11 sec later APP advised the T10 crew that *"....the er previously reported traffic climbed through FL75 now indicating above"* to which the T10 crew reported visual with the GR7 pair. After a short interchange about the incident the T10 crew were cleared for the procedure at 1037:50, and made their approach without further incident.

HQ STC comments that safety was always on the mind of the GR7 staff instructor through the attempted communication and coordination with the T10. However, a contract had been set between the GR7 and ATC in their acceptance of a RAS. To accept RAS and then coordinate 'in-house' with the T10 without communicating to ATC was exceptionally poor judgment. There was always a chance that ATC had effected coordination with another aircraft unknown to the GR7s and had imposed a climb-out restriction for this. The ramification of this could have been very serious. If the GR7 wanted to continue to climb through the capped level then they should have talked to ATC and if necessary downgraded to a less restrictive service.

STC note that the ATCO initiated this report. It is pleasing to see that they have done this so all aviators and ATCOs can learn from this Airprox in an attempt to identify this potential pitfall.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Mil ATC Ops advisor emphasised that the ATC team had worked together to engineer standard separation between the departing GR7 pair and the T10. DEPS was seeking to maintain co-ordinated separation of either 3nm or 1000ft below the T10, which was not subsequently achieved. The controller had endeavoured to stop the GR7's climb after the pair had climbed through their assigned and co-ordinated level of FL60, but their rate of climb prevented this and unavoidably the instruction was too late. Therefore, when the GR7 pair was seen to be climbing up, above the T10, DEPS rightly approved a further climb. APP passed traffic information as soon as the GR7s were observed above their assigned and co-ordinated level, however, as they had already climbed through the T10's level, still climbing, no avoiding action was needed.

The Board recognised that ATC had endeavoured to provide the appropriate level of ATS between the subject ac through sound forward planning and co-ordination under the RAS that the GR7 pilots had themselves requested. Whilst instructions outwith the MATZ are not mandatory and the radar service here was 'advisory' in nature, there is a clear compunction on pilots to inform ATC if they intend to change level or heading beforehand under a RAS and an expectation by controllers that pilots will comply with the ATC instructions issued. This was clearly not the case here. According to the student leader, the GR7 pilots climbed through their assigned level of FL60, because he forgot to stop off. But with traffic information from TOWER before take off highlighting the reason for the stop and again the stop reiterated by DEPS with the addition of information about the T10 once airborne, some members found this explanation difficult to reconcile. It should have been within the capacity of the student GR7

AIRPROX REPORT No 168/03

leader to retain the air picture. Pressing further, members queried where the command responsibilities lay within the GR7 formation; the STC fast-jet member explained that the student's instructor, although flying as wingman, was in effect responsible for the pair. He should therefore have ensured that his student complied with ATC instructions by calling him to stop the climb. Instead he apparently established radio contact with the T10 instructor on another frequency, and informed him of the developing situation and in so doing effectively cut ATC out of the loop. The Board endorsed the Command's view, that the instructor had exercised poor judgement and that it had been a very unprofessional action to climb through the level restriction without first informing DEPS. There could well have been other traffic in the vicinity of the pair or above the T10, which the GR7 pilots were not aware of. On a slightly different tack, it seemed inconceivable to some members that sufficient time existed for the staff instructor pilot to be able to co-ordinate independently with the T10 instructor. The time interval between realising that the rate of climb would take the pair through their assigned level and actually passing FL60 was minimal; the radar recording showed the pair took just 8 secs to climb between FL54 and FL64 and a further 8 secs to pass FL73. No RT transcript was provided for this frequency, nonetheless, both pilots' reports indicated that co-ordination had been accomplished between themselves. However, leaving ATC 'out of the loop' demonstrated poor airmanship. The Board concluded unanimously that this Airprox had resulted because the No2 GR7 instructor pilot allowed his student to climb through their assigned level. It was indeed fortunate that the solid overcast dissipated and permitted both pilots to spot each other's ac in between the cloud layers. This, and the separation afforded while both instructors were apparently aware of each other's intentions convinced members that no risk of a collision had existed in these circumstances.

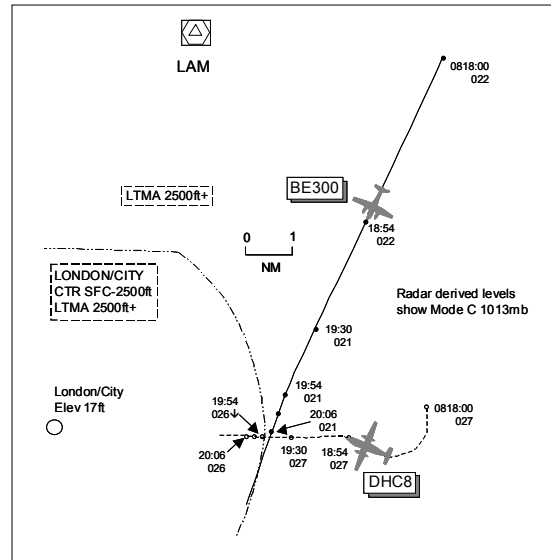
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The GR7 instructor pilot (No2) allowed his student to climb through their assigned level.

Degree of Risk: C.

AIRPROX REPORT NO 169/03

Date/Time: 25 Oct 0820 (Saturday)
Position: 5130N 0009E (5nm E London/City Airport - elev 17ft)
Airspace: LTMA/FIR (Class: A/G)
Reporting Ac Reported Ac
Type: DHC8 BE300
Operator: CAT Civ Pte
Alt/FL: 3000ft↓ 2400ft
 (QNH 1024mb) (QNH)
Weather VMC CLOC VMC CLOC
Visibility: NK NK
Reported Separation:
 400ft V NK H 500ft V 1nm H
Recorded Separation:
 500ft V 0.6nm H

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

THE DHC8 PILOT reports inbound to London/City on approach to RW28 at 150kt and 3000ft QNH and he had just been transferred to City TOWER from Thames RADAR. He noticed a TCAS image close by and, on starting descent on the ILS GP, an RA warning of “*monitor vertical speed*” was received demanding level flight. The conflicting traffic was indicating -400ft and by the time the TCAS warning ceased, the ac was positioned well above the G/P. Upon querying this traffic with TOWER he was told to ‘standby’ but then ADC informed him that the other ac was working another ATSU and had reported his ac in sight and had passed behind. He opined that better coordination between ATSUs to advise of the traffic would have been useful and at the time a caution light was on adding to the workload.

THE BE300 PILOT reports heading southerly at 240kt and 2400ft QNH en route from Norwich to Blackbushe and in receipt of a RIS from Thames RADAR on 132.7MHz squawking 7066 with Mode C. He requested a direct routing to OCK and was advised of traffic shortly to intercept the London/City ILS and when visual with this ac, he was cleared to pass behind before turning towards OCK. The DHC8 was seen on the ILS and his flight path took his ac about 1nm behind and 500ft below the City inbound. No risk was perceived and the flight continued to Blackbushe.

ATSI reports that the DHC8 was inbound to London City and established communication with the Thames Radar controller at 0814:20. The crew reported leaving LAM heading 140° and were instructed to maintain 4000ft on reaching. Shortly afterwards the crew were instructed to descend to 3000ft and vectored towards the ILS LLZ for RW28.

The DHC8 crew reported established on the LLZ at 0818, at a range of 8nm from touchdown, and were instructed to descend on the ILS. At 0818:20 the subject BE300 pilot contacted the Thames Radar controller tracking SW and routeing initially to the E of the London City CTR, having been transferred by Stansted, reporting level at 2400ft and was placed under a RIS. The Thames Radar controller passed TI on the DHC8, which was, at 0818:50, S of the BE300 at a range of 5nm. The crew of the BE300 reported the DHC8 in sight and, shortly afterwards, requested to route direct to Ockham. The controller replied that once the BE300 had passed behind the DHC8 this routeing should be possible. Immediately afterwards, the Thames Radar controller instructed the DHC8 pilot to contact London City Tower.

AIRPROX REPORT No 169/03

STCA activated but the DHC8 was at 3000ft within the London TMA and the BE300 was at 2400ft below the TMA and in Class G airspace. This meant that the two ac were deemed separated (MATS Part 1 Section 1 Chapter 5 page 11, para 12.1.4) as one was within CAS and the other remaining outside. The Thames Radar controller had not passed the DHC8 crew TI on the BE300, the rationale being that the Beech would be passing behind and so out of sight of the DHC8 crew.

The DHC8 pilot established contact with the London City ADC at 0819:30, and was told to continue approach. Approximately 30sec later the crew reported unable to descend owing to traffic, observed on TCAS, directly beneath. This was the BE300, still maintaining 2400ft and passing 0.6nm behind the DHC8.

The London City ADC immediately contacted Thames Radar, by telephone, to establish what the traffic was and the controller passed the details. These were relayed to the DHC8 crew whose reply was "*Thanks for telling us*".

Although a prescribed separation was not infringed the DHC8 crew were clearly concerned owing to their TCAS indications. It is unfortunate that the Thames Radar controller did not pay greater regard to the TCAS implications of the encounter and clearly, with the benefit of hindsight, it would have been prudent for him to have passed TI to the DHC8 crew, even though this is not specifically required under current arrangements. It might also have been a good idea to retain the DHC8 on frequency until the flights had passed, however, it is accepted that the controller was correct in assessing that the BE300 did not pose any actual risk to the DHC8 and that, in all probability, the DHC8 crew would not have seen the traffic and, in the absence of TCAS, would not even have been aware of its presence.

UKAB Note (1): The Pease Pottage recorded radar at 0818:00 shows the DHC8 turning R through 180° onto the ILS at FL027 (3030ft QNH 1024mb) with the BE300 7.5nm to its N tracking 205° indicating FL022 (2530ft QNH). At 0819:54 the DHC8 is seen to commence descent on the ILS indicating FL026 (2930ft QNH) having passed through the BE300's 12 o'clock position range 1nm which is maintaining FL021 (2430ft QNH). The DHC8 then maintains FL026 as the BE300 passes behind by 0.6nm and 500ft below, the CPA occurring just after 0820:06.

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 the circumstances leading to this incident were slightly unusual. Unlike the BE300 that was flying outside CAS and flying below the LTMA, the DHC8 was inside CAS within the LTMA and about to enter the City CTR for a descent on the ILS. The Thames controller had passed TI to the Beech pilot who had seen the DHC8 ac 5nm ahead and had been told that it would be descending on the ILS. The controller added that after passing behind it, a direct routeing to OCK would be possible. Owing to the speed differential, the BE300 had caught up the DHC8 but the Beech pilot had assessed that his ac would pass behind and below the DHC8, which it did and which was deemed separated by existing procedures. Meanwhile, the DHC8 pilot had been unaware of these control plans when transferred to London/City TOWER. With no TI on the Beech he was understandably concerned subsequently when, on commencing descent on the ILS GP, TCAS gave an RA warning. From his viewpoint, the 'conflicting ac' appeared to be displayed beneath his ac by 400ft. In complying with the RA the DHC8 had levelled-off and this had placed the crew in an unenviable position. They were then above what was normally a steep approach path in normal circumstances, making GP capture even more difficult once the 'clear of conflict' had been received. Pilot members believed that even with the benefit of TI on the Beech, the DHC8 crew would probably not have visually acquired it and would have had to comply with the TCAS guidance anyway. Unknown to the DHC8 pilot, the Beech pilot was maintaining visual separation from

his ac, passing more than 0.5nm behind and 500ft below. However, with the benefit of seeing all the information gathered and mindful of the TCAS element from the DHC8 crew's perspective, the Board agreed that this had been a sighting report on TCAS as the BE300's flight path passed clear behind the DHC8. The tracks flown had rendered this encounter benign, during which there had never been any risk of collision.

PART C: ASSESSMENT OF CAUSE AND RISK

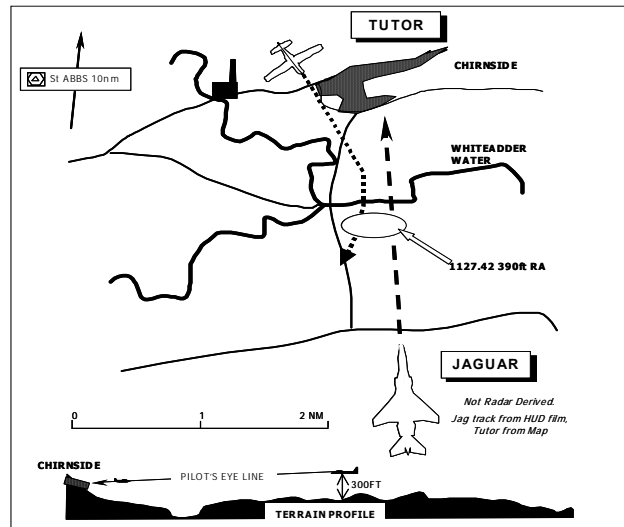
Cause: Sighting report (TCAS).

Degree of Risk: C.

AIRPROX REPORT No 170/03

AIRPROX REPORT NO 170/03

Date/Time: 3 Nov 1130
Position: 5544 N 00210 W 10nm S St Abbs Head
Airspace: UKDLFS LFA 16 (Class: G)
Reporting Ac Reported Ac
Type: Tutor Jaguar TMK4
Operator: HQ PTC HQ STC
Alt/FL: 500ft 400ft
(RPS 985 mb) (Rad Alt)
Weather VMC Below CI VMC
Visibility: 30km >10km
Reported Separation:
500ft H 0 V 300ft 0 V
Recorded Separation:
NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE TUTOR PILOT reports flying a white Tutor ac with another QFI in the other seat. They were operating and in communication with a formation of 3xF3s on a tactical mission in the LFAs 12 and 16. At the time of the incident they were 10nm S of St Abbs Head acting as a single target for a formation of F3s and were flying a N/S racetrack. The ac was not fitted with TCAS but nav lights and HISLs were selected on and they were squawking 7001C. While they were steady on a heading of 160°, into the sun, at 120kt, the F3s were positioning to track them; suddenly the non-operating pilot took control of the ac and executed an evasive manoeuvre to the right. He had sighted another ac on their nose, at the same height, and on a reciprocal heading at a distance of under 1000m. The captain then resumed control to manoeuvre the ac out of a collision path. A fast-jet passed down the left hand side of their ac with no change to its flight path. They assessed that had they not taken the avoiding action, the ac may have collided and therefore assessed the risk as very high.

THE JAGUAR TMK4 PILOT reports flying one of 3 grey Jaguar ac on an OCU 2v1 tactical evasion training sortie in the UKLFS with a student in the rear seat. The Leader and No2 were acting as a low-level battle pair and he was acting as the aggressor. At the time of the Airprox, Leader and No2 had just attacked a simulated ground target and were approximately 10nm apart approaching the pre-planned rejoin point and he was not in their immediate vicinity. The first indication that he had come close to another ac was when both pilots saw a light ac pass down their left side, co-height, plan-form and approximately 300ft away. The Tutor had already passed the Jaguar before either pilot was able to take any evasive action and he assessed that there had been an actual risk of collision.

Subsequent analysis of the HUD video tape showed the Tutor approach the Jaguar almost head-on from the NW 100-150ft lower in a shallow valley. The Tutor pilot initiated a hard climbing turn to the right and passed down their left side. The Tutor was painted white and could not be broken out on the HUD videotape until it had commenced its breakaway manoeuvre.

UKAB Note (1): The provision of the Jaguar HUD tape was a key element in the analysis of this incident. A frame by frame inspection of the colour HUD tape taking over 3 hours showed the white Tutor first appearing out of the similarly coloured background of the town of Chirnside, 2sec before it passed down the left side of the Jaguar. At no time during the period before this can the Tutor be seen either on freeze frame, slow motion or at real time. Accepting that the ac was near head-on and its aspect presented a

very small target, there is no doubt that the lack of relative motion and the poor conspicuity of the Tutor were major factors that prevented acquisition in this incident. The combined closing speed was about 570kt or 1nm every 6sec. (i.e. the Tutor (non-handling) pilot had about 4sec to react and manoeuvre the ac sufficiently to change his flight path thus ensuring that the ac did not collide).

UKAB Note (2): Further analysis of the HUD video shows that the Jaguar would have first achieved line of sight with the Tutor (based on its predicted position) at 1126:05, some 1min 37sec before the incident. In these circumstances with both ac squawking with Mode C, and with both flying steady tracks in rolling terrain, CWS would have warned both pilots of the presence of the other ac at that time.

THE JAGUAR PILOT'S STATION comments that the Jaguar pilot has honestly reported that neither he, nor his student, saw the Tutor until it had passed down the left-hand side of their ac, therefore no avoiding action was taken. The HUD recording would appear to indicate a late sighting by the Tutor but notwithstanding this, the Tutor pilot took avoiding action that clearly prevented a far more serious incident from occurring.

Whilst this Airprox is a prima facie case of see and avoid, the prevailing conditions on the day will always be a factor; in this case the Tutor would have been flying into sun. However, more pertinently, the Tutor merged with the background and was only seen on the subsequent HUD video following its pilot taking avoiding action. Much research has been carried out into making ac more visible by the use of high conspicuity colour schemes and high intensity strobe lighting; RAF flying training ac are painted in a black colour scheme for this very purpose. Although military operated, this civil registered ac is not painted in such a manner, and there is little doubt that this was a significant contributory factor in the generation of this incident. Assuming that there is a requirement for these ac to operate routinely in the UKLFS, then there is a concomitant requirement to ensure that appropriate measures are taken to make them as conspicuous as possible. For the see and avoid principle to remain coherent, you have to make every effort to be seen.

THE TUTOR PILOT'S STATION comments that this incident serves to underscore the generally poor conspicuity characteristics of most light ac. The issue of the Tutor's paint scheme has been raised before and a change to the more conspicuous black finish of our other training ac has been considered impractical. This topic should be revisited along with other 'add on' conspicuity devices that may have been developed for other users and ac types; devices such as reflective panels along the leading edges come to mind. Certainly lessons such as these must be taken forward into MFTS procurement arena.

HQ 1 EFTS comments that this Airprox was a close call and a collision was averted by the prompt actions of the non-handling Tutor pilot who was maintaining a good lookout. The Tutor was carrying out a fully briefed fighter affiliation exercise in good weather with 3xF3s. The Tutor had 2 pilots thus ensuring optimum lookout. In practice, for a head-on situation such as this, the colour is largely irrelevant since the Tutor's cross section is small and the ac difficult to see anyway even with the High Intensity Strobe Lights, navigation lights and landing lights all on as they were.

[See UKAB Note (1)]

It is noteworthy that the Jaguar was flying down sun and should have had a much better chance of seeing the Tutor, which was flying into sun.

HQ PTC comments that this was undoubtedly a very close call, saved from something worse only by the positive intervention of the PNF. The geometry of this encounter was the very worst to be able to detect visually and not helped by the Tutor's poor conspicuity. Whilst we accept that there is nothing that can be done substantially to enhance this, this is a bitter lesson that keeps manifesting itself, that we must not forget in the future. The case for fitting CWS in Tutor ac is self-evident, given this disadvantage. The protective effect for light ac generally is in any case already well founded.

AIRPROX REPORT No 170/03

HQ STC comments that the remarks of the two Stations are well made. We must continue to look for ways to enhance conspicuity, and must pursue as a matter of urgency a practical CWS for our ac. The head-on situation presents a very small aspect with little motion to aid acquisition. Fortunately the Tutor pilot's keen lookout prevented this close call becoming something worse.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac, radar photographs/video recordings, the Jaguar HUD Video and reports from the operating authority.

Members watched the HUD Video taken from the Jaguar ac that clearly shows the incident as described in Pt A above.

The Tutor was a very small target for the Jaguar pilot to acquire with almost no relative motion to assist until it broke right and critically it was below the skyline. From the other cockpit however the Jaguar would have been above the horizon for a short time before the incident and the crew did see it, albeit not as early as they might have. This again was mitigated by the non-existence of any relative motion to assist and the effective grey camouflage of the ac.

In assessing why the sightings from both cockpits had been late Members considered the conspicuity of both ac. In this case both ac blended in almost perfectly with the background. Although they accepted that in other circumstances ac colour may be a major factor, Members considered that in these particular circumstances the respective ac colour schemes had not been a factor and that high conspicuity colours or stick on devices would probably not have been effective. When viewed from the Jaguar cockpit, Members accepted that it was beyond the capability of the human eye to acquire the Tutor and only more sophisticated conspicuity or warning measures would have assisted. It is possible that a headlight such as that used in the Hawk TMk1 may have helped but, without question in these geometrical circumstances, some form of CWS would have provided the respective pilots with warning of each other's presence well over 1 min in advance allowing them plenty time to take evasive measures.

In this incident however, the second pilot in the Tutor saved the day and Members considered using two experienced pilots for such unusual activity in a light trainer to be very wise. Although not the handling pilot at the time, the second pilot's timely intervention (verified from the Jaguar HUD video) initiated an effective manoeuvre, just in sufficient time to prevent there being a risk of the ac colliding.

Members were informed that CinC STC had recently placed a very high priority on the fitting of Traffic Warning Systems to ac in his Command. Cost and integration problems however, meant that any equipment programme would not be swift.

PART C: ASSESSMENT OF CAUSE AND RISK

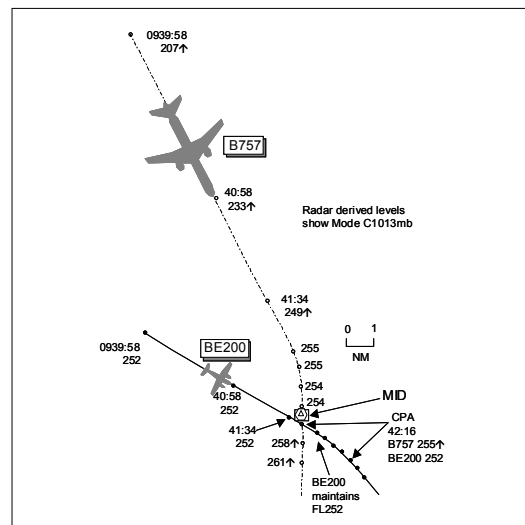
Cause: A non-sighting by the Jaguar pilot and a very late sighting by the Tutor crew.

Degree of Risk: B.

AIRPROX REPORT NO 171/03

Date/Time: 31 Oct 0942
Position: 5103N 0037W (MID)
Airspace: UAR UA34 (Class: B)
Reporter: LACC S18T

<u>First Ac</u>	<u>Second Ac</u>
<u>Type:</u> B757-200	BE200
<u>Operator:</u> CAT	Civ Comm
<u>Alt/FL:</u> FL250↑	FL250
<u>Weather:</u> IMC IICL	NK
<u>Visibility:</u> NK	NK
<u>Reported Separation:</u>	
not seen	not seen
<u>Recorded Separation:</u>	
300ft V 2.4nm H	

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

THE LACC S18 TACTICAL CONTROLLER (S18T) reports that the traffic loading was medium with some ac requesting weather avoidance. The slow moving BE200 checked in on frequency at FL250 on its own navigation to MID. The B757, which was outbound from Luton towards the MID area, had been coordinated into the Sector to FL210 from LTCC Capital and the S18 Planner (S18P) had correctly annotated the strip to show that further climb was permitted with S25 to FL300 subject to known traffic (the BE200). Despite indications (ac type on the strip and the radar trails showing a speed differential), he climbed the B757 straight up to FL300 without building in any separation against the BE200. Turning his attention briefly to other ac on the Sector - some weather avoidance and re-route issues - he then became aware that the B757 was 'chasing down' the BE200 from behind at a similar level. An avoiding action R turn was given to the B757, away from the BE200, but the initial stop-off level of FL250 was found to be wholly inappropriate, so he continued the B757's climb to increase separation. Once the situation was resolved, the B757 was released on its own navigation. He thought that this had been a simple cognitive error, as he had not fully appreciated the fast 'catch up' speed of the Boeing behind the Beech and had not built in any separation. The strips had been marked correctly by the Planner and, with the other slight distractions of other sector traffic, he may have been lulled into a false sense of security with the effected coordination out of the Sector on the B757 but he should have been aware of the BE200, which was known traffic.

THE B757 PILOT reports heading 160° at 350kt on a positioning flight to Spain and in receipt of a RCS from London. Near to MID during the en route climb phase, with a good ROC owing to there being no passengers onboard, and approaching FL250 climbing to a higher level, the controller said "avoiding action turn right heading 195, stop climb FL250". He, the Capt and PF, immediately disconnected the A/P and complied with the instructions. The ac's climb was arrested at FL254 before returning to FL250 and the ac was established on the new heading within a few seconds. Shortly after this, clearance was given to continue climb and resume own navigation. No TCAS alerts/warnings were received and the controller admitted to making an error. At the time the weather was technically IMC, flying in and out of cloud, but the visibility was good clear of cloud. At no time was any conflicting ac seen visually.

THE BE200 PILOT reports that he was unaware of any incident until contacted by UKAB. From his Pilot's Log (PLOG), at the time he had been cruising at FL250 en route to France and was passing MID routing to XAMAB. He had not received any avoiding action from ATC and was not aware of any collision risk as the ac was not TCAS equipped.

AIRPROX REPORT No 171/03

ATSI reports that the S18T described his workload as light to moderate at the time of the Airprox. He commented that he had been in position on the sector for about 30min prior to the incident, for most of that time operating as mentor to an experienced trainee. However, just before the event, the trainee had been taken off the sector to perform another task. Although, as was his usual method of operation, the mentor ensured he received a handover from the trainee, he admitted that he might not have been 'up to speed' when the Airprox occurred a few minutes later.

The B757 pilot established communication with the S18T at 0939, reporting reaching FL210, a level agreed between the S18P and TC Capital. The paper flight strip (PFS) for this flight showed that the B757 had been coordinated by the Planner, with S25, for a climb to FL300. Consequently, in responding to the B757 pilot's initial call, the S18T instructed the flight to climb to the coordinated level of FL300. However, this clearance did not take into account the presence of the BE200 at FL250. At 0939:55, as the B757 pilot makes his first call, the subject ac on conflicting tracks, the B757 is passing FL207, 11.4nm N of the BE200, whose Mode C is showing FL252. At the time, the BE200 had not contacted the sector but the S18T admitted that it would have been visible on the radar display and its PFS was in position in the same Veule designator bay as that for the B757, albeit not directly adjacent to it.

Less than 20sec after the B757 had been cleared to climb to FL300, the BE200 pilot contacted the sector, reporting maintaining FL250 to MID. Because the ac's Mode C was still indicating FL252, the controller asked for, and received, confirmation from its pilot that he was maintaining FL250. This is within the parameters for verification of Mode C (MATS Part 2, Section 1, Chapter 5, Page 10). The controller commented that, inexplicably, he still did not realise the potential confliction between the subject ac and turned his attention to the busier traffic situation to the S of the sector.

The S18T said that he became aware of the confliction between the 2 ac following a routine scan of the radar display, just prior to STCA activating. At the time (0941:34), the ac were about 4.7nm apart, with the B757 approaching FL250 and the BE200 still showing a Mode C readout of FL252. His immediate reaction was to stop the B757's climb at FL250 and issue an avoiding action R turn heading 195°. This was followed by information on traffic 3nm away. Almost instantly, realising that the B757 had climbed through FL250, the Tactical Controller instructed it to climb to FL300. No instructions or TI were passed to the pilot of the BE200, as the controller reasoned that the conflicting traffic was behind the ac, and the situation was being resolved by the instructions issued to the B757 crew. The radar shows that the B757 reached FL255 before maintaining FL254 for a short time, when it was given climb to FL300. The avoiding action turn is seen to take effect as the closest point of approach (0942:16) was 2.4nm, by which time the vertical separation was 300ft. The BE200 maintains FL252 throughout.

The S18T could offer no definitive reason for overlooking the potential confliction between the subject ac. He commented, whilst agreeing that it was not a requirement for the Planner, having co-ordinated climb for the B757, to warn him about the presence of the BE200, as it was known traffic, had he done so it would have removed the possibility of him overlooking it. Additionally, he believed that the relative slow cruising speed of the BE200, compared with the B757 (filed as TAS 247kt and 466kt respectively) might have been a factor, as the distance between them declined rapidly. He accepted that the remedial action, i.e. stopping the climb of the B757 at the same level as the BE200 was not appropriate. He explained that he based this decision on a quick 'snapshot' of the radar display at the time. He had observed the BE200's Mode C showing FL252 and inexplicably believed it was climbing, although it had been constantly showing that level whilst working the sector. In the event, had he instructed the B757 to expedite its climb through FL260, the situation would have been resolved comparatively quickly, as the ac had been climbing at about 3000fpm prior to it being instructed to level off.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members wondered why the S18T did not take the BE200 into account when he instructed the B757 to climb as this had caused the Airprox. Although he had been Mentor to an experienced trainee prior to the incident, at the time he was ultimately responsible for the Tactical position on the Sector and should have been fully aware of the traffic picture throughout. Although the BE200 was not on frequency when the controller told the B757 crew to climb, the BE200 was known traffic; its PFS was in the appropriate position and it would have been showing on the radar display. One theory offered was that the climb instruction may have been a 'reflex' response to the B757 pilot's call, as the exit coordination had been effected by the S18P out of the Sector at FL300, allowing the S18T time to concentrate on the busier traffic situation elsewhere. Shortly afterwards, the BE200 pilot made his initial call on frequency which ATCOs thought should have acted as a trigger for the SC to recheck the traffic situation. As he had reported, the speed differential should have been apparent from both the radar display and from the PFS data but at the time he had not assimilated this vital information. He had subsequently noticed the potential confliction, immediately prior to STCA activating. Although the avoiding action given - 'stopping off' at the same level as the BE200 - had been far from ideal, the S18T had also given the B757 crew a R turn onto a heading to take it behind the Beech. Then on noticing that the B757 had climbed above FL250, he had given its crew instructions to climb to FL300. The recorded radar had shown the B757 stopping climb and maintaining FL254 before recommencing its climb by which time the turn had taken effect with the B757 passing 2.4nm behind and 300ft above the Beech. The B757 crew had reacted with commendable promptness to the controller's instructions, being previously unaware of the potential confliction from TCAS, and without seeing the BE200. For his part the BE200 pilot had similarly not been aware of the B757's presence. When looked at in isolation, these elements appeared untidy but their combined effects were enough in the end to persuade the Board that any risk of collision had been effectively removed.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The S18T did not take the BE200 into account when he instructed the B757 to climb.

Degree of Risk: C.

AIRPROX REPORT No 172/03

AIRPROX REPORT NO 172/03

Date/Time: 28 Oct 1306

Position: 5053N 0355W (3½nm NE of DIDEL)

Airspace: London FIR (Class: G)

Reporting Ac Reported Ac

Type: ATR42-300 SHAR FA2 pair

Operator: CAT HQ STC

Alt/FL: FL170 16000ft

(SAS) RPS (1009mb)

Weather VMC CLBL VMC

Visibility: 20nm 10km

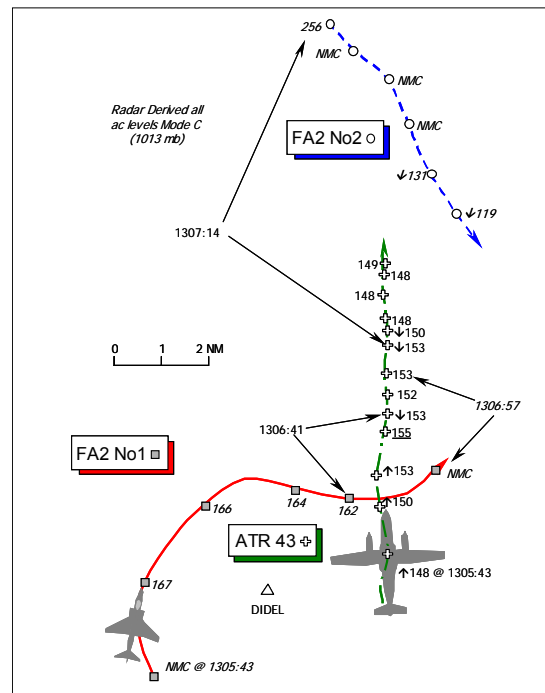
Reported Separation:

Not seen [he thought] Not seen

Recorded Separation:

ATR 43 v FA2 No1: 2nm H - 900ft

ATR 43 v FA2 No2: 2.3nm H - 1700ft



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE ATR42-300 (ATR43) PILOT reports his ac as a red & white livery and the HISL was on whilst flying outbound from Plymouth to Dublin. They were flying IFR, in level cruise at FL170, but VMC prevailed with a visibility of 20nm, some 2000ft below cloud in between layers. LATCC (Mil) was providing a RIS initially later upgraded to a RAS [but after the Airprox] on 135.35MHz and they were squawking the assigned code of A3762 with Mode C; TCAS is fitted.

About 52nm S of AMMAN, heading 350° at 210kt, two contacts appeared on TCAS as climbing from below his ac to the W. This rapidly became a TA before TCAS enunciated an RA “DESCEND - TRAFFIC - DESCEND”, which was complied with. The other ac were not acquired visually, he thought, but he believed from TCAS that they passed about 2½nm away to port as they passed through his level. He assessed the risk as “medium”. He did not report an Airprox on RT at the time to LATCC (Mil).

THE SEA HARRIER FA2 (SHAR) PILOT reports that he was flying as the No1 of a pair of SHAR ac, conducting a ‘1v1’ practice intercept (PI) sortie under an ADIS from the Royal Naval School of Fighter Control (RNSFC) fighter director (D) on 259.8MHz and squawking the assigned code of A1714 with Mode C. Neither TCAS nor any other form of CWS was fitted. He was flying in VMC some 4000ft clear of cloud with an in flight visibility of 10km ‘out of sun’.

Whilst descending during a high workload phase of the sortie, traffic information on a ‘stranger’ was called to him by the ‘D’ - E of his location heading N - at FL155 climbing. His AI radar was not working properly during this sortie, and although having subsequently reviewed his sortie tape the call was clearly addressed to him on RT as the No1 he did not respond, believing at the time the call was for the No2. Flying at 16000ft ALT (1009mb) eastbound at 500kt he started a L turn [more probably a R turn] to ‘recommit’ onto the No2 SHAR. During this re-commit he elected to descend rapidly below FL155, as he was within 15nm of the No2 and did not want the ‘stranger’ – the ATR43 - to become a factor. During this descending L [it was actually a R turn] turn the stranger passed 3nm to the S [it was actually N] but he did not see it and no other calls were made to him about it by the fighter controller, he thought.

He was not aware that an Airprox had been filed until two weeks afterwards; he believed that the risk was “none” as he was already descending and was below the other ac’s level when it was called.

THE RNSFC FIGHTER DIRECTOR (D) reports that the SHAR pair was operating W of A25 in a large block from 250ft agl – FL350 conducting an air defence training sortie under an ADIS – equating to a RIS in the MAS. During the second practice intercept (PI) on each other he called the London MILITARY traffic – the ATR43 - into both SHAR pilots using a tactical reference point (which had been checked and was accurate). As the SHARs approached the ‘merge’ point he called the conflicting traffic again in a range and bearing format to each of his ac at 11nm [actually 9nm range for the No1]. He called the conflicting traffic in for the 3rd time when they were about 5nm away from the ATR43 and once again at 3nm. He recalls one of his ac calling visual with the airliner [the No2], but he did not recall if the other SHAR called AI radar or visual contact with London Mil traffic. When the run was terminated and both SHARs ‘split out’ for another PI the pilots asked him where the previous stranger was, whereupon he informed them that the other ac was now clear to the NE. They repositioned themselves for the next run away from the confliction [after the reported incident] during which he received a call from the London Mil controller requesting co-ordination. He asked if the SHAR pilots were happy to take co-ordination under the RIS, but they refused, therefore, co-ordination was not achievable.

[UKAB Note (1): Analysis of the RNSFC landline & RT transcript reveals that the transcript timings are about 1min 50sec behind the radar recording timebase, therefore all timings within this report have been correlated to that of the radar recording – UTC. LATCC Mil Asst 31 was passed an ‘ident’ and general traffic information about the SHAR pair operating to the W of A25 by the ‘D’ at 1301:47. Traffic information about the ATR43 was passed by the D to the No1 FA2 pilot at 1304:45, “...stranger bearing 040° 9 [nm] heads north indicates FL140”, but was not acknowledged. The No1 SHAR was again given information about the ATR43 at 1306:20, “...previous stranger nose 5 [nm] heads north FL155 climbing”, which the No1 acknowledged “copied”. The No2 was issued traffic information a little while later at 1306:43, “...same stranger...bearing 150° 11 [nm] heads north indicates FL152”, which the pilot acknowledged. This was updated to the No2 at 1307:30, “...previous stranger ...south 5 [nm] FL150”, to which the pilot immediately reported “tally”, followed by another call at 1308:25, when the ATR43 was reported to be “...north 3 [nm] 15 thousand”.]

MIL ATC OPS reports that the ATR43 was northbound from Plymouth to join CAS at AMMAN climbing to FL170 under a RIS with LATCC (Mil) Controller 31 (CON 31). The ATR43 crew was instructed to route direct to AMMAN and traffic information was passed on the No1 SHAR at 1306:06, “...traffic left 9 o'clock 4 miles crossing left right indicating FL165 descending”. This was acknowledged by the ATR43 crew who advised CON 31 that they had “...just picked him up on a TCAS looking out good vision at the moment we'll call you if we see anything...”. CON 31 called the traffic again at 1306:23, “...previously reported traffic left 9 o'clock 2 miles crossing left-right no height information”. However, CON 31 was advised by the ATR43 crew shortly afterwards at 1306:31 that they, “...just had a resolution advisory we're in a descent now...”. Further traffic information was passed on the No2 SHAR at 1307:35, on traffic “...12 o'clock 3 miles crossing left-right no height information” to which the ATR43 crew reported that they had “Okay we've got him visual looks like a fast jet just coming down the right side thanks”. CON 31 reports that the ATR43 pilot later advised him that he was intermittent IMC and the service was subsequently upgraded to a RAS.

The Burrington Radar recording shows the ATR43 transiting to the E of EGD 011 (Okehampton Range) in a steady climb. At 1305:30, the ATR43 is shown 2nm due E of DIDEL passing FL145, whilst the SHAR is 5nm to the SW indicating FL225 on a northerly heading. The SHAR's Mode C indication is then lost from radar, reappearing at FL167 some 4-6nm W of the ATR43 but now heading towards it.

[UKAB Note (2): The No1 SHAR FA2 is shown on the Burrington recording squawking A1714 in a R turn at 1305:43, some 5.3nm WSW of the ATR43, which is northbound climbing through FL148 Mode C (1013mb). The next sweep shows the No1 SHAR at FL167, before the jet turns eastward and descends slightly as the ATR43 ascends to FL155. At 1306:41, the No1 SHAR indicates FL162 some

AIRPROX REPORT No 172/03

900ft above and 2nm SSW of the airliner just before the jet passes astern of the ATR43, whereupon contact on the No1 fighter is lost after 1306:57. The ATR43 oscillates at FL152/3, before a descent is evident through FL150 Mode C after 1307:14, when the No2 SHAR enters the frame from the N and is shown at FL256 in the UAS – over 10000ft above the airliner. The No2 SHAR descends rapidly through the level of the ATR43 to FL131 over 4 sweeps of the radar – a period of about 32sec – as the turboprop ‘bottoms out’ 1700ft above the jet at FL148 at a range of 2.3nm, before climbing once more. The No2 is shown 3000ft below the airliner at FL119 as the latter climbs through FL149.]

It is apparent that CON 31 provided timely traffic information under the terms of a RIS on both conflicting ac. Why level information was not included on the second call about the No1 is not known as Mode C seems to have been evident, however, this is a minor criticism as both calls, ‘painted’ an adequate ‘picture’ of the situation to the ATR43 crew as did the call about the No2. When subsequently advised of the deteriorating weather conditions the ATR43 pilot was offered and accepted an upgrade of ATS, however, this was after the Airprox had occurred. There appears to be no contributory Mil ATC aspects to this Airprox.

THE SHAR FA2 PILOT’S UNIT comments that this would appear to be a conflict in the FIR where the No1 SHAR, engaged in a Practice Intercept (PI) sortie and conducting high-energy manoeuvres, came into potential conflict with traffic climbing in the middle airspace. Although the No1 SHAR did not visually acquire the other traffic, he assimilated from the traffic information passed, that he needed to descend below the conflicting traffic before re-committing towards his playmate to complete the intercept. The No1 SHAR, as target ac, was manoeuvring in the vertical and horizontal plane in order to confuse the No2 SHAR pilot’s picture. One such manoeuvring turn, unknown to the No1 pilot, put him on a heading towards the conflicting traffic and the D, under the provision of the ADIS [RIS], rightly called traffic information at 5 miles range - on the nose. The No1 SHAR actually acknowledged the call and decided that the safest course of action was to descend rapidly clear of this ac - the ATR43 - in order to drag the ‘fight’ well below the FL155 reported level of conflicting ac, performing a R turn in the process. It is understood that the No1 SHAR remained at least 2nm from the conflicting traffic throughout the manoeuvre.

Neither the pilot nor ‘D’ were made aware of the Airprox until some 2 weeks later, the pilot’s report is therefore understandably confused and rather sketchy with regard to when the Airprox actually occurred and the manoeuvre he was conducting at the time. With the benefit of radar and voice replay, it can be seen that the No1 SHAR does execute a rapid descent and a R turn behind the conflicting traffic, shortly after receiving the traffic information that the pilot actually acknowledged. It is believed the L turn, described in the pilots report, is conducted when he was well below and to the E of the ATR43.

HQ STC comments that the low severity of this Airprox is probably why the event has not lodged in the SHAR pilot’s mind for recall some 2 weeks later. We wholly support the views of the SHAR Unit and add that separation in excess of 2nm astern would seem reasonable for safe operations in the vicinity of CAT in Class ‘G’ airspace. We would actively encourage a reduced distance astern in preference to a larger distance ahead as this is by far the safest option.

PART B: SUMMARY OF THE BOARD’S DISCUSSIONS

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

It was noted that there had been no verbal Airprox report filed on RT at all and it was not until the ATR43 pilot’s written report was received at the UKAB some 8 days after the event that this occurrence came to light. The Board implored pilots to make clear their intentions to file an Airprox on RT at the time to ensure that ATCOs were made aware of the situation. This sequence ensured that timely data gathering

actions would commence, allowing pilots and controllers alike the opportunity to compile their submissions promptly whilst events were still fresh in their minds. If then a pilot elected to withdraw the Airprox then nothing is lost. Here the time taken to trace the No1 SHAR pilot and obtain his report had clouded his recollection of events somewhat, which might not have been the case if he had been informed immediately after the sortie. It was evident that both pilots' memories were at odds with the facts reflected by the radar and RT recordings – this was not a criticism more a statement of fact and CAT pilot members understood that it would have been very difficult to recall with accuracy a specific event within a busy day that might include multiple sectors. Similarly, the SHAR pilots would have undertaken many PIs during the sortie and it was extremely difficult to recall events with clarity so long afterwards.

From the ATR43 pilot's account he thought that both ac approached from the W, but the Mil ATC Ops report made it clear that the ATR43 crew had been passed comprehensive traffic information about the No1 SHAR approaching from the W, and the No2 which approached from the N under the RIS which the crew had requested. Clearly, this form of ATS only provides traffic information to crews and no form of separation is proffered, which remains entirely the responsibility of the crew. It seemed likely that it was the steep descent of the No2 ahead of the airliner, which triggered the TCAS RA as the jet descended out of the UAS. The descent below the airliner's level reported by the SHAR leader did not occur until after he had passed more than 2nm astern of the unseen airliner and was flying away to the NE of the turboprop. Although made aware of the ATR43 from the D's traffic information it was surprising to some that he had not seen it. The No2 meanwhile passed a little further away down the starboard side of the airliner at 2-3nm range and had probably descended through the ATR43's level some distance ahead of the ac. But it was not feasible to determine that with accuracy because of the lack of Mode C data at the critical point, suggesting a high RoD in excess of 10000ft/min – beyond the scope that Mode C/TCAS can cope with. Both pilots did however see each other's ac – the RT transcript revealing that the ATR43 pilot had reported seeing the jet to CON31 as it passed down the starboard side, probably below his ac. Thus the airliner crew was aware of both SHARs from traffic information provided by CON31 under the RIS, TCAS and a sighting of one of the jets. With a TCAS RA having been triggered the situation must have appeared uncomfortably close for the ATR43 crew, but the SHAR pilots had taken account of the airliner following the traffic information calls from the 'D' who had conscientiously provided a good radar service with many updates about the airliner. The end result was that neither of the jets passed within 2nm of the ATR43 in Class G airspace. After considering all these aspects carefully, the Board concluded that this Airprox had resulted from a sighting report of traffic passing clear, which the ATR43 crew had also been alerted to by TCAS, but there had been no risk of a collision in these circumstances.

Much discussion ensued about the ATR43 operator's rationale of flying this direct track from Plymouth through the 'Open FIR' to join CAS at AMMAN, when ALPHA 25 is situated just 15nm further East of the location of this Airprox. Airways are established purely for GAT, bring enhanced safety benefits and at face value there did not appear to be anything to prevent an earlier CAS join. Whilst recognising the legitimate right of the ATR43 operator so to do, civilian controller members were critical that they had elected to ignore the use of CAS and route this CAT flight through the 'Open FIR' instead. They believed it would have been far wiser to join CAS in the vicinity of DAWLY, providing quicker entry into the relative sanctuary of a Class A airway and reduce the potential for a recurrence of such incidents.

Post meeting Note: It became apparent after consideration of this Airprox, that CAT operators might be unaware of the wide spectrum of aviation activities conducted in this vicinity. This, coupled with the increased frequency of CAT flights by TCAS equipped ac through this area prompted a review of the advice available to operators in the civil UK AIP regarding RNSFC activities in this airspace. It has been observed, therefore, that a more comprehensive warning of the scope and extent of routine RNSFC training might be promulgated within appropriate sections of the UK AIP for the benefit of other airspace users.

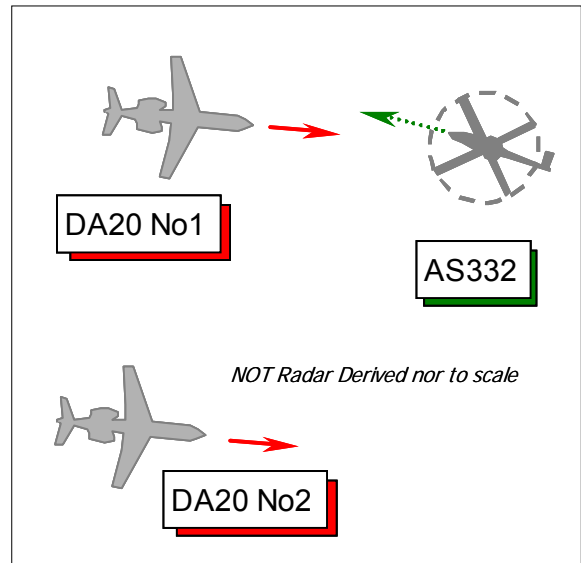
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Sighting Report.

Degree of Risk: C.

AIRPROX REPORT NO 173/03

Date/Time: 4 Nov 1523
Position: 5700N 0035E (105°(M) ADN VOR at 95nm d)
Airspace: HMR (Class: G)
Reporting Ac Reported Ac
Type: AS332 Falcon DA20
Operator: CAT Civ Comm [Mil Regs]
Alt/FL: 2000ft ↓300ft
(QNH 1020mb) (amsl)
Weather VMC CLBC VMC NR
Visibility: 8nm 10km+
Reported Separation:
nil H/200ft V 300m H/700-1000ft V
Recorded Separation:
NR

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

THE AS332 PILOT reports that his helicopter has a red/white & blue livery and the HISLs were on whilst inbound to Aberdeen some 2000ft below cloud, flying out of sun with an in-flight visibility of 8nm. They were in receipt of a FIS from Aberdeen OFFSHORE INFORMATION on 135.175MHz and squawking A7051 with Mode C, but neither TCAS nor any other form of CWS is fitted.

Flying at 125kt, heading 281°(M) along the 105°R ADN VOR at 95nm in level cruise at 2000ft FULMAR QNH (1020mb), a FALCON jet was suddenly spotted 5sec before it over flew his helicopter 200ft directly above them on a reciprocal heading. No avoiding action was taken - there was insufficient time – before the jet passed by with a “medium – high” risk of a collision.

He added that a training discussion in the cockpit between himself and his co-pilot resulted in a delay in setting, correctly, the Aberdeen QNH (1011mb) at 100nm DME range inbound. If it had been set at the appropriate point then he would have been flying 270ft higher and consequently separation would have been reduced still further.

THE FALCON DA20 PILOT reports he was operating under military regulations when flying as the left hand No1 of a pair of Falcon jets in wide battle formation with the No2 displaced 4-5nm on the starboard beam. The ac has a blue & white colour scheme and the HISLs were on whilst flying VFR with an in-flight visibility of 10km+ acting as a target for another unrelated military ac against which they were also conducting an EW exercise.

He was in receipt of an ADIS 5000 from Neatishead – effectively a RIS above 5000ft and a FIS below this altitude – squawking the assigned code with Mode C, but neither TCAS nor any other form of CWS is fitted. Heading E over the sea beneath the “eastern end of D613A” at 300kt they were descending to 300ft to set up for the attacker. As they descended through 2000ft the PNF sighted a helicopter about 4-5nm away ‘co-altitude’ on the nose. He called the ‘tally’ to the 1st Officer – the PF - who pulled up over the helicopter as he reported the sighting on the GCI frequency to his No 2 who also reported ‘tally’. They passed the helicopter ‘port to port’ about 300m away and 700-1000ft above the AS332, as they did so they dropped the left-hand wing to indicate to the AS332 crew that their helicopter had been seen. He assessed the risk of collision as “nil”.

AIRPROX REPORT No 173/03

THE ABERDEEN HELS AND REBROS SECTOR CONTROLLER reports that the AS332 was in the REBROS (Non Radar) sector outwith radar coverage in receipt of a FIS (Enhanced). Neatishead CRC Console 1 had earlier passed traffic information that 2 Falcons and 1 x F3 – squawking A2411/2 & 3 respectively - would be operating in and below D613B sfc – 23000ft ALT. Although no co-ordination had been effected, D613B was NOTAM'd active from 10000ft – 40000ft from 14–1600UTC.

At 1523, the AS332 pilot informed him that he wished to report an Airprox in position 106R ADN 95DME where a Falcon DA20 had passed 200ft overhead at high speed. Nothing was seen on radar, but shortly after the report, an A2412 squawk appeared nearby for 1 sweep indicating 3500ft Mode C, before contact was again lost from radar. An outbound helicopter was warned of the activity.

UKAB Note (1): This Airprox is reported to have occurred whilst the AS332 was on the 105R ADN 95nm DME and within the Helicopter Main Route (HMR) structure. This HMR is depicted within the civilian UK AIP at ENR 6-1-15-5 (30 Oct 03). The RAF FLIP En Route Supplement BINA also depicts this HMR correctly and entreats military pilots: *“Military operations near HMRs should normally be conducted at or below 1000ft amsl or above FL85 and with due regard for civilian helicopter operations when crossing HMRs”*. The correct structure is also shown on En-Route Charts (ERCs).

However the information current at Mil AIP at Vol III Sect 8 1-8-15 (9 Aug 99), does not depict this HMR and shows a gap in the structure between the 093°R - 111°Rs as does LFC 3 (2 Oct 2003). It would appear that the Mil AIP and LFC were not updated when this HMR structure changed before the Airprox occurred.

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

ATSI reports that the AS332 was being provided with a FIS (Enhanced), as it was operating outside radar cover at the time of the Airprox. The telephone call received from CRC Neatishead advising that operations would be taking place in D613B was initiated by the CRC assistant at 1347, saying *“I've just got some traffic information that might affect you in the next fifteen minutes”*, no other time information was mentioned whereas the Airprox occurred at 1523. Although the Falcon DA20 pilot reported the Airprox position as the *“eastern end of D613A”*, both D613A/B (Central MDA) when promulgated as active extend from 10,000 to 55,000ft ALT.

ASACS SSU comments that the DA20 pair was conducting an EW exercise against a single Tornado F3, within and underneath the confines of MDA D613B. These ac were in receipt of a RIS above 5000ft and a FIS below that altitude and the MDA had been booked for their use. The sortie was conducted in 2 phases, the first being at medium level; the second at low-level, which is when the Airprox occurred. On completion of the medium level phase the F3 descended to low-level for a weather check and reported back to the DA20s, who replied that they were happy to conduct the second phase initially at 3000ft with the inbound run being at 1000ft; the in-flight visibility was reported as 10km+ at low-level. At the time of the incident, 1523Z, all the aircraft were below 5000ft and therefore operating under a FIS. The aircrew were thus responsible for their safe separation from other ac. It is evident from the CRC Neatishead report and our own investigation that, at the time of the incident neither the DA20s nor the Super Puma were within radar coverage of the available NATS or ASACS radar sources. Neither the Weapons Controller nor the Fighter Allocator detected a conflict and were not aware that an incident had occurred until contacted by the Aberdeen Offshore SC. In a subsequent RT transmission the DA20 leader stated that he had seen the AS332 at a range of 5nm, had climbed to avoid the helicopter and also wagged his wings to acknowledge its 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, reports from the air traffic controllers involved and reports from the appropriate ATC and operating authorities.

The Board was concerned at the wisdom of conducting the F3 crew's training exercise at this location within the busy HMR structure without radar coverage. To plan a military training exercise through the area regularly flown by CAT helicopter traffic increased the risk of meeting one of these helicopters and here that is just what occurred. Helicopters transit, climb and descend along these routes in all weathers, however, this was Class G airspace and each crew had a legitimate right to operate here. Although conducting a 'military' training task as a civil registered ac (not a 'state' ac) the DA20 crews are bound by civilian regulations, but they do have access to military FLIPs. Whilst the military aircrew with whom the DA20 was participating was advised within RAF FLIPs to ensure that their sorties were "...normally..conducted at or below 1000ft amsl or above FL85 and with due regard for civilian helicopter operations when crossing HMRs", some might consider that this did not apply to the Falcon crew to the same degree, whereas in the Board's view as an issue of airmanship, it did. Members noted the paradox here; the DA20s were operating purely for the training benefit of the military F3 crew whose operating authority had authorised the exercise. Overriding all this, good airmanship dictated that due cognisance was taken of the HMR structure and many members were critical of the decision to conduct the exercise in the middle of the HMRs. Nevertheless, it was pointed out that the DA20s were descending under VFR in VMC through the HMR to operate at 300ft amsl beneath it - not operating within it – an important distinction.

Although CRC Neatishead had passed on some information to the ATSU controlling the HMRs this was evidently old information at the time that did not provide a satisfactory warning of the extent of the exercise being flown and better notification could have helped here. Moreover, this part of the sortie was executed below radar cover with little potential for a warning from either the CRC to the DA20 and F3s, or to the helicopter crew from Aberdeen ATC. Whether the exercise had been planned in the old HMR 'gap' using the out of date information contained within Vol III of the Mil AIP was unclear but the Board was reassured that amendment action had been taken as a result of the errors revealed by the investigation of this Airprox. Nevertheless, the Board had been advised that the DA20 crew had access to RAF ERCs, which did show the HMR structure correctly as did the civilian UK AIP. Allied to this topic the Board was briefed by the STC member that an extremely useful meeting had been held at Aberdeen Airport in early June between military and civil operators in this region, to gain a better understanding of each other's operations. [Post meeting note: The outcome of the "extremely useful" discussions suggested potential improvements to the co-ordination of military traffic in the region between Aberdeen ATC, CRC Buchan (and Boulmer when responsibility is transferred later this year). Furthermore, a need for greater education of both helicopter and military crews in each other's operations was identified and it was suggested that further liaison briefings and meetings between all 'players' would be arranged. From the MOD perspective this meeting demonstrated a clear commitment on both sides to reducing operating risks whilst minimising operational and training restrictions.]

In Class G airspace both crews had equal responsibility to look out and avoid other traffic by an appropriate margin. The Falcon DA20 PNF reports that he spotted the helicopter at 5nm and warned the PF who arrested the jet's descent in time to pass 300m port to port and 700-1000ft above the AS332, suggesting that he saw the helicopter in time and that these actions had been sufficient to resolve the confliction. Conversely, all this was initially unseen by the AS332 pilot, who, from his own report said that he only spotted the jet 5sec before it directly overflew his helicopter a mere 200ft above them. Unfortunately, the widely differing perception of the vertical separation that pertained here could not be resolved independently without radar data. But from the AS332 pilot's perspective this was a very late spot indeed and the head-on aspect, and blue/white colour scheme of the Falcon, although sky lined above him, had all conspired to mask the DA20's presence from the helicopter crew until the last

AIRPROX REPORT No 173/03

moment. Moreover this fleeting glance may have deceived him as the Falcon is a fairly large twinjet, a commercial helicopter pilot member suggested that the relative size of this ac at the rapid closing speed of 425kt may have startled the AS332 crew here to the point that they might have misjudged the separation – but this was only conjecture. A commercial pilot member thought that the observation by the Aberdeen controller of the A2412 squawk at 3500ft might have been significant. However, the ASACS adviser pointed out that though the DA20 pair was flying in formation this code was assigned to the No2, therefore this was not conclusive evidence of the separation that actually pertained between the helicopter and the No1 DA20 at all. Whereas the Falcon pilot may have had a longer view of the event, the Board was conscious that only the pilots involved had actually witnessed this occurrence and only they knew what separation had actually existed at the time. Therefore, the Board concluded that this Airprox had resulted because the Falcon DA20 crew flew sufficiently close to cause concern to the AS332 crew, but in the member's view no actual risk of a collision had existed in the circumstances reported here. This was not meant to question the veracity of the report provided by either the AS332 pilot or the DA20 pilot in any way – more a statement of fact - and the Chairman took care to emphasise that this was purely based on the limited information provided by the pilots themselves and without independent corroboration it was impossible to arrive at a more meaningful conclusion.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Falcon DA20 crew flew sufficiently close to cause concern to the AS332 crew.

Degree of Risk: C.

AIRPROX REPORT No 175/03

to the crew about the unknown ac, advising them that a turn might increase the likelihood of collision and to watch the situation on TCAS. The unknown ac then commenced a fast climb to FL100 about 5nm away from the FK70 [actually first shown at 7.3nm range], so she issued an avoiding action turn - hard right onto a heading of 350°, whereupon the FK70 crew spotted the other ac visually and also reported a TCAS RA. The unknown ac subsequently coasted in at Weston-Super-Mare, maintaining FL100.

ATSI reports that the FK70 was inbound to Cardiff and had planned to route LAM – CPT – ABDAL – BRI – CDF. Once it had been transferred from LACC to Bristol RADAR, it would be positioned by the Bristol APR and descended to an appropriate level for Cardiff. The FK70 crew established communications with Bristol RADAR and reported descending to FL110, whereupon the APR instructed the crew to fly a heading of 280° and to expect radar vectors for the ILS at Cardiff. Shortly before 1253:30, the APR instructed the crew to descend to FL80, which was acknowledged. At 1254:00, the FK70 left CAS, just to the southwest of ABDAL, but this was not notified to the crew. MATS Part 1, states that when ac are operating outside CAS, on ADRs and within RAS Areas, it is important that no confusion exists, between the controller and the pilot, as to whether or not a radar service is being provided; and the type of radar service being given. Outside CAS it is the responsibility of the pilot to request the radar service he requires. However, if the pilot fails to specify the type of service, the controller must ask the pilot which radar service he requires and also obtain a readback from the pilot.

At 1254:30, the radar recording shows the Tornado in the FK70 crew's 2 o'clock at 19nm, on a converging track with a constant Mode C readout of FL65 before the APR instructed the FK70 crew to descend to FL60 at 1257:35. The FK70 was passing FL115 at this time with the Tornado at 2 o'clock - 11nm. At 1258:00, the APR revised the earlier descent clearance "*[C/S] stop descent now flight level 100 there is traffic in the Channel in your right 2 o'clock at a range of 6 miles right to left indicating flight level 65 it looks like a fast jet*". This instruction was given just after the Tornado had made a 20° L turn from a track of 240° onto 220°. Once the FK70 crew acknowledged this the APR transmitted just before 1258:30, "*...I can't turn you right it'll be in confliction and if he turns left it'll catch up with you so keep a very good lookout and watch your TCAS he's in your right two o'clock now at a range of five miles right to left and...if you want avoiding action suggest...hard right onto a heading of three five zero*". The Mode C readout of the Tornado had showed a constant FL65, however, from 1258:23, the GR4's Mode C indicated that it had commenced a climb. In reply the FK70 crew reported "*...we have a TCAS now.*" To which the APR responded, "*Roger turn right heading 350 it is climbing now 80 climbing avoiding action 350*". The FK70 crew read back the instruction and commenced the R turn [as they levelled their ac at 1258:48, at FL100]. The APR updated the traffic information at 1259:00, "*...that traffic is similar level coming round into your left 10 o'clock at a range of...2 miles have you got it?*" whereupon the crew advised "*yeah we have it [C/S] we're TCAS RA but were visual*". The APR then advised the crew that when ready they could return to the assigned heading of 280°. The radar recording shows the Tornado crossing ahead of the FK70 from R – L [1.71nm at 1259:13], the latter maintaining FL100 as the GR4 passed 300ft beneath indicating FL97. [The CPA was shown at 1259:21, after the Tornado had passed ahead and was flying into the FK70's L 9 o'clock at 1.1nm]. As the tracks diverged the APR advised the FK70 crew that the other traffic was military, not working Cardiff or Bristol and added "*...you are outside controlled airspace under Radar Advisory*". The FK70 crew was then instructed to continue descent to FL60, as the tracks quickly diverged and separation was subsequently restored. The APR operated as though a RAS was being provided although this had neither been requested nor confirmed with the crew. Under the circumstances, there was little more that could have been done. However, with the benefit of hindsight, a timely instruction to carry out a left hand 360° turn may have been the best option to try and resolve the developing confliction.

THE TORNADO GR4 PILOT'S STATION comments that the GR4 crew was carrying out a high workload sortie, preparing for an intercept on a pair below. This is a demanding part of the sortie that can erode into other parts of their duties. In hindsight, a radar service might have prevented this occurrence, but because of the good weather, high workload factor and Class G airspace the crew dismissed the idea. At no time was any deliberate movement made toward the airliner; the GR4 crew

levelled at FL100 and maintained their course until the intercept geometry on the Tornado pair was attainable.

It is unfortunate that the FK70 was given a series of changing TCAS alerts in this case. However, this occurrence did take place in Class G airspace, the FK70 crew was given a warning and acquired the jet visually, albeit late. It is unfortunate that on this occasion the Tornado did not see the FK70 and take appropriate action.

HQ STC comments that the Tornado crew made a poor choice of airspace for their planned exercise without a radar service; especially given their position between the busy CTAs of Cardiff, Bristol and Cotswold, plus being 1000ft beneath G1 (base FL75). A radar service from Yeovilton from either the ATCRU or the embedded fighter control unit (RNSFC) would have significantly reduced the risk of this type of occurrence. The GR4 radar is optimised for ground mapping and, whilst it has a limited air-air mode, should not be relied upon for flight safety.

Fortunately, ATC & TCAS provided the FK70 crew with a warning of the Tornado's presence, however, this Airprox demonstrates the limitations of TCAS II advisories generated by a dynamically manoeuvring fast jet.

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 HQ STC contended that a radar service obtained from the RNSFC might have allowed the GR4 crew to obtain a warning about the FK70, the CinC Fleet member explained that the RNSFC was not established to provide routine air defence services, unlike a CRC. An ADS in these circumstances could not be guaranteed, but the school might be able to do so for pre-arranged sorties on an opportunity basis. Yeovilton ATC, during their operating hours, were possibly best placed routinely to assist the GR4 crew or indeed Cardiff with a published UHF frequency or Bristol themselves, but the provision of a RIS could have had a beneficial effect on the eventual outcome. Nevertheless, the GR4 crew chose not to obtain a radar service in view of their anticipated workload during the 'bounce'. Fast-jet members were not convinced that in the period before the bounce the workload during this particular phase of the sortie was that high, but added that the GR4's radar should have detected the large FK70 target in the Air-Air mode. The HQ STC member reiterated that it was unwise to plan a sortie of this nature in the close vicinity of this airspace without the benefit of an ATS and the crew should have seen the FK70. In the see and avoid environment of the Open FIR, in unlimited visibility, there was a compunction on the GR4 crew to do just that. Whilst some suggested they would be concentrating on the task at hand looking for their 'targets' this did not absolve the GR4 crew from their general look out responsibilities. The opportunity was there for them to see the FK70 – that they did not was a significant contributory factor.

Other civil controller members were concerned at the FK70's filed routeing through Class G airspace, which apparently 'cut the corner' between ABDAL and Cardiff after leaving the sanctuary of CAS. This is a busy corner of the FIR where military and GA traffic can always be expected to be encountered crossing the Bristol Channel. Members emphasised that it is commonplace for fast jets to descend to low-level down the channel after a high or medium level transit across the UK, something that RADAR was probably all too aware of. Whilst recognising the legitimate rights of passage of civilian and military ac alike through the Open FIR, members wondered if an appropriate safety analysis had been conducted of this route by the company to mitigate the inherent risks. A civil controller member observed that CAS existed purely for the benefit of CAT and if the crew had remained within CAS - as was feasible into Cardiff - this Airprox would not have occurred. Manifestly, a RAS would assist greatly

AIRPROX REPORT No 175/03

in establishing appropriate separation against other traffic in the FIR. The Board echoed the sage words of ATSI and emphasised the importance of establishing the type of ATS pilots required once ac depart the known traffic environment of CAS.

Whilst the Bristol RADAR controller had not affirmed the type of ATS on RT, it seemed clear that she was providing a RAS and was seeking to achieve standard separation of 5nm or 3000ft uncoordinated Mode C against other observed traffic. Controller members, both civil and military, were aware of the unpredictable nature of ac manoeuvres in the FIR and were well aware of the difficulties involved in providing a comprehensive RAS in Class G airspace. Early detection of potential conflicts necessitates a comprehensive scan of the airspace and to achieve the desired minima of 5nm against a fast-jet requires prompt, positive action at an early stage. Here the actual radar picture displayed to the Bristol RADAR controller was not recorded so exactly what was shown to the controller remained unknown. Nonetheless, the NATS Clee Hill SSR (which also provides the SSR data to Bristol ATC) displayed the GR4 at FL65 some 19nm away at the time the controller instructed the FK70 crew to descend through the GR4's level to FL60; the developing conflict with the FK70 was apparently not evident to RADAR at that stage. The controller reported detecting the fast-jet when it was 10nm NW of Bristol, but she did not attempt resolution until the GR4 was "...right 2 o'clock at a range of 6 miles right to left indicating flight level 65..." by stopping the FK70's descent at FL100, thereby affording more than the 3000ft Mode C minima she was seeking. Unfortunately, moments after this instruction was issued the GR4 started climbing toward the descending airliner. Controller members opined that the unpredictable nature of the GR4's flight path suggested turning the FK70 would have been a better option. Those members familiar with the local airspace explained there was always potential for the GR4 to climb once it cleared the lateral boundary of G1 and it was unlikely to remain at FL65 close to the top level of Class D airspace since the GR4 crew knew where the CTA was. This was said with the benefit of hindsight, but it seemed that earlier more positive action whilst not necessarily achieving 5nm separation would have averted the close quarters encounter and afforded the GR4 a somewhat wider berth. As it was, at this close range there was little else the controller could do; the 360° left orbit suggested might have worked, but it would also have placed the FK70 tail-on to the GR4 at the critical moment denying the airliner's crew any chance of seeing the fast-jet at all. When RADAR advised a R turn onto 350° at 5nm range the controller was still trying to help resolve the situation, but TCAS was required to act. However, the 'CLIMB' RA eventually enunciated would probably not have allowed the FK70 crew to outstrip the climbing GR4. Fortunately the Tornado crew levelled off just below the FK70 and the airliner's crew spotted it as they turned in conformity with the avoiding action advised by RADAR. So, after weighing all the factors carefully the Board concluded unanimously that this Airprox had resulted from a straightforward, unexpected conflict in Class G airspace.

When the two tracks crossed just over 1nm was achieved behind the GR4 because of the R turn, evincing the efficacy of the APR's avoiding action turn in the horizontal plane. This turn coupled with the APR's traffic information, the alert provided by TCAS and the FK70 crew's eventual sighting of the GR4 led the Board to conclude that fortunately, no risk of a collision had existed in the circumstances reported here. However the lesson to be drawn from this encounter, in the Board's view, was that positive action needs to be taken early to be effective.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in Class G airspace.

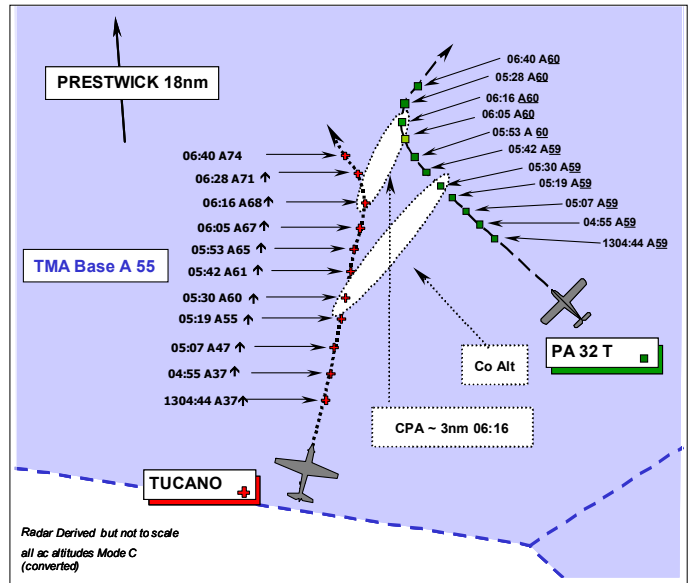
Degree of Risk: C.

Contributory Factors:

1. Late application of an avoiding action turn by the APR.
2. The Tornado GR4 crew did not see the FK70.

AIRPROX REPORT NO 176/03

Date/Time: 7 Nov 1308
Position: 5519N 00411W 18NM SE Prestwick)
Airspace: Scottish TMA (Class: D)
Reporter: Prestwick
First Ac Second Ac
Type: PA32T Tucano
Operator: NR HQ PTC
Alt/FL: NR NR
 NR (RPS 1016 mb)
Weather NR VMC
Visibility: NR 20km
Reported Separation:
 NR NR
Recorded Separation:
 ~ 3nm 1000ft



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

PRESTWICK APR reports that at approx 20nm SE of Prestwick a Tucano climbed into the Scottish TMA into conflict with the PA32T flying IFR under the control of Prestwick APR, heading 320° at an alt of 6000ft. A 7001 squawk 7NM SW of the PA32T and previously seen to be maintaining 3700ft (unverified), was observed climbing on a N/NE track into conflict with the PA32T. As the Mode C on the 7001 squawk indicated 5500ft climbing TI was passed to the PA32T followed closely by avoiding action, initially onto heading 050° then 090°. As the PA32T was turning through approx 360°, the 7001 squawk, now maintaining FL075 approx 3nm SW of the PA32T, turned onto a NW heading and contacted APP on 120.55 (his initial call). The ac was identified as one of several Tucanos that were booked into Prestwick and for which details had been passed. D&D had contacted APP on the direct line requesting information on the Tucano and they confirmed the unauthorised climb by the ac into the TMA.

THE PA32T PILOT was based overseas and despite identifying the ac, the operator and the UK Handling Agent, the UKAB was not able to contact the pilot, therefore a report was not available.

THE TUCANO PILOT reports that he was a solo student flying a black Tucano on a planned low-level land-away sortie from Linton on Ouse to Prestwick. TCAS was not fitted but he was squawking 7001C with HISLs selected on and was listening out on the low-level common frequency. Approximately 5min before the planned pullout, he tried to listen to Prestwick ATIS while still at low level before commencing the recovery to Prestwick but was unable to hear it and he assumed that this was not unusual due to the distance from Prestwick and the surrounding terrain. He eased up to approx 1000ft agl and tried to contact Prestwick Radar, but again nothing was heard so another contact was attempted approx 30sec later. He then climbed to approx 2000ft agl and tried to contact Prestwick on alternative frequencies but again this was unsuccessful. He was then at the planned pullout point of Loch Doon, and he entered a climbing left hand turn while assuming there were problems with the VHF radio. Whilst reading through the radio failure procedure, he decided to transmit once more on Prestwick Radar before squawking 7600. This time he heard the word 'manual' transmitted on the frequency. He then realised the problem, selected 'manual' and successfully contacted Prestwick Radar. He was informed that an Airprox was being filed as avoiding action had been given to another ac. He did not see the other ac at any time and was not aware of its position.

AIRPROX REPORT No 176/03

UKAB Note (1): The Tucano radio controller has the option to select either preset channels or to manually dial a frequency. If the manually dialled frequency is to be used the channel selector should be set to 'M' (manual) otherwise the transmission will be made on the channel selected not the desired manually dialled frequency.

STATION COMMENTS there is no reason why this student pilot was in such a rush to enter CAS without clearance. Even if he had a genuine radio problem then basic airmanship would dictate that the drills should be followed and 7600 is squawked prior to penetration, to allow ATC to react to the emergency. This was a basic error of judgement that could have had dire consequences if fate had played a different hand. Whilst the pilot was a student undergoing flying training, he had the experience and was explicitly briefed to achieve 2-way communication with Prestwick before entering their airspace. All 1FTS crews have been re-briefed on the need to obtain positive clearance before penetrating CAS.

UKAB Note (2): The recording of the Lowther Hill Radar was of poor quality and, although it is possible to read the tracks and alts of the respective ac, it was not possible to verify accurately the scale and therefore the separation distances between the ac. It is however, estimated as being of the order of 3nm at the CPA. Further, the Tucano climbed to a Maximum of 7400ft when the recording stops, before the transcript shows the ac as being identified by Prestwick APR, just after 1307, 30sec after the Airprox had occurred.

UKAB Note (3): The Prestwick controller transmitted the first avoiding action to the PA32 at 1305.30. No turn can be seen on the radar recording immediately after that instruction. Shortly after minute 06 the controller instructs the PA32 pilot to continue right on to heading 090° but does not reiterate the prefix 'avoiding action'. Only after the second instruction can a corresponding turn be seen on radar.

ATSI reports that the radar recording CD from SCACC is not of good quality and it has not been possible to establish the positions of the ac with any degree of accuracy. However, based on the position of the Airprox reported by the controller, it occurred within the Scottish TMA (Class D) where the base is 5500ft. The PA32 was level at 6000ft when the Prestwick APR spotted the Tucano climbing into CAS. He issued an appropriate 'avoiding action' turn to the PA32, together with TI. These were, subsequently, updated before the Tucano called on the frequency. The APR did well to realise the situation and took appropriate action to resolve it.

HQ PTC comments that with the Tucano student preoccupied with his own distractions and the lack of any input from the PA32, the significance of this Airprox must at best remain speculative. However, the student pilot is a wiser aviator (who will have been counselled against relying on ethereal intervention in future). We note and endorse the remedial measures taken by the CI at station 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 photographs/video recordings, reports from the air traffic controllers involved and reports from the appropriate ATC and operating authority.

Members concluded that the train of events in this incident was promoted by a straightforward, and frequently made, radio switching error by an inexperienced student pilot. Notwithstanding his error he was unwise and wrong to rush headlong into busy CAS and to climb well above the safety altitude. The Board accepted that he had learned from his experience.

The Board commended that the Prestwick APR Controller who by his timely intervention prevented a potentially hazardous incident.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Tucano pilot entered Class D CAS without clearance and flew into conflict with the PA32T which he did not see.

Degree of Risk: C.

issued an avoiding action R turn to the FK70 crew onto 250° against a track under the control of London Military Controller 15 (LRAD15) about 12nm to the S squawking A6151, that was observed, heading N at FL130 – the F15C flight. The FK70 crew did not comply with his avoiding action instruction initially and asked him to confirm the heading of 250°, which he did adding further traffic information about the other ac. Whilst attempting to co-ordinate with LRAD15 the FK70 crew reported they were complying with a TCAS DESCEND RA that he acknowledged; LRAD15 stated that the F15 pilot had been visual with the FK70 at a range of 6nm and had climbed to avoid it. He did not perceive that standard separation had been eroded.

[UKAB Note (2): Analysis of the Cromer Radar video recording shows the FK70 climbing to the E of Norwich and the F15 flight initially heading SSE. The F15 flight turns westbound and then at 0936:04 steadies northbound maintaining FL122 some 1400ft above the FK70 that is passing FL108 11nm away. At 0936:40, the FK70 had ascended to FL119, before initiating a descent in conformity with the reported TCAS RA down to a minimum of FL115 coupled with a right turn to the southwest. By the time the FK70's R turn becomes apparent, the ac had closed to 4.6nm – the point of minimum vertical separation of 300ft. At 0936:50, the F15 flight is shown climbing in conformity with the flight lead's reported avoiding action climb and had turned to the L. At 0937, the F15 Flight had climbed some 2000ft above the FK70 - level at FL115 - as they pass at a minimum range of about 0.6nm.]

MIL ATC OPS reports that the F15C flight, was working LRAD15 under a RIS. The flight was manoeuvring near the E Norfolk coast and at 0936:07 the pilot was advised of "...traffic north 10 miles tracking south east indicating FL110". At 0936:25, the Norwich APR made contact with LRAD15 although no meaningful conversation took place until 0938 – 1min after the Airprox. LRAD15 called the FK70 to the F15 again at 0936:31, "...that traffic [unintelligible words] 4 miles crossing left right FL120". LRAD15 reports that at this stage the F15 leader said that he was visual with the FK70 and climbing to avoid it, however such transmissions are masked by the landline communications and are not substantiated by the transcript. [However, later references within the transcript suggest this interpretation is correct.] Traffic information was exchanged between each controller at 0938 although no positive co-ordination took place and by this time the Airprox had occurred.

It is evident that LRAD15 applied the RIS accurately. Having passed traffic information at 10nm this was updated 33secs later, which allowed the F15 pilot to become visual with the FK70 and climb to avoid it. The line from the Norwich APR was opened by LRAD15 when the ac were about 5.82nm apart, too late for any effective co-ordination to be achieved. It appears as though the avoiding action turn issued by the Norwich Controller also exacerbated the situation. There appears to be no contributory Mil ATC factors within this Airprox.

ATSI reports that the Norwich APPROACH RTF recordings from RAF Coltishall are about 7min behind the LTCC radar recording timebase, therefore all timings within this report have been correlated to that of the radar recording - UTC.

The FK70's FPL routing was direct to MOLIX at FL150, which required an ENE'ly track after departure from Norwich. After take-off from RW27, the FK70 turned R and was instructed to route direct to MOLIX by the APR. However, the controller was aware of military emergency traffic, 2xF15s dumping fuel [NOT the subject flight of 2xF15C], SSE bound, just to seaward of the FK70 at FL145, so he instructed the FK70 crew to turn R initially onto a radar vector of 120° and a short time later further R onto 150°, his plan being to try and get ahead of the emergency traffic. However, the FK70 and emergency traffic were flying at similar speeds so the FK70 was unable to overtake the latter as the airliner climbed. The APR telephoned the appropriate LATCC (Mil) Controller in communication with the emergency ac just after 0935:30, [NOT LRAD15] to see whether they could be turned so that he could get the FK70 back on track to MOLIX, but the controller declined to ask the emergency traffic to turn. The APR accepted this but, before terminating the call, asked to be transferred to "...Controller 15 then for coordination" at about 0936:30, - the controller of the subject F15C Flight involved in the reported Airprox - as he had noted this traffic was turning onto a conflicting track with the FK70. At about 0936, whilst 11nm S of the

AIRPROX REPORT No 177/03

FK70 and level at FL122, the F15 Flight had turned R from a westerly heading onto a track directly towards the FK70, which was then climbing through FL108. While waiting for LRAD15 to reply, the APR instructed the FK70 crew *“avoiding action [C/S] avoiding action turn right immediately heading 250 traffic was southeast northbound F15 traffic FL122”*. The pilot sought confirmation of the heading to which the APR replied, *“make it hard right - heading 250 there’s F15 traffic south 6 miles northbound flight level 122.”* The pilot responded by reporting *“we’re TCAS descent [C/S] TCAS descent”*, which the controller answered *“acknowledged report complete”*. A few sec later the pilot reported visual with the traffic, still following the TCAS RA. Meanwhile, LRAD15 had answered the landline and in the background can be heard passing traffic information to the F15 flight before advising the APR that the flight lead was visual and climbing above the FK70. The two controllers then agreed a course of action to ensure that no further conflict took place as the FK70 continued its R turn all the way around onto a NE’ly heading back towards MOLIX.

Until the subject F15 Flight turned onto the northerly track, they did not pose a problem to the FK70. However, once they did turn, with an observed closing speed in the region of 800kt, there was less than 1min available before the tracks would cross. It is difficult to correlate the timings on the RTF and radar recordings, but the APR appears to have picked up the conflict early and responded promptly using the most recent ‘avoiding action’ phraseology, albeit the FK70 crew had to ask for the heading to be repeated. Although the crew did comply with the turn instruction, the FK70 was only passing through S at the CPA by which time TCAS had intervened. The Norwich APR was faced with a difficult situation when the F15 flight unexpectedly turned towards his FK70. He was constrained by the presence of emergency traffic to the NE, but did his best to fulfil his responsibilities under the terms of the RAS being provided.

HQ 3AF comments that this was an incident during the course of which each player fulfilled his responsibilities correctly and, as a result, the closest that the FK70 and the F-15 flight approached, each with the other in sight, was 2000ft vertically and 0.6nm horizontally. With the benefit of hindsight it could be argued that the actions of certain individuals could have been executed more effectively, but the fact remains that safety was not compromised.

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.

Here there had been no suggestion that an Airprox was being filed at all, until the FK70 pilot’s written report was received by the UKAB. It was indeed fortunate that the RT and radar recordings were still available so long after the event and the Board implored pilots to make clear their intentions to file an Airprox on RT at the time to ensure that ATC are made aware. This sequence ensures that timely data gathering actions (RT and radar Tapes) would commence. Furthermore, members emphasised that although an RA was triggered this did not mean that an Airprox was automatically warranted. Operators must ensure that written submissions from pilots are submitted without undue delay – presaged by a telephone report where appropriate - to assist with the investigation, as crucial information can be lost if these reports are not submitted in a timely manner.

Norwich APR was suddenly placed in a difficult position here, as the FK70 was going to pass clear astern of the F15s until they turned northbound toward the climbing FK70’s track. It was only at that juncture that the APR’s plan was foiled and the conflict materialised, which needed immediate action to resolve. The APR’s solution of an avoiding action R turn was seen by some members to be somewhat less than the ideal but the presence of the emergency traffic to the NE dumping fuel constrained the controller’s ability to turn the airliner to the east. Thus there was little option but turn the airliner R across the nose of the jets that were approaching rapidly from the S. Unfortunately, despite being passed the

avoiding action instruction in the recommended format, the FK70 crew misheard the heading, which resulted in a delay before the turn could be effected. Crucially, LRAD15 had passed traffic information to the F15 flight leader at 10nm under the RIS that applied enabling him to acquire the descending airliner from 3nm away and climb to avoid the ac, thereby taking the jets clear above the FK70. Evidently, during the turn the FK70 crew complied with the 'DESCEND' RA; the radar recording shows them ascending to FL119 at 0936:40, and then descending in response to the RA some 400ft before the airliner 'bottomed out' at FL115. In the same period the F15 Flt leader had climbed his fighter jets some 1300ft and it was evident that at least 1000ft of vertical separation existed when the F15s crossed ahead through the 12 o'clock of the airliner at the critical moment. The Board understood entirely why the FK70 pilot had filed the Airprox based on his recollection of the event and the separation at the time, but his estimate was somewhat less than that evinced by the radar recording. The combined actions of all involved resulted in 2000ft vertical separation as the F15s passed at the CPA and started to draw aft down the starboard side, thereby removing any risk of collision entirely and leading the Board to conclude unanimously that this occurrence was a sighting report of traffic passing clear.

The ATSI advisor added that in the interests of improving the ATS available to CAT flights departing Norwich and routeing through the FIR to join CAS, it has been agreed that under certain circumstances traffic will be handed-over to LATCC (Mil) who will then provide the radar service in Class G airspace.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Sighting report.

Degree of Risk: C.

AIRPROX REPORT No 178/03

AIRPROX REPORT NO 178/03

Date/Time: 7 Nov 1512

Position: 5118N 0038W (7nm W OCK)

Airspace: FIR (Class: G)

Reporting Ac Reported Ac

Type: LR45 PA28

Operator: Civ Exec Civ Trg

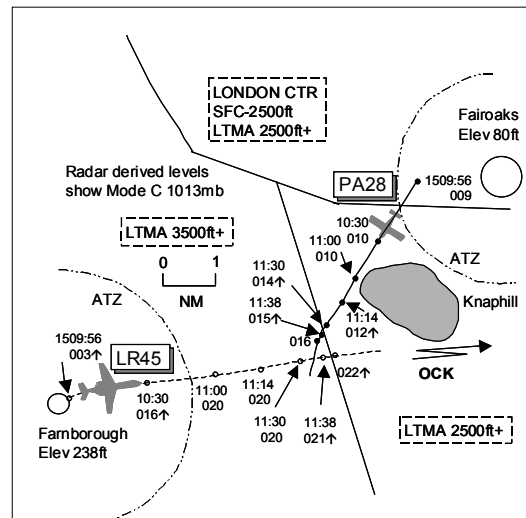
Alt/FL: 2400ft 1500ft↑
(QNH 1027mb) (QNH)

Weather VMC CAVOK VMC

Visibility:

Reported Separation:
not seen 800ft V 1.5-2nm H

Recorded Separation:
600ft V 0.4nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE LR45 PILOT reports departing Farnborough for Biggin Hill heading 088° at 210kt and in receipt of a RAS, he thought, from Farnborough on 134.35MHz squawking an assigned code with Mode C. The weather was CAVOK, the ac was coloured white/blue with strobe and recognition lights switched on. About 5nm W of OCK level at 2400ft QNH 1027mb, TCAS gave an RA “climb” command, which he followed; the conflicting ac was not seen visually. On informing ATC of his manoeuvre, he was told to maintain 2400ft; the ac was eventually levelled at 2680ft QNH.

THE PA28 PILOT was traced within 2 weeks of the incident but only completed his report when contacted by the UKAB 5 months later. He reports flying a dual training sortie from Fairoaks heading approximately 180° at 105kt and in receipt of a FIS from Farnborough on 125.25MHz squawking 0457 with Mode C. The weather was VMC and the ac was coloured blue with stripes. The whole incident had been vague primarily as he believed it had been a non-event. Near to Knaphill when climbing through 1500ft QNH, ATC had told him of another ac crossing R to L in a climb which he saw 2nm ahead ‘high’ and he watched it pass 1.5-2nm clear to his L about 800ft above. No avoiding action had been necessary as the other ac had passed a safe distance away, well separated, with no risk of collision.

THE FARNBOROUGH LARS CONTROLLER reports that the LR45 departed Farnborough at 1510 on a VFR flight to Biggin Hill routing via OCK at 2400ft QNH 1027mb. He identified the ac and provided the flight with a limited RIS, owing to poor radar performance, and passed TI to the LR45 pilot on a PA28 climbing out of Fairoaks. The PA28 pilot was asked to stop climb at 2000ft in lieu of the LR45 (not a requirement) so as to deconflict the 2 ac. The PA28 pilot reported ‘visual’ with the Lear Jet and continued its climb when clear of it. The LR45 was then handed over to Thames RADAR, its pilot reporting that he was VFR and requesting a visual approach into Biggin Hill.

ATSI comments that this Airprox occurred in Class G Airspace, whilst the LJ45 was being provided with a Limited RIS and the PA28 with a FIS by the combined Farnborough Approach/LARS Controller. Both ac were identified by the controller. Despite the fact that the RIS being provided to the LJ45 was limited, owing to poor radar performance, the controller was able to pass appropriate TI (1510:30), to its pilot, on the PA28 in his 10 o’clock range 5nm. The latter’s pilot was also informed (1511:00) appropriately of the presence of the LJ45 at 2400ft. Following an update to the LJ45 pilot (1511:14), when the PA28 was 2nm away climbing through 1600ft QNH (FL012), and no visual contact being reported, the

controller instructed the PA28 pilot to stop his climb at 2000ft, thereby ensuring 400ft vertical separation between the two flights. Nevertheless, shortly afterwards, the LJ45 pilot reported a TCAS climb, whereupon he was instructed to '*maintain two thousand four hundred feet to remain outside controlled airspace*'. This response is not in accordance with the procedure stated in the MATS Part 1, Supplementary Instruction 3/2001, Page 2 i.e. '*On being informed that an aircraft is manoeuvring in accordance with a TCAS Resolution Advisory (RA), a controller must not issue control instructions to that aircraft which are contrary to the RA communicated by the flight crew*'. This notwithstanding, the controller should be commended for taking timely and appropriate action, in excess of what could be expected in accordance with the ATS being provided, to resolve what otherwise had the potential for a close encounter. Radar recordings show that the LJ45 climbed to 2700ft in reaction to the RA.

UKAB Note (1): Met office archive data shows the Farnborough METAR EGLF 1450Z 09011KT CAVOK 13/M00 Q1027=

UKAB Note (2): Analysis of the Heathrow radar recording at 1509:56 shows the LR45 shortly after departure from RW07 at Farnborough tracking 065° climbing through FL003 (720ft QNH 1027mb) whilst the PA28 is 1.75nm W of Fairoaks tracking 210° indicating FL009 (1320ft QNH). After about 15sec the LR45 is seen to steady on a 080° track with both ac on converging tracks. At 1511:30 the LR45, level at FL020 (2420ft QNH) crosses through the PA28's 12 o'clock range 0.9nm, which is indicating FL014 (1820ft QNH) climbing. The CPA occurs 8sec later, the LR45 now indicating FL021 (2520ft QNH) climbing with the PA28 passing 0.4nm to its N indicating FL015 (1920ft QNH) climbing. Four seconds later the PA28 is seen to level at FL016 (2020ft QNH) as the LR45 diverges to the E climbing through FL022 (2620ft 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.

It was clear that the LR45 crew were mistaken about the type of ATS they were under. The controller had identified the ac and placed the VFR flight under a limited RIS which was not questioned/challenged by its crew. Subsequently, the crew were twice passed TI on the converging PA28, the second time being when the subject ac were 2nm apart with the PA28 climbing through 1600ft. As the Lear Jet crew had not reported visual contact with the PA28, the Farnborough controller, commendably, instructed the PA28 pilot to stop his climb at 2000ft, thereby deconflicting the subject ac and ensuring that they would be separated by 400ft. Shortly afterwards, the LR45 crew received a TCAS RA "*climb*" command and followed the guidance whilst the PA28 pilot visually acquired the LR45 ahead and above. It was unfortunate that the controller instructed the LR45 crew to maintain their level when they had reported a TCAS climb, contrary to MATS Part1. The crew had ignored the instruction and climbed so ultimately it had not affected the outcome. Also noteworthy was the inaccurate estimated separation distances quoted by the PA28 pilot as the close relative geometry of the encounter had been enough to trigger a TCAS warning. However, members were cognisant that this had been an encounter in Class G airspace with both crews responsible for 'see and avoid'. With the benefit of seeing all the information gathered and mindful of the TCAS element from the LR45 crew's perspective, the Board agreed that this had been a sighting report on TCAS as the PA28's flight path passed clear behind and below the LR45. The levelling-off instruction issued had rendered this encounter benign - the TCAS climb had increased the vertical separation at the CPA to 600ft - and had been effective in removing any risk of collision.

PART C: ASSESSMENT OF CAUSE AND RISK

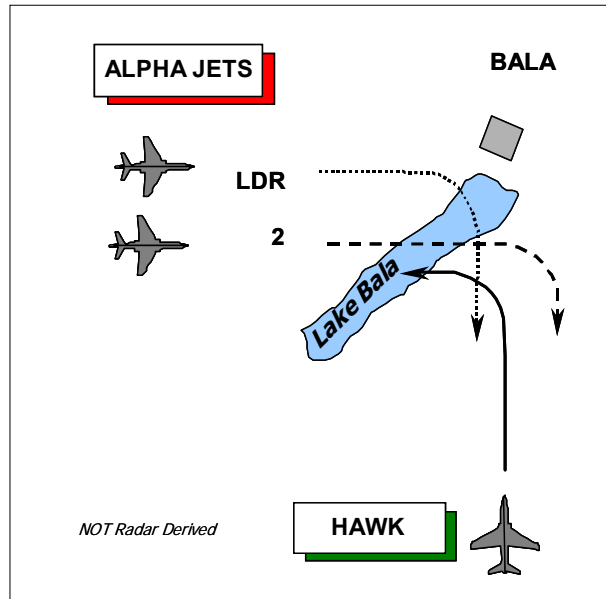
Cause: Sighting report (TCAS)

AIRPROX REPORT No 178/03

Degree of Risk: C.

AIRPROX REPORT NO 180/03

Date/Time: 10 Nov 1538
Position: 5254 N 00335 W (NE end of Lake Bala)
Airspace: UKDLFS LFA7 (Class: G)
Reporting Ac Reported Ac
Type: Alpha Jet Hawk
Operator: DPA HQ PTC
Alt/FL: 300ft Rad Alt 250ft (RPS)
Weather VMC VMC
 Haze into sun
Visibility: 7km >10km
Reported Separation:
 500-1000ft H 2- NR
 300ft V
Recorded Separation:
 NR

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

THE ALPHA JET PILOT reports leading a pair of dark green Alpha Jets, with a supernumerary pilot in the rear seat, on a low-level training sortie in Wales with HISLs selected on and squawking 7001C. They were at the NE end of Lake Bala in 1nm Battle Formation having just rolled out of a turn from approx E to S, with No2 on the left, heading 233° at 420kt and 300ft Rad Alt. Shortly after rollout the rear seat crewmember of the lead ac spotted the HISL and nose light of an ac subsequently identified as a black Hawk TMk1 at ½nm head-on, displaced approx 200m left and 2/300ft above. The front seat handling pilot only saw the Hawk when it turned left ahead of him as they were heading into sun, had just completed a turn and he was checking the No 2's position when he moved his head to check the front sector and approx 3sec later the Hawk appeared from behind the canopy arch and mirror which had been obscuring it. There was no time to take any avoiding action and it appeared that the Hawk had not seen the Alpha Jet.

THE HAWK PILOT reports flying a singleton solo QFI continuation training sortie in a black Hawk ac with HISL and taxi lamp selected on and squawking 7001C with TCAS not fitted at 420kt and 250ft. He had attacked 2 simulated targets on the Western Plain of LFA 7 and then routed over the higher ground of the 'Spine of Wales' towards Lake Bala and then towards Snowdonia and through the NW flow arrow before pulling up for general handling. He was informed 8 days after the event that he may have been involved in an Airprox but did not see the Alpha Jet. The only ac he recalled as seeing near the reported position was a pipeline inspection helicopter at Lake Celyn.

THE HAWK STATION commented that since the Hawk pilot was unaware of the incident and they did not have sight of the report from the Alpha Jet pilot they could add nothing.

ALPHA JET STATION commented that the point of this report is that both ac were flying quite legally at low level, carrying out their respective exercises, but the reporting pilot saw the Hawk too late to take avoiding action should it have been required. Hazy conditions and flight into sun undoubtedly did not make lookout any easier, but these are known hazards and the formation was flown by experienced crews. All crews are aware of the need for conscientious lookout when operating at low level, and this has been re-emphasised as a result of this incident. However, it is felt that there is unquestionably a case for a traffic alerting system to assist pilots operating on a "see and avoid" principle.

AIRPROX REPORT No 180/03

HQ PTC commented that this is another disturbing occurrence that escaped being an accident by luck alone – neither pilot was in a position effectively to “see and avoid” and they would probably have been no more visible to each other if they had been exactly co-height. The Hawk nose light again showed its value but a plain vanilla traffic alert system would have reduced this to a non event.

DPA comments that irrespective of any support for the case of a traffic alert system, this was undoubtedly an Airprox. The sighting by the Alpha Jet supernumerary crewmember was only achieved at a time when it was too late for the pilot to initiate avoiding action. Couple this with the non-sighting by the Hawk pilot and the potential for a serious accident is evident. Fortunately, and by pure chance only, the Hawk was above the Alpha Jet by a small margin. Of note is the fact that the Alpha Jet supernumerary crew reports seeing both the HISLs and the nose light of the Hawk – this may have been a significant factor in sighting the Hawk at all. Yet again a salutatory warning, which will be emphasised in the Directorates’ publications, to those who have to operate fast jets at low level.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

This was another incident in which both ac had been operating legitimately in the UKLFS from different stations and were unaware of the presence of the each other as they closed at high speed; the Hawk pilot remained oblivious throughout, while crews in the Alpha Jets remained unsighted until the rear seat pilot of the leader spotted the Hawk too late to initiate avoiding action. Fortunately however, due to pure chance the ac were separated vertically and laterally from the outset. Since the Hawk pilot reported retrospectively that the sortie was planned at 250ft agl but did not see the Alpha Jets, he was unable to report a height at the position of the Airprox. On the other hand, the Alpha Jet pilot reported that his ac was Rad Alt equipped and that he was flying at 300ft; Members therefore thought that this would be fairly accurate. He went on to report that the Hawk passed 2/300ft above him with a lateral separation in excess of 500ft which although unverified, Members thought would have been reasonably accurate. Members also thought that the timings reported by the pilot would be easy to assess and therefore also accurate; bearing in mind the closing speed however, this would mean that the rear seat crewmember first sighted the Hawk at slightly in excess of the ½nm reported.

Members had difficulty in deciding the degree of risk with a minority considering that there had been an actual collision risk; the majority however considered that there had not but, due to the (effective) non-sighting of the other ac, that their safety had not been assured.

In this instance the camouflage colour scheme of the Alpha Jets, seen from above against a background of similarly coloured terrain, had clearly been most effective. The Board however, considered that since Alpha Jets do not have any operational role, it would be wiser to paint them in a high visibility colour scheme. Significantly however, the rear seat crewmember reported seeing the HISL and Nose light of the Hawk, yet again validating their effectiveness as an aid to visual acquisition in low light conditions.

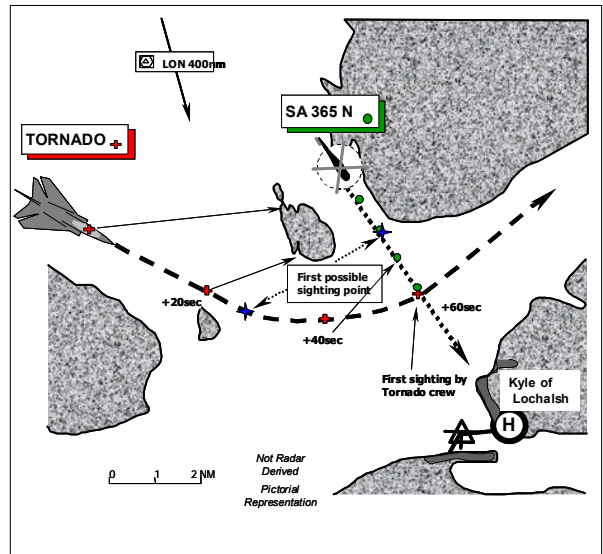
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A non-sighting by the Hawk pilot and an effective non-sighting by the Alpha Jet pilots.

Degree of Risk: B.

AIRPROX REPORT NO 181/03

Date/Time: 11 Nov 0900
Position: 5718 N 00546 W (Kyle of Lochalsh 2nm NW of Bridge)
Airspace: UKDLFS LFA14 (Class: G)
First Ac Second Ac
Type: Tornado GR4 SA 365N
Operator: HQ STC Civ Comm
Alt/FL: 500ft 800ft
(Rad Alt) (QNH 1011 mb)
Weather VMC below CI VMC Clear CI
Visibility: 10km >10km
Reported Separation:
1000ft H 500ft V 0 H 200ft V
Recorded Separation:
NR

**BOTH PILOTS FILED****PART A: SUMMARY OF INFORMATION REPORTED TO UKAB**

THE TORNADO GR4 PILOT reports flying a grey Tornado GR4 with HISLs and anti-collision lights selected on but TCAS was not fitted, on a singleton tactical training sortie in the UKLFS. During the final phase of a simulated attack profile at low level, the ac entered a 2G left-hand level turn through 80° rolling out on a heading of 040° (T) at 500 ft agl (Rad Alt) and at 520kt. As the ac rolled out, the pilot saw a grey helicopter with white HISLs on approximately 500ft above, in his left 8 o'clock, heading S at an estimated range of 1000 ft. No avoiding action was appropriate at this stage as the helicopter was passing above and behind and there was no risk of collision.

Although the in-flight visibility at the time was approximately 10km there was an overcast layer of cloud with a base of approximately 4000ft amsl which made the light levels lower than average for that time of day and the background was solid grey.

The incident was reported to Lossiemouth ATC on landing.

THE SA 365N DAUPHIN PILOT reports flying a purple ac without TCAS but with strobes, anti-collision lights and the landing lamp selected on and squawking 7000C. He was flying a customer on a round trip on the W Coast from Kyle of Lochalsh and was not in receipt of an ATC service due to the terrain, but was listening on the Kyle frequency. While heading 165° at 135kt and level at 800ft QNH he saw a Tornado GR 1/4 ac a few sec before it passed directly below them at 600/650ft. He took no avoiding action as he did not have time, and the other ac passed 200ft vertically below them. He thought that if they had been 100ft lower and the Tornado 100ft higher they would have collided and in addition, since he thought the other ac had not seen him, he considered the risk as high. He reported the incident to Scottish ACC by telephone on landing.

STATION COMMENTS the Airprox occurred at 0900 on a gloomy November day, in VMC with 10km visibility in haze. From the crew's respective Airprox reports it is likely that the recorded heights are accurate since the Tornado was using Rad Alt and the helicopter pilot had recently calibrated his altimeter. The reports put the Tornado at 500ft and the helicopter at 800ft. [UKAB Note (1): A map was provided showing the tracks of the Tornado and the helicopter]. The Tornado was flying at 520kt, 4 times the speed of the helicopter. If it is assumed that the tracks meet at the position of the Airprox it is

AIRPROX REPORT No 181/03

possible to plot relative timing marks backwards down each track. This provides an idea of the relative motion and the background terrain for each ac. From a viewpoint in the Helicopter, the Tornado would have approached from the 3 o'clock with very little relative motion and would have been difficult to see against a grey sea. From the Tornado, once the helicopter came within the reported 10km visibility, it would have been difficult to spot against the background of hills and dark grey cloud; and again there would have been very little relative motion. At 3nm and 20sec prior to the Airprox the Tornado pilot visually cleared the area into which he was turning and rolled the ac to the left. As the Tornado closed to 2nm the helicopter, 300ft higher, would have become skylined against any hills in the background that may have been obscuring it. At this range the Tornado pilot should have been able to spot either the helicopter or its HISLs. Since he did not, it is probable that as a result of the applied bank, in the turn, the canopy arch was obstructing his vision.

From the plan view drawn by the helicopter pilot the Tornado is drawn at 90° to the helicopter track, which would put the Tornado at the end of its turn rather than the beginning. The helicopter pilot reports that the Tornado passed directly below him at approximately 200ft vertical displacement; however, this does differ from the Tornado crew's estimate of 1000ft horizontally and 500ft vertically. The Tornado pilot confirmed that the helicopter was first spotted by its HISLs in his left 8'oclock at approximately 1000ft horizontal range. In order for the helicopter to appear to the left there must have been some fore and aft separation as the Tornado passed in front of the helicopter. Summarising the available information, it is most probable that the Tornado passed in front of the helicopter with a separation of up to 1000ft horizontally and 300ft vertically.

The Tornado pilot's late spot of the helicopter was probably due to an unfortunate combination of the initial poor visibility and subsequent obscuration behind the canopy arch during the long turn. Whilst all Tornado crews at Lossiemouth are frequently reminded to move their heads to improve lookout around obstructions, it is difficult to move the head sufficiently to clear the area obscured by the canopy arch. Nonetheless crews at Lossiemouth will be appraised of this recent incident and reminded to make the effort to clear this blind area with the help of the navigator.

It is possible that had the helicopter been at any other level the crew would have seen it. Moreover, while there appears to have been no risk of collision on this occasion it is noted that the helicopter pilot was flying at a sensible height above 500ft that helped keep him clear of low level fast jet traffic.

HQ STC comments that the Tornado Stn's analysis is most comprehensive. Lookout can be very difficult in gloomy conditions. It is essential for pilots to move their heads and search vigorously if other ac are to be seen at long range.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

This incident occurred on a gloomy Nov morning with both ac legitimately operating in Class G Airspace. The Tornado was over the sea which would at that time have been exactly the colour of its camouflage scheme and, in the initial stages of its left turn, would have had very little relative motion when viewed from the SA 365 cockpit. A member with considerable experience of the SA365 advised the Board that the cross-cockpit, forward and downwards view from the ac is very limited and the pilot would therefore have been doubly disadvantaged.

The Tornado crew had about 30sec in which the SA365 would have been visible to them after it appeared from behind an island. The SA365 too however, would have had little relative motion due to the Tornado's turn and would also have presented a dark (purple) ac shape against a dark background and therefore not very visible. Furthermore, it is probable that the Tornado Navigator was 'heads in'

during the turn performing his attack sequence and the SA365 may have been behind the canopy arch from the pilot's viewpoint. Significantly the pilot reported first seeing the SA356's HISL, but only after he had passed through the helicopter's 12 o'clock position, making this effectively a non-sighting.

Due to the late/non-sightings by the respective pilots, the Board determined that the safety of their ac had been compromised; however since they had been separated vertically by about 200ft and a small margin laterally (as analysed thoroughly in the Station Comments) by good fortune (and planning on the helicopter pilot's part) there had been sufficient displacement to ensure that there was not a risk of their colliding.

In this instance, the sensible decision of the SA365 pilot to operate at an alt above the band normally used by Military ac was a lifesaver. The Board commended this to all helicopter operators and was assured by specialists that most adopted this best practice when conditions allowed it.

Members also commented that in this incident both ac were squawking with Mode C and that they would have been line of sight with each other at a range of over 3nm some 30sec before the CPA. It follows therefore that had a CWS system been fitted to their ac, both pilots would have had sufficient time to react and most probably prevent the incident.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A non-sighting by the Tornado crew and a very late sighting by the SA365 pilot.

Degree of Risk: B.

AIRPROX REPORT No 182/03

AIRPROX REPORT NO 182/03

Date/Time: 11 Nov 1344

Position: 5241N 00113 E (2nm West-by-North of Norwich Airport elev: 117ft.)

Airspace: Norwich ATZ (Class: G)

Reporter: Norwich APR

First Ac Second Ac
Type: Jetstream 41 Jaguar Mk3A

Operator: CAT HQ STC

Alt/FL: 1000ft 1000ft
(QNH 1020mb) (Rad Alt)

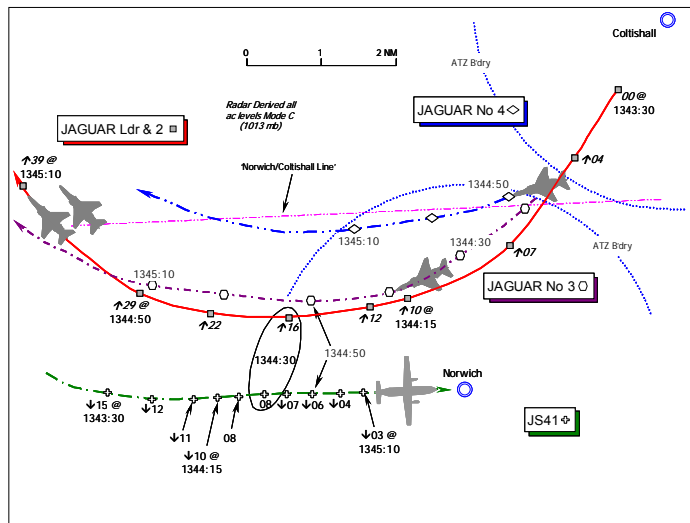
Weather IMC In cloud IMC In cloud

Visibility: Nil Nil

Reported Separation:
Not seen Not seen

Recorded Separation:

JS41 v Jaguar Ldr: 1.08nm H/800ft. JS41 v No3: 1.27nm H. JS41 v No4: 2.16nm



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE NORWICH RADAR APPROACH CONTROLLER (APR), located within the Coltishall Radar Approach Room, provided a very comprehensive account reporting that the JS41 was inbound to Norwich for a straight in NDB approach to RW09. The Coltishall Watchman SRE was not available due to annual servicing and he was using the Cromer Watchman with STC2 selected.

He transferred the airliner, which had been cleared for the approach, to Norwich TOWER at 6nm finals for RW09. Later, at 1344 he observed on his radar display an A6131 squawk – the Jaguar - departing from RW22 at Coltishall that was continuing on a SW track instead of conforming to the 'standard' RW22 departure profile. He called Norwich TOWER to advise the controller to call in the conflicting traffic to the JS41 crew, whilst simultaneously, he advised the Coltishall Radar APPROACH controller to avoid the JS41 both horizontally and vertically. At this point the JS41 was about 2-3nm finals descending. He discussed with the TOWER controller the possibility of turning and climbing the JS41 but discounted this, as the crew was descending in IMC, configured for landing at a relatively slow approach speed and would be below the minimum safe altitude if taken off the approach. He considered the best course of action at the time was to continue the JS41's approach as the conflicting jet traffic to the N was supposedly climbing and any instruction to the JS41 to climb as well might have exacerbated the problem with the succeeding Jaguars in trail, whose departure was also non standard. The only Mode C information available from the formation was derived from the No1 Jaguar, which climbed through the level of the JS41 displaying an altitude of, he thought, 100ft above the turbo-prop at its closest point horizontally. Height information on the 3 succeeding Jaguars departing in trail from Coltishall on the same profile was not known as they were only displayed as primary returns. The estimated minimum lateral separation between the JS41 and the No1 Jaguar was 1-1½nm and slightly more between the following Jaguars. The entire formation crossed the proscribed demarcation line that is orientated E – W between the two airfields, this demarcation line is the boundary of the 'buffer zone' designed to separate Norwich and Coltishall traffic.

The Norwich ATIS (Information H) was 2000m mist and cloud broken at 600ft. The weather report at Coltishall for 1350, gave 3200m Haze overcast at 500ft.

THE BAe JETSTREAM 41 PILOT reports that the navigation lights, HISLS and landing lamps were all on whilst inbound to Norwich Airport IFR in IMC. He was flying on instruments in cloud with an overcast at 700ft and a minima of 520ft. TCAS is not fitted.

Heading 090° at 135kt, he was established inbound on the NDB DME approach to RW09 and when transferred to Norwich TOWER was cleared to land. Passing 1000ft aal approaching 3nm FINALS, in cloud, he was informed of traffic – pop up at “9 o'clock” – conflicting”. No avoidance was given – or possible and it was assumed that the other ac was a Coltishall departure, climbing out and therefore – going overhead. Norwich ATC filed the Airprox and informed him by landline, the reason he did not file himself was that the other aircraft was not seen and he had assumed that the other ac was climbing out of Coltishall and thus well above their approach tracks and altitudes.

THE JAGUAR MK 3A PILOT provided a very frank account stating that his ac has a grey camouflage scheme and the HISL was on whilst leading his formation of 4ac departing from Coltishall at 300kt, IMC in cloud. He was in receipt of a RIS from Coltishall APPROACH (Colt APP) on 339.95MHz and squawking the assigned code with Mode C; neither TCAS nor any other form of CWS is fitted. Despite being well aware of the local procedures and the Norwich ‘Zone’, he led his formation through the latter on departure from RW22. The other ac – the JS41 – was not seen at all; he added that the formation entered IMC momentarily before initiating the turn onto N and inadvertently, the slightly late initiation coupled with the rate selected in conjunction with the close vicinity of Norwich airport caused the formation to cross the Norwich/Coltishall deconfliction line. As far as he could remember, no call had been given to the formation by ATC about the whereabouts of the JS41.

ATSI reports that in accordance with the relevant LoA, in the absence of prior co-ordination or agreement to the contrary, Norwich were operating on the basis that any Coltishall traffic would remain to the north of the ‘Norwich/Coltishall Line’. In the short time available, after it became evident that the departing Jaguars would be crossing the ‘Norwich/Coltishall Line’ and possibly flying close to the Jetstream, there was little more that the Norwich TOWER controller could do other than provide traffic information. With the opposite direction Jaguar apparently in a climbing right turn, a go-around or avoiding action left turn were not suitable options and with the Jetstream at approximately 1000ft in IMC, in landing configuration, the ac was not best placed to make an urgent turn in either direction. A right turn, of course, would have taken the Jetstream overhead the city.

UKAB Note (1): 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. The UK AIP at AD 2-EGSH-1-6 notifies the Norwich ATZ as a radius of 2½nm centred on RW09/27, extending from the surface to 2000ft above the aerodrome elevation of 117ft amsl.

MIL ATC OPS reports that the Coltishall RT transcripts, which include Norwich APPROACH, appear to be about 1min 17sec behind the radar recording therefore all timings within this report have been correlated to that of the radar recording and adjusted to UTC.

The formation of 4 Jaguars departed from RW22 at Coltishall, IFR, on a SID (all SIDs commence with “climb on RW track to 500 ft QFE, then turn right onto [an appropriate heading] calling Coltishall Approach”). The Coltishall weather was CC: YELLOW, 3200m visibility in haze, overcast at 500ft. At 1337:01, Coltishall Ground pre-noted the formation to Colt APP as “looking to go pair [then in turn] – singleton - singleton, 30 sec stream, squawk for number one and 4...snake climb” to which Colt APP replied “on request”. Colt APP informed Coltishall Tower (TWR) that the formation was “not released...call lined up, 340, FL165...6131 for first and last”. At 1340:55, TWR requested from Colt APP “[C/S] once I’ve given clearance departure, would like Stud 3 [Colt APP frequency] on the runway, obviously subject to your release” which Colt APP “approved ...and...released”. Just over a minute later, TWR transmitted “[C/S] cleared take off, surface wind 150, 10 knots, contact Approach, stud 3” and the formation checked in with Colt APP at 1342:25. Later, from an open mike recording at 1344:03, is heard “get them bloody north...that’s mine, sorry” and then Colt APP instructed TWR on the landline

AIRPROX REPORT No 182/03

to “*get the traffic turning please, traffic on finals 09 at Norwich, they’ve gone about 2 miles south of the line*”. Directly after issuing this instruction, the formation reported all airborne on stud 3 at 1344:19, and TWR reminded Colt APP that the formation was already on the Colt APP frequency. Immediately at about 1344:17, Colt APP issued avoiding action “[C/S]...*avoiding action, turn hard right and climb, traffic south west, one mile, inbound to Norwich RW09*” and then called for the SUPERVISOR.

Whilst the formation of Jaguars was taxiing for departure, the Norwich APR Controller was controlling the Jetstream 41, inbound for the straight-in approach to Norwich. At 1342:50, the APR instructed the Jetstream crew to “*descend with the procedure, QNH 1020*” and at 1343:00 advised the Jetstream pilot “*...5 miles from touchdown, continue with Norwich Tower, frequency...*”. After that, the APR entered into a landline conversation with LATCC (Mil) and was simultaneously speaking to 2 other civil ac. At 1344:05, APR called Norwich TOWER with traffic information on the Jetstream who “*...has traffic against him in his left, 10 o’clock, 2 miles, south west bound, can you give it to him please or...*” at which point Norwich TOWER clarified “*what level is he then?*” APR replied with further instruction “*1000 ft, turn him onto south, please, if he can maintain terrain clearance*”. Again Norwich TOWER questioned “*mine? ...you are talking to Norwich Tower*” and APR recalled the traffic for Norwich TOWER, which the latter subsequently relayed to the Jetstream at 1344:21 “*...you have traffic north east, by one mile, turning onto a westerly heading*”. The APR interjected to Norwich TOWER “*climb, climb, ...standby please TOWER*” followed by “*what the hell is that all about? We’ll talk about this afterwards*” directed to Colt APP on an open mike. Norwich TOWER assured the APR at 1344:35 “*ok, he’s past my traffic now...*”.

[UKAB Note (2): The Cromer Radar video recording shows the Jaguar Ldr [reported to be in company with No2 as a pair] climbing out of Coltishall at 1343:30, after take-off from RW22; the leader only is squawking A6131 with Mode C but the No2 is not identifiable as a separate primary contact. At the same time the Jetstream - squawking A3703 - is some 4nm W of Norwich airport, inbound in descent through 1500ft Mode C (1013mb). At 1344:15, the Leader/No2 pair is shown in a wide R turn 1.5nm NW of Norwich airport climbing through 1000ft Mode C - the same level as the Jetstream – on finals to Norwich some 2.9nm away. The pair continues in the turn closing to a minimum range of 1.08nm as the Leader climbs through 1600ft Mode C, some 800ft above the Jetstream descending through 800ft Mode C – equating to about 1010ft QNH (1020mb). The Leader/No2 continue in the R turn, departing to the NW. Meanwhile, the No3 is shown as a primary only contact following a similar track but displaced further to the N passing 1.27nm abeam the airliner ‘port-port’ at 1344:50, as the JS41 descended through 600ft Mode C. Followed by the No4 who similarly turned R on departure passing some 2.16nm N of the JS41 as the latter descends through 300ft Mode C (1013mb). All elements of the formation crossed the ‘Norwich/Coltishall Line’.]

Special ATC procedures exist between Coltishall and Norwich Airport, with a Letter of Agreement (LoA) that details the Coltishall and Norwich Airport Unified Approach Control (UAC) and includes Joint Operating Procedures (JOPs). The key point is that the LoA is designed to give both parties the maximum flexibility needed. The ‘Norwich/Coltishall Line’ is a line centred on 52°42.7N 001°19.1E, parallel to the Norwich RW 27/09 extended centreline. JOPs state that “*Colt APP is to notify the APR of all departing aircraft whose required initial or eventual track will take them south of the Norwich/Coltishall line within 15nm of Norwich Airport*”. This formation departure was not notified by Colt APP as he expected the formation to follow the SID. Although Coltishall ATC could not subsequently provide the tape transcript from the Ground controller detailing the Jaguars’ departure request, the type of SID is not in question. Colt APP was content that the ac would initially climb on track RW22 to 500ft QFE, then turn right onto 340° continuing in the climb to FL165. This profile would have kept the Jaguars N of the ‘Norwich/Coltishall Line’. The very reason that this line of deconfliction exists is to enable expeditious traffic routeing under all conditions. The Coltishall FOB states that “*if a pilot or formation leader believes they are likely to infringe the Norwich/Coltishall line when departing from RW22 (eg a pairs departure in IFR conditions) he is to inform ATC who will co-ordinate with Norwich and obtain clearance for them to cross the deconfliction line*”. This did not take place. There was very little time available for Colt APP to react to the formation crossing ‘the line’ but this lack of time was compounded

because Colt APP was trying to relay instructions via Coltishall TWR when the formation was actually already on his own frequency – Stud 3. Upon realising his error, Colt APP issued avoiding action to the formation in an attempt to deconflict them with the Jetstream. The JOPs state that *“the Coltishall and Norwich [Radar Approach Controllers] are to ensure that appropriate separation is provided to IFR departures.”* These IFR separation standards are laid down in the JOPs as follows:

Vertical. The vertical separation standards to be applied for the purpose of these procedures is 3000 ft derived from Mode C information, which may be reduced to 1000 ft when co-ordination has been agreed.

Lateral. The minimum lateral separation to be applied is 5nm. This may be reduced to 3nm between identified Norwich and Coltishall traffic, eg by recognising an assigned Mode 3A code, without further co-ordination.”

As Colt APP quite correctly expected the formation to follow the SID, no prior co-ordination should have been necessary; however, once the formation was observed deviating away from the procedures, Colt APP attempted to satisfy the separation standards, iaw the JOPs. Colt APP did apply avoiding action, along with associated traffic information as soon as was reasonably practical, since the crew had only just called airborne, despite already being on Stud 3. The FOB dictates that *“stream formations will be provided with a RIS...pilots requiring a different service are to make the request on initial call or if possible, prior to take off”*. No indication of any type of ATS was mentioned at any time from any controller or any pilot on the tape transcripts. However, Colt APP reported *“as ...their squawk appeared, I identified them under a RIS and saw Norwich had traffic on finals for RW 09...I observed [the Jaguar C/S] fly up to then through the deconfliction line... I initially contacted the ADC by landline to instruct [C/S] to tighten the turn before remembering [they] were on my frequency...I then gave [C/S] avoiding action instructions [to] turn and climb...the Norwich Approach Controller then stated he was going to file an Airprox”*. The deconfliction line exists because profiles and time do not allow standard or reduced separation to be effected. The formation was conducting a pairs stream departure, followed by 2 singletons in IFR but it is unreasonable to expect the Colt APP to act on the possibility that the formation would break the rules of the FOB. Even if Colt APP had co-ordinated the formation with the Jetstream down to 1000 ft vertically or 3nm horizontally, standard separation was unlikely to have been maintained.

THE JAGUAR MK 3A PILOT’S STATION comments that the formation leader did not believe that his formation would infringe the deconfliction line. It is also apparent that the Jaguar leader was not aware of the traffic on an approach to Norwich, and thus when the formation entered IMC he was not aware of the effect of his inadvertent actions on the conflicting traffic. Once the infringement took place there was an uncharacteristic slight delay from both Coltishall and Norwich ATC in providing positive avoiding action. However, this was obviated by the formation continuing its climbing turn onto its departure heading from Coltishall.

The incident highlights the co-ordination required to de-conflict operations at 2 airfields in very close proximity to each other. The current LoA between Coltishall and Norwich enables safe concurrent operations to the satisfaction of both parties. However, when the unexpected human factor enters the equation, in this instance through poor communication and uncharacteristic errors the safety factor can quickly be eroded. This incident has been given wide publicity at Coltishall to ensure that all involved in flying operations remain fully aware of the potential effects of seemingly minor errors.

HQ STC comments that Awareness of the need to accurately fly SIDs, STARs, and other procedures, must be kept foremost in a pilot’s mind. It is of concern that the pilot in this incident was unaware of how inaccurately he was flying (perhaps by being overly concerned with his wingman). However the No3 Jaguar also flew an inaccurate departure. The Station has taken steps to refresh their pilots on the need to fly the SID accurately.

AIRPROX REPORT No 182/03

It is worth noting that there is an advantage in ATC passing information on influencing traffic. If the pilot had been told that there was traffic inbound to Norwich, it may well have served to remind him of the need to fly an accurate SID, or perhaps he would have elected to delay departure until the potential conflict had passed. Since in the event of an engine failure or other serious emergency, the pilot would be unable to make the SID turn and would be forced to fly into conflict with Norwich traffic.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board commended the Jaguar formation leader for his frank and honest report; it was clear that a combination of factors had caused the leader to turn late, at a reduced rate thus allowing him inadvertently to cross the 'Norwich/Coltishall Line' in IMC, with his No2 in close formation. This had also resulted in the following elements doing the same thing - albeit to a much lesser degree by the No4. When executing a 'snake climb' it is usual to call the heights and turn on RT but there was no indication that that was done here on Stud 3 (though this was not mentioned in the Jaguar pilot's report, transmissions may have been made on another unrecorded frequency). Here the promulgated SID required the Jaguar leader to initiate the R turn off the runway track at a height of 500ft QFE. Some fast-jet pilot members questioned the efficacy of this procedure as the distance upwind of the runway at which this height was achieved when climbing away, was a variable factor. Whilst this method might be satisfactory for ac at lighter auws, when heavy, in IMC, or as a formation there would be a tendency to extend upwind before 500ft was reached and two of these factors applied here. Hence, from the outset on RW22 there was significant potential for unintentionally getting closer to the 'Norwich/Coltishall Line' than anticipated, thereby quickly eroding any safety 'buffer' against Norwich traffic inbound on RW09 – as occurred here. Moreover, pilots of single seat ac would have greater difficulty in judging their proximity to 'the line' without assistance from ATC. Much debate ensued about the efficacy of the FOB's stipulation of a RIS to stream formations. Here the formation leader reports he was IMC in cloud; as a RIS is essentially a VFR traffic information service with no avoiding action or separation offered or implied, its application to flights IMC in cloud was seemingly unwise - how could the Jaguar leader avoid traffic if he was not told about it beforehand or could not see it? With a solid overcast at 500ft (just where the jets would be turning) and 3200m in Haze whilst departing at 300kt – 5nm/min – the jets could potentially exit the Coltishall ATZ (2 ½ nm radius) within 30 sec from take-off and be across 'the line' moments later - little time for the controller to recognise the problem and do something about it - here there were only two sweeps of the radar between the lead jet showing inside the Coltishall ATZ and passing across the 'Norwich/Coltishall Line'. The formation had sensibly switched to Stud 3 for the take-off/departure that facilitated early action by APP if required, but it was very unfortunate in the 'heat of the moment' that APP had not transmitted a warning earlier and this factor had ultimately delayed resolution of the conflict. Some might say that under a RIS the controller was not required to act – but here he wisely did so and proffered avoiding action and traffic information. Nevertheless, the Jaguar leader could have anticipated these difficulties and requested a RAS from the outset. From the comprehensive analysis conducted by Mil ATC Ops, the unit was evidently aware of this shortfall and had placed a responsibility on pilots to inform ATC if this was foreseen so that co-ordination could be effected. Here for whatever reason the Jaguar leader had not anticipated this situation and had thus not prewarned Colt APP. Given the responsibilities placed on the pilot by the Coltishall procedures the Board agreed unanimously that this Airprox had resulted from a situation where, in IMC, the Jaguar formation had crossed the 'Norwich/Coltishall Line' without informing ATC beforehand and into conflict with the Jetstream 41.

The Station had commented themselves that when the unexpected occurs *"the safety factor can quickly be eroded"*, and the Board did not underestimate the difficulties of operating IFR traffic concurrently in such close proximity at these two busy airfields. Although the current LoA might seem to enable safe

concurrent operations the Mil ATC Ops report had contended otherwise; even if co-ordination had been achieved to cross the 'Norwich/Coltishall Line' the promulgated separation against the inbound JS41 would not have been maintained, suggesting that the departure should have been delayed until the Norwich traffic was clear – or vice versa. Though the Jaguar formation was subject to an IFR 'release', this apparently took no account of sequencing the formation behind the JS41 in the event that the jets crossed the line and got too close. Controller members opined that as the 'zone' was in effect IFR the formation should have been delayed till the JS41 was well clear and more positive control exercised to ensure that the opposing departure and arrivals were more closely co-ordinated. The STC fast jet member opined that the Command's view was that the procedures in use at Coltishall were not robust enough to cater for the unexpected and there was minimal room for error; a single engine failure, or the 'loss' of a wingman in cloud on departure, would necessitate the pilot flying straight ahead - not a problem on RW04 but on RW22 traffic could be across 'the line' before anything might be done. The safety of operations between these two busy units was predicated on each taking action in time to remain clear of 'the line', something that neither unit could guarantee doing. Other members concurred and the STC member said that it was intended to conduct a review of these procedures in close conjunction with the station; the members unanimously endorsed this positive approach and the Chairman asked that the Board be appraised of the outcome.

Turning to risk, from the radar recording it did not appear that the formation leader had altered his rate of turn at all from that already selected after Colt APP passed avoiding action at about 1344:17. This was about the same time that the leading jets were climbing through the level of the Jetstream. Less than 15sec later they passed marginally over 1nm abeam the JS41 'port-port', but at this range crucially 800ft above it. This was followed by the No2 who passed about ¼nm further away at 1.27nm and the No4 that passed over 2nm away, but without Mode C the respective vertical separation could not be ascertained. After switching the JS41 to TOWER the Norwich APR was rightly concerned about the unannounced incursion of the Jaguar formation into 'his' airspace. The Board agreed that the available options were extremely limited and continued descent on the procedure was at least taking the JS41 below the climbing jets. Evidently the JS41 pilot was not best placed to do anything; IMC in cloud and configured for landing, the ac was at a very vulnerable stage of flight but the APR had taken positive action, asked TOWER to pass traffic information and offered avoiding action. Whilst this alerted the JS41 crew to the deteriorating situation the transcript showed that there was, perhaps understandably, some confusion between the two Norwich controllers and the suggested avoiding action was never relayed to the JS41. This was possibly too ambitious and ATSI's sage comments were noted. Nonetheless, in some members' view it was purely the existing dynamics of the situation – the JS41 descending eastbound and the jets climbing and turning away - that resolved the confliction rather than any avoiding action proffered. All the safety nets designed to allow these two airfields to operate on opposing runways simultaneously in IMC conditions had been breached to varying degrees. Whilst the minimum ranges and levels that applied here forestalled an actual collision, in the Board's view safety had not been assured by any means.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: In IMC, the Jaguar formation crossed the 'Norwich/Coltishall Line' without informing ATC beforehand and into confliction with the Jetstream 41.

Degree of Risk: B.

AIRPROX REPORT No 183/03

AIRPROX REPORT NO 183/03

Date/Time: 12 Nov 1354

Position: 5248N 0233W (3½nm E of Shawbury - elev: 249ft)

Airspace: MATZ (Class: G)

Reporting Ac Reported Ac

Type: Squirrel HT1 Untraced

Operator: HQ PTC N/K

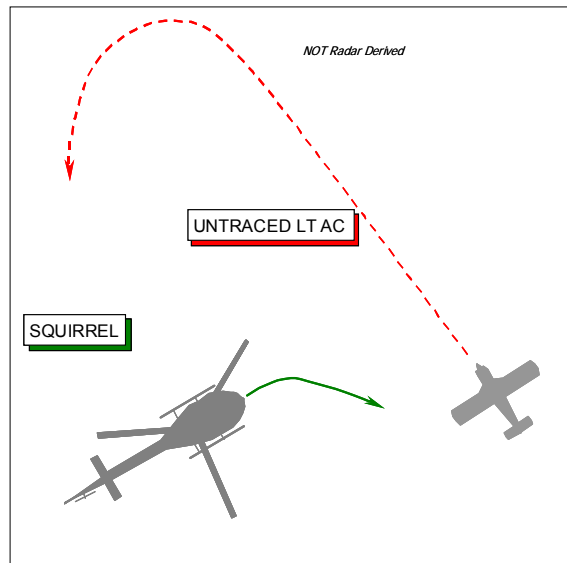
Alt/FL: 1000ft
(QNH) (N/K)

Weather VMC NK

Visibility: 40km+ NK

Reported Separation:
100m H/nil V NR

Recorded Separation:
NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE SQUIRREL HT1 PILOT, a QHI flying with a student in the right-hand seat, reports his helicopter has a black/yellow colour-scheme and the HISL was on whilst departing VFR from Shawbury for a low-level NAVEX at 100kt. They were under a FIS from Shawbury ATC on Stud 4 he thought and squawking the assigned code of A0221 with Mode C. Outbound at 1000ft ALT flying 'out of the sun' straight and level the student PF called out "glider 2 o'clock, some way away", he looked out but despite moving his head to look around the ac stanchion only saw another helicopter about 2nm away. Heading 060° just 3½nm E of the aerodrome his student completed the departure and low-level entry checks whereupon he took control of the helicopter. Whilst he was executing his lookout scan prior to descending to low-level his student PNF said something like "its a fixed wing much closer". Upon moving his head forward he spotted a single engined light ac (LA) at 2 o'clock about 150-200m away. He immediately took avoiding action, rolling hard R and descending as the other ac passed about 100m ahead from R – L on a steady course. The pilot of the other ac - that was similar in shape to a Piper Cub but more the size of a microlight possibly with a tricycle u/c and a blue fuselage – appeared not to take any avoiding action at all but subsequently turned onto S some 1-2nm beyond the location of the Airprox. He assessed the risk as "medium".

AIS (MIL) reports that the LA is not evident at all on the LTCC radar recordings. Further enquiries with Shawbury ATC, local aerodromes and microlight clubs revealed no more clues and extensive procedural tracing action, conducted with the assistance of the British Microlight Aircraft Association ultimately proved fruitless. Therefore, the identity of the reported ac remains unknown.

MIL ATC OPS reports that Shawbury APPROACH (APP) was providing a listening watch FIS to the Squirrel crew on Stud 4 that was band boxed with the ICF (362-47MHz) Stud 9. The Squirrel was conducting a low-level NAVEX in LFA9 and at 1352:58 informed APP, "[C/S] High Ercall Gate entering Eastern for NAVEX Stud 5", which was acknowledged. For the next uneventful minute the Squirrel operated on Stud 5 a quiet frequency, before returning to Stud 4 at 1354:07 to question APP, "were you aware of the light aircraft just coming up towards the airfield at 1000ft? He's just inside the gate at the moment". APP responded, "I'm not". The Squirrel Pilot updated the position of the traffic to the radar controller "he's now orbiting approx two miles East of the field at 1000ft" and APP acknowledged this. At 1354:49, the helicopter declared "we had a very late spot, it's a possibility of an Airprox on that one".

APP answered “*we have checked with ZONE, that aircraft, which has now turned towards the South in fact, is not working Zone*”. The Squirrel crew switched from Stud 4 at 1356:22.

Information from the Clee Hill Radar recording has been inconclusive. At 1350:00, two tracks squawking A0221 are seen climbing out of Shawbury, turning E after departure. The second of the 2 tracks [in all probability the helicopter flown by the reporting QHI] fades from radar but pops up again after the Airprox at 1354:20, heading N at 800ft Mode C (1013mb) before fading again. Meanwhile the first A0221 squawk [probably the other helicopter seen by the reporting pilot] is seen 6nm E of Shawbury at 1356:00, the time the Airprox is reported to have occurred. The Airprox is not seen on radar recordings and the reported ac has not been traced.

The Squirrel helicopter was operating VFR on a FIS at 1000ft Barnsley RPS, outbound from RW23. It was the student that first noticed a conflictor in the 2 o'clock position and then on pointing it out the QHI saw it and descended, reporting the time of the Airprox as 1356:00. However, from the RT tape transcript the Airprox is reported to have occurred just before 1354:07. Nevertheless, the APP controller's report details that the subject Squirrel pilot requested information on an ac operating “*at Hodnet Gate*”. APP said that he “*observed 2 contacts on the radar screen in the vicinity of Hodnet Gate [3nm ENE of the aerodrome] - one ac squawking 0221 [probably the Squirrel flown by the reporting pilot with a Shawbury verified conspicuity squawk for LFA9 ac] but the other was not squawking. The non-squawking ac was not working Shawbury and was subsequently tracked until it faded from radar NW of Cosford*”. Under the rules of a FIS at JSP 552 235.125.1.b and c, controllers “*may attempt to identify a flight...and are not responsible for separating or sequencing aircraft*”. Although the Squirrel's Mode C would have been verified, APP did not identify the helicopter for monitoring purposes. The controller did, however, monitor the contacts after the Squirrel QHI had brought them to his attention on Stud 4 and before departing the frequency once again to continue his NAVEX. Although the rules also state at JSP 552 235.125.1.d that “*where a controller suspects from whatever source, that a flight is in dangerous proximity to another aircraft, a warning is to be issued to the pilot*”, the helicopter was operating on a quiet frequency in LFA9, in an area of known high traffic density.

HQ PTC comments that although we only have one perception of this event, there seems little doubt that this was a pretty close encounter.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It was unfortunate that the reported ac could not be traced and the Board recognised that with only one input from the Squirrel pilot, even with the ATC account, the picture was very far from being complete. There were valuable lessons to be learned here by the other pilot that was involved and whether or not he was aware of the occurrence will never be known. Some members thought it entirely possible that the other ac was a microlight as some high performance machines are now available with a performance that would outstrip a C172. Clear of the ATZ, civilian pilots can legitimately fly their ac through the Shawbury MATZ with impunity without talking to ATC - even though good airmanship suggests otherwise. Military QHIs conducting flying training within a MATZ should be under no illusions as the MATZ provides little ‘protection’ against the extremely poor airmanship displayed by the other pilot here - though it was pointed out he might not have had a radio fitted to his ac thereby preventing communication with ATC.

Turning to the reporting pilot's view, the Board commended the QHI for his very frank and honest account of this occurrence and members commended the good spot by the student in the first instance. Though it was not readily apparent how experienced the student was, or his level of training, he

AIRPROX REPORT No 183/03

evidently had a better view to starboard from the right-hand seat as the helicopter structure had apparently hindered the QHI's view in this direction from the left seat. Some fast-jet pilot members thought that there was a valuable CRM teaching point here and a salutary lesson to all instructors, to take due cognisance of what the student PNF had said and keep looking out. Moreover, experienced instructor members of the Board opined that it would have been helpful if the QHI had told his student to keep up a running commentary so that he could talk the instructor's eyes onto the other ac and thus acquire it quickly. As it was, the QHI had tried to spot it without success before he finally saw it 150-200m away – from his account this was a very late sighting, which the Board agreed unanimously was the cause. At that range there was little room left for manoeuvre and although the QHI had spotted it in time to turn away robustly, thereby removing the actual risk of a collision, the Board agreed with the reporting pilot that the safety of the ac involved had not been assured by any means.

PART C: ASSESSMENT OF CAUSE AND RISK

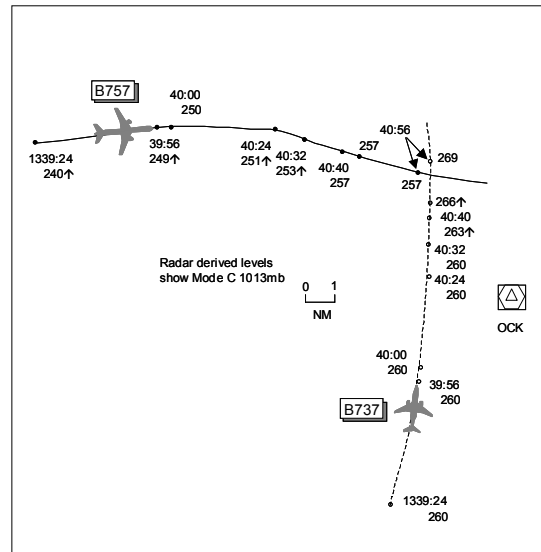
Cause: Very late sighting by the Squirrel QHI.

Degree of Risk: B.

AIRPROX REPORT NO 184/03

Date/Time: 13 Nov 1341
Position: 5122N 0031W (5nm NW OCK)
Airspace: UAR UM185/UL607 (Class: B)
Reporting Ac Reported Ac
Type: B737-200 B757
Operator: CAT CAT
Alt/FL: FL260 ↑FL270

Weather IMC KLWD IMC KLWD
Visibility:
Reported Separation:
 500ft V 500m H 800ft V 5nm H
Recorded Separation:
 600ft 3·4nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE B737 PILOT reports heading 360° at 400kt inbound to Birmingham and in receipt of a RCS from London squawking 5567 with Mode C. Whilst in the vicinity of OCK in the en route descent phase having levelled at FL260, he received a TCAS TA alert immediately followed by an RA “climb” warning, which he complied with. The weather was IMC and they had not received any previous warnings. The conflicting ac was ‘seen’ on TCAS to be crossing traffic, L to R, which was estimated to pass 500m to their L and 500ft below, although the TCAS plot was not monitored closely. The frequency was extremely busy and ATC had responded to their reported TCAS climb.

THE B757 PILOT reports climbing to FL270 heading 090° at M0·795 en route to Cyprus and in receipt of an ATS from London squawking 0367 with Mode C. ATC told him to stop climb at FL250 followed by instructions to turn R onto heading 105° and to climb to FL270. Climbing through FL260, he thought, TCAS gave an RA “descend” warning with conflicting traffic indicating +800ft crossing R to L. He levelled the ac and commenced descent and he told ATC, TCAS gave a “monitor vertical speed” and the descent was stopped at FL258 as the conflict cleared to his L whilst ATC gave an avoiding action descent. The minimum horizontal separation was estimated to be 5nm and he assessed the risk of collision as medium.

ATSI reports that the controller was operating the Central Sector, i.e. Sectors 25/26, with a very inexperienced trainee. He described the combined sector as busy at the time of the Airprox but well within his capabilities. Another controller was available had it been considered necessary to split the sector.

The B737 pilot established communication with the Central Sector, at 1334, reporting descending to FL260 and heading 020°. The controller said that the ac would normally be transferred descending to FL250 but there was conflicting traffic at that level. The flight was instructed to continue on the heading. Two minutes later, the B757 pilot made his initial call on the frequency, reporting climbing to FL120, on radar heading of 135°. The trainee cleared the flight to climb to FL240 and, shortly afterwards, to turn left heading 090°.

At 1338, the trainee, on her own initiative, cleared the B757 to climb to FL270. The mentor said that, as he did not consider this to be a safe clearance relative to the B737 at FL260, he instructed the trainee

AIRPROX REPORT No 184/03

to stop the B757's climb at FL250. She carried out this instruction immediately and the pilot read back the re-clearance correctly. The radar timed at 1338:20, when the B757 was instructed to stop its climb at FL250, shows the subject ac, on conflicting tracks, 23.8nm apart, with the B757 passing FL224. After the B737 was given a track adjustment, with a routeing direct to HEMEL, the pilot of the B757 requested further climb and was instructed to standby. The mentor explained that, realising that the sector was getting busier and bearing in mind the inexperience of the trainee, he decided to take over the RT transmissions. However, he left the trainee sitting at the console and annotating the paper flight strips (PFSs), whilst he sat to the side using the training box.

One of the first transmissions that the mentor made, after taking over the frequency, was to instruct the B757 to *"turn right heading one zero five and maintain flight level two five zero"*. Although this message was passed clearly and distinctly, the pilot erroneously replied *"Turning right one two five climbing flight level two seven zero"*. Neither the mentor nor his trainee noticed the incorrect readback, which was also clearly intelligible. The mentor commented that he would normally ensure that he received a correct read back to an instruction but on this occasion, as he had not issued climb to a new level but was just reiterating a clearance already passed, he thought he may not have been listening closely enough. He agreed that he should also have noticed the incorrect readback of the revised heading. The MATS Part 1, Appendix E, Page 8, states, with reference to the requirement for pilots to read back in full messages containing level and heading instructions, that: *"Errors in a read back must be corrected by the controller until the pilot gives an accurate read back"*. At the time (1339:56), the two ac were 11nm apart; the B757 was passing FL249. The mentor said that he had no reason to doubt that the B757 would not comply with the clearance to maintain FL250. In fact, he recollected that the flight did level at FL250 initially and this was corroborated by the radar recordings, which reveal that the B757 levelled at FL250 for about 24sec, during which time STCA activated. At 1340:32, when the two ac were 4.9nm apart, with the B757 climbing through FL253 and whilst the controller was instructing another ac to climb, the RT recording reveals that a part simultaneous transmission was received. This call was from the pilot of the B737 reporting a TCAS climb. The mentor said that he had not heard this message and reiterated the climb clearance to the other ac. It was only after this that he realised the situation when he heard the pilot of the B757 reporting a TCAS descent and the pilot of the B737 a TCAS climb. He immediately informed the latter that the traffic was *"just in your ten o'clock now"* and instructed the former to *"descend immediately"* to FL120. He explained this was an arbitrary level, with no operational significance, other than to keep the flight descending quickly away from the B737. The B757 reported having passed the traffic and maintaining FL258. As the two ac passed at 1340:56 about 0.5nm apart, radar recordings show that vertical separation was 1200ft. The B757 had levelled at FL257 and the B737 was climbing through FL269, before reaching and maintaining FL270. Minimum separation was recorded at 1340:40 as 3.4nm/600ft, as the B737 climbed through FL263.

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 S25/26T who had been acting as mentor then decided very sensibly to take over the RT transmissions when things started to get busy. Following the request from the B757 crew for a higher level, which the trainee had acknowledged with *"standby"*, he had then 'taken control' and instructed them to turn R onto heading 105° but reiterated the cleared level of FL250. Members understood the Tactical controller's rationale, as he was cognisant of the B757's climb request and the B737's projected crossing track, and it seemed he was just ensuring the situation was clear in his mind that the ac would be maintaining 1000ft vertical separation until they had crossed. However, the B757 crew had read back 125° and that they were climbing to FL270, both of which were incorrect. Members wondered how this could have happened. Normally the CRM procedures utilised on the flight deck ensure that ATC instructions are checked 'cross-cockpit' on receipt, then read back prior to subsequent execution. On

this occasion, for whatever reason, the B757 crew read back the wrong heading and level instructions, which crucially went undetected by the LACC S25/26T. This double sequenced error had caused the Airprox. Following on from this, the S25/26T probably had no reason to doubt that vertical separation had been established and reinforced perhaps when he saw the B757 level at FL 250, albeit temporarily; this brief transition was possibly owing to the ac attaining the level set in the AP 'capture' mode prior to the crew commencing their climb, erroneously, to FL270. Unsurprisingly the B757 crew had next received an RA "*descend*" on the conflicting B737 crossing R to L and, after stopping their climb, had commenced a descent whilst informing ATC. TCAS had then 'softened' its guidance to "*monitor vertical speed*" before clear of conflict was received. Members noted that the Tactical controller had issued an executive instruction to the B757 crew to descend, after the crew had reported TCAS RA manoeuvring. Although unusual it is permissible - MATS Part 1 Supplementary Instruction 3/01 Airborne Collision Avoidance System refers - as the instruction had not been contrary to the declared manoeuvre. Meanwhile, the B737 crew had received a TCAS TA alert, updated then by an RA "*climb*" command on the B757 crossing L to R and had followed the guidance. After informing ATC of their manoeuvre, the B737 crew estimated erroneously that they passed about 500m ahead of and 500ft above the B757. The S25/26T had passed TI to the B737 crew when they had reported the TCAS RA "*climb*" but the other ac was not visually acquired. At the end of the day, both crews had reacted swiftly and effectively to the TCAS warnings and the radar recording revealed a minimum separation of 600ft and 3.4nm 16sec before the CPA occurs when the vertical separation had increased to 1200ft. These positive actions and distances led the Board to agree that any risk of collision had been effectively removed.

PART C: ASSESSMENT OF CAUSE AND RISK

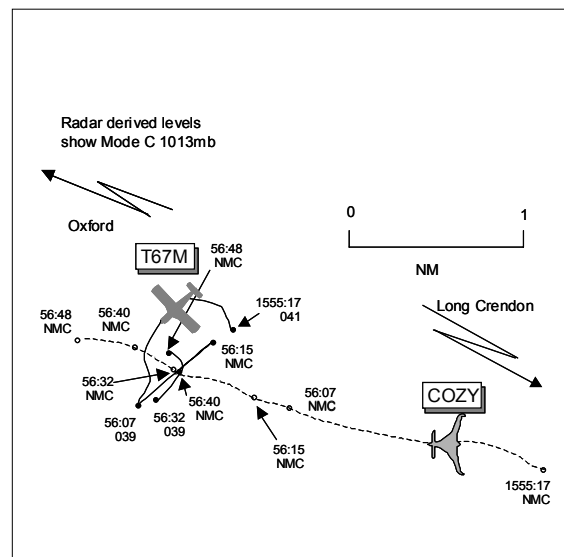
Cause: The B757 crew read back the wrong heading and level instructions, which went undetected by the LACC 25/26 Tactical controller.

Degree of Risk: C.

AIRPROX REPORT No 185/03

AIRPROX REPORT NO 185/03

Date/Time: 15 Nov 1556 (Saturday)
Position: 5147N 0106W (9nm SE Oxford Airport)
Airspace: OXFORD AIAA (Class: G)
Reporting Ac Reported Ac
Type: Cozy T67M
Operator: Civ Pte Civ Pte
Alt/FL: 4000ft AEROS
(RPS 1009mb) (QNH)
Weather VMC CLBC VMC CLOC
Visibility: >30nm 20km
Reported Separation:
nil V 100-150ft H 100m V 300m H
Recorded Separation:
0.2nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE COZY PILOT reports heading 298° at 125kt enroute from Denham to Shobden at 4000ft QNH 1009mb and in receipt of a FIS from Brize RADAR on 124.27MHz squawking 7000 with Mode C. The visibility was >30nm below high stratus cloud in VMC and the ac was coloured white with wing-tip strobe lights switched on. About 10nm E of Oxford Kidlington flying straight and level into a partially obscured low setting sun, he saw an ac 5nm ahead of his projected track carrying out aerobatics on a N-S axis. It was seen to complete 2 loops and he watched it continuously as it was in potential conflict. Its final manoeuvre (another loop) caused it to descend towards his ac so to make his ac more visible and to increase separation he made a steep R turn (>60° AOB). On rolling out of the turn, he saw the other ac pass about 100-150ft behind his ac at the same level. He was certain the other pilot had not seen his ac but must have flown through his slipstream. He assessed the risk of collision as 'certain'.

THE T67M PILOT reports flying a solo aerobatic sortie from Oxford and in receipt of a FIS from Oxford on 133.42MHz squawking 7004 with Mode C. The visibility was 20km in VMC and the ac was coloured white/orange/red with anti-collision and strobe lights switched on. The incident occurred shortly after executing a negative humpty bump followed by a stall turn on a N-S axis over a wooded area just W of the M40 motorway, he thought. The -ve humpty bump comprised of a vertical climb, started from the horizontal with the nose pointing S and canopy upwards, followed by pushing the nose forward at the top of the climb to enter a vertical dive before pulling up to the horizontal again southbound and canopy upwards. This was followed by a stall turn entry and recovery after the turn at the top roughly northbound. Once established on the 'down line' from the stall turn he saw another ac, a white coloured canard type with a rear facing engine, below and 300m ahead, slightly to his L on a SW track, he thought. It was already in a R turn onto a more northerly heading, presumably as it was taking avoiding action, he turned to his R, estimating that he passed 100m above and 300m behind the ac. The other ac was not receiving a service from Oxford ATC who was aware that he was carrying out general handling to the E of the aerodrome between 4000ft and 5000ft. Furthermore he was aware that this was only an information service and ATC were not responsible for separation. The light had begun to fade and that had not helped the visibility and his speed had varied from 0-120kt during the aerobatic sequence. He had been tracking southbound for a relatively long time whilst the other ac had been tracking towards his position and, as he had spent a long time in the vertical plane, the closing speeds had been relatively high. Also, the other ac was probably too far away to see during his clearing turns prior to starting the aerobatics. He assessed the risk of collision as medium to low.

MIL ATC OPS reports that all timings in this report are UTC however it has not been possible to correlate radar and RT timings.

The Cozy contacted Brize Norton LARS controller at 1549:59 "*....out of Denham for Shobden....*". The ac was placed under a FIS and instructed to "*....climb at your discretion....*". A squawk was allocated as the ac passed N abeam Benson at 1552:42 and the pilot advised that he was "*....changing to Gloucester....*" at 1611:44. No mention of an Airprox is made.

Analysis of the Cleve Hill Radar video recording shows the Cozy in the Long Crendon area tracking in a westerly direction at 1554:00. It continues to track just to the N of the Benson MATZ stub before altering course slightly right apparently to pass to the N of Oxford. The Slingsby T67 can be seen manoeuvring to the N of Benson (on the western corner of the MATZ stub) indicating between FL039 and FL041 and is in direct conflict with the Cozy.

Notification of Mil ATC involvement was received 10 days after the incident. Brize were immediately contacted however after that length of time collective memories could not recall anything unusual consequently Controllers' Reports have not been completed. FIS is a non-radar service provided for the purpose of supplying information useful to for the safe and efficient conduct of flight. Such information includes details about weather, serviceability of facilities, conditions at aerodromes and any other information pertinent to safety. Controllers are not responsible for separating or sequencing ac however if it is suspected that a flight is in dangerous proximity to another ac then a warning should be issued to the pilot. It is accepted though, that a controller cannot assume responsibility for the issuance of relevant TI at all times because of higher priorities equally so, the accuracy of such information cannot be assured. On this occasion it does appear that the LARS controller was particularly busy. However, with the Cozy on a directly conflicting track with an ac displaying an aerobatics squawk it would have been pertinent to issue a warning to the Cozy pilot. All Military Controllers will be reminded of their 'Duty of Care' obligations in the next 'Readback' publication.

UKAB Note (1): Met Office archive data shows the Cotswold RPS 1500-1600 as 1009mb and the QNH for Benson as 1012mb.

UKAB Note (2): Analysis of the Cleve Hill radar recording at 1555:17 shows the Cozy 10.5nm SE of Oxford tracking approx 280° squawking 3711 but with NMC indicated. The T67M is 2nm ahead of the Cozy manoeuvring in a L turn passing through heading 340° squawking 7004 indicating FL041 (3980ft RPS 1009mb). Whilst the Cozy continues on an almost steady 280° track the T67M is seen to cross ahead of the Cozy R to L before reversing its track at 1556:07 indicating FL039 (3780ft RPS). The T67M crosses ahead of the Cozy L to R before fading at 1556:15 with the Cozy 0.4nm to its SE. Sixteen seconds later CPA occurs as the T67M reappears, in the Cozy's 9 o'clock range 0.2nm indicating FL039 (3780ft RPS). The next radar sweep shows the T67M crossing through the Cozy's 6 o'clock range 0.3nm, both ac showing NMC.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

This had been an encounter in the FIR with equal responsibility on both pilots to 'see and avoid'. Although the T67M pilot was engaged in aerobatics, the opportunity was there for him to detect the approaching Cozy, albeit a small target, when he cleared the area into which he would be manoeuvring. The Cozy pilot had visually acquired the T67M ahead at 5nm range and had watched it doing aerobatics yet he had continued to close the distance as he flew on track. Some members thought that a slight heading change executed early by the Cozy pilot would have displayed good airmanship, showing appreciation of the difficulties faced by the T67M pilot conducting a continuous series of manoeuvres in terms of

AIRPROX REPORT No 185/03

normal lookout. Eventually the subject ac came into conflict, the Cozy pilot executed a steep turn to the R, albeit late, which resolved the deteriorating situation; he estimated that the T67M had passed 100-150ft behind his ac at the same level. The T67M pilot didn't see the approaching Cozy until late when it was below, 300m ahead, and on seeing that it had already commenced an avoiding action R turn, he turned R and passed 300m behind and 100m above the Cozy. The radar recording shows the CPA occurred when the T67M was abeam the Cozy by 0.2nm (370m) before it passed through its 6 o'clock position. The Cozy pilot had monitored the T67M's movements and had always been in a position to take further action should it have been necessary. These elements, when combined, were enough to persuade the Board that safety had been assured during the encounter.

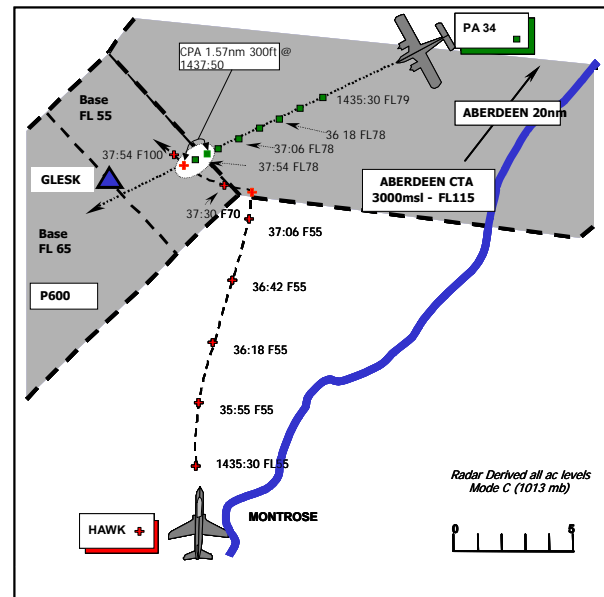
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict resolved by the Cozy pilot's late actions.

Degree of Risk: C.

AIRPROX REPORT NO 186/03

Date/Time: 24 Nov 1437
Position: 5657N 00245W (GLESK 22NM SSW Aberdeen)
Airspace: P600 (Class: A)
Reporter: ScACC
First Ac Second Ac
Type: PA34 Hawk
Operator: Civ Trg HQ PTC
Alt/FL: FL80 FL55
(1013 mb) (N/K)
Weather VMC Below CI VMC CLOC
Visibility: >5km NR
Reported Separation:
1nm H 0 V NR
Recorded Separation:
1.57nm H 300ft V

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

THE SCACC CONTROLLER reports that he observed a Hawk showing intention code M4, flying S of a PA34 that was last seen at FL53, leaving the Aberdeen Zone for P600. Subsequently he noted that the Hawk had turned on to a W track and was indicating FL70 climbing, about 1nm S of the PA34. He passed rapid TI to the PA34, as no avoiding action was possible and the PA34 obtained immediate visual contact with the Hawk.

Subsequent enquiries revealed that the ac was actually callsign 3, he thought, and was not in contact with Scottish Military Controller 4, although he was wearing the correct 4646 squawk. [UKAB Note (1): See Mil ATC report; he was in communication with the Allocator.]

[UKAB Note (2): Since there was a large military training mission taking place at the time of the incident it was difficult to establish positively the identity of the ac involved in the incident. Following extensive inquiries however, it was established that it was the No 4 ac from a formation of Hawk ac, detached from RAF Valley to RAF Lossiemouth, to participate in the Exercise].

THE PA34 PILOT provided a very brief report. While flying an instrument flying instructional sortie from Perth the ac was heading 225° at 140kt and level at FL80 in Airway P600, under the control of ScACC and squawking with Mode C, just SW of GLESK. The student was flying the ac with the screens up, and the instructor first saw an F3 (she thought) climbing through their level 1nm ahead of them from left to right. She took no avoiding action as none was required and assessed the risk as being low.

THE HAWK PILOT reports that on the day of the incident he was flying as No4, using callsign 4 in a 4 ac formation taking part in a COMAO [UKAB Note (3): A COMAO is a COMBined Air Operation, a very large and extended formation consisting of several elements, normally of 4 ac each] as a notified military training exercise. Towards the end of the sortie an incident occurred involving him and a Scottish Mil controller. (All times approximate)

The formation took off at 1350 from Lossiemouth and flew a high-low-high profile to attack a target in the N of England. On egressing from the target area he was engaged by another a pair of Hawks approximately 25nm S of Bell Rock. As a result of this engagement he became separated from the rest

AIRPROX REPORT No 186/03

of his formation and low on fuel. He had just sufficient fuel to fly a minimum fuel profile from Bell Rock to Lossiemouth, taking into account the extra fuel required to cross the airway P600. As he climbed out from low-level he planned to level off at FL55 (the lowest base of the airway) until he could get a radar service from Scottish Military, then climb to FL100 to fly a direct track to Lossiemouth at an IAS of approximately 300kt.

As he climbed to FL55 at Bell Rock (31nm or over 6min flying time from P600) he selected the Scottish Mil frequency and it was very busy as the rest of the package (including his element lead callsign 3) were climbing out and several were in a similar fuel critical situation. It took at least 2 attempts to be heard by Scottish Mil, his first transmission was made around 1444 at a position 5nm SW of Montrose (18nm to the Airway) with which he was visual, heading 340°. He remained on that heading, VMC and navigating visually with the ground. The controller was very busy, so he remained patient and received a reply at around 1445 and was told to 'wait'. Eventually, at approximately 1446 he received a squawk from the controller, but nothing else; this was at a position 2nm NW of Brechin (3nm outside the E boundary of P600). Being mindful of his fuel he continued on the same heading at FL55 VMC, although by now cloud prevented him from seeing the ground. He expected a radar service to be declared by the controller, but none came and at 1448 he became concerned so he prompted the controller for a radar service. The reply came back immediately as 'Radar Control' and he was told to take avoiding action onto a heading of 270°. As he was VMC at this stage he performed a 5g turn on to 270°, maintained FL55 throughout the manoeuvre and saw no other ac. As he could not see the ground he could not be sure of his position; however, he believed that his heading would keep him clear of the Aberdeen Zone and his FL of 55 would keep him clear of P600.

After approximately 1 minute the controller changed the service to a RIS and 'own navigation' to Lossiemouth and he came on to a heading of 350° and climbed to FL95, which was a FL that he deduced from RT was not being used by any other formation. He was aware that there were many ac from the package in his immediate area, although he did not see any of them.

[UKAB Note (4): The recording of the Aberdeen Radar and Scottish RT frequencies show that the Hawk did not commence a climb above FL55 until cleared to do so by the Scottish Military Controller. Had he not been given the avoiding action left turn on to 270° the ac would have entered the Aberdeen CTA; however the avoiding action turn, and its subsequent 5g implementation, reduced the CAS infringement to an insignificant amount which was not pertinent to the circumstances of the Airprox. It was the climb of the Hawk from FL55 to FL100, authorised by the Scottish Mil Controller at 1437:20 in the same transmission, that brought it into conflict with the PA34].

MIL ATC OPS reports that the subject Hawk was participating in a large fast jet exercise in N Scotland. The pilot free-called ScATCC (Mil) Allocator (ALLOc) at 1435.25 "...looking for direct track RTB Lossiemouth". The ALLOc instructed the pilot to "...squawk four six four six". which was read back at 1435:42. Thirteen seconds later the Hawk pilot reiterated the squawk and passed his estimated position and level as "...five miles west of Montrose flight level five five". The Hawk was then instructed to "standby" by the ALLOc whilst he transferred an ac to another frequency. This process was protracted due to the pilot requesting confirmation of his type of radar service. The ALLOc then received a series of calls from ac free-calling for radar service or going off frequency. At 1437:10 the Hawk pilot transmitted "...requesting a radar advisory service and climb to flight level one hundred". The ALLOc advised "...identified, avoiding action turn left heading two seven zero, climbing flight level one hundred", the pilot acknowledged the avoiding action turn and the ALLOc changed the Hawk's type of service to "...radar control as you enter controlled airspace" at 1437:29. At 1438:10 the ALLOc called "...traffic six o'clock three miles tracking south indicating flight level seven five climbing". to which the pilot responded "...copied" the traffic, later identified as the PA34, at 1438:19 and made his final call at 1438:28 when given "...own navigation Lossiemouth".

Analysis of the Aberdeen Radar video recording first shows the Hawk at 1435:11 tracking NNW, non-squawking. Just under a minute later, Mode A 4646 is observed with Mode C indicating FL056 and at

1436:10 code callsign converts to STN 02 with Mode C indicating FL055. The Hawk enters the Aberdeen CTA at 1437:24 with Mode C indicating FL053 and at 1437:35 it is observed initiating a hard left-hand turn onto a W track with Mode C indicating FL062 and at 1437:41 it steadies on a W track with Mode C indicating FL070.

The Exercise planners had briefed the ScATCC (Mil) Supervisor that the Exercise would take place to the SE of Aberdeen. It was planned that the ac would depart silently from Lossiemouth and route VFR round the N end of the Aberdeen CTA and P600, before free-calling an E3D ac. They would recover the same way and had slot times at Lossiemouth to spread the recovery. In the event, almost all the Exercise ac free-called ScATCC (Mil) for recovery through P600 from E of Leuchars/S of Aberdeen, for direct routing through P600, with many ac being short of fuel. The ac called within a relatively short period of time from CAS and many were within the mandated minimum of 5 minutes flying time from CAS. Furthermore, the pilots continued to route toward CAS when not yet under a radar service.

The Hawk was issued a squawk but had to wait 2 minutes to be identified due to the ALLOC's workload. In that period, 4 other ac either free-called or were already being dealt with by the ALLOC. When the Hawk was identified, the ac was entering the Aberdeen CTA. The avoiding action turn was the most expeditious; however, the conflicting PA34, was obscured by another SSR label. The ALLOC could not reduce the radar's range due to the wide diversity in the position of free-calling ac nor could he rotate the SSR labels, as his immediate priority was to turn the Hawk away from CAS. In retrospect, it would have been better for the Supervisor to open the Planner position earlier to help reduce the ALLOC's workload. However, the recovery was not expected to work ScATCC (Mil) and as it was, the Planner position was opened as soon the traffic intensity started to increase. By the time the controller was in place the incident had already occurred. Opening Console One would have also reduced the workload placed on the ALLOC. The console one controller sits adjacent to the ALLOC and this would have sped up handovers, were Controller One to be used as the ALLOC load-off, again reducing the ALLOC's workload. This had been done during similar fast jet exercises previously and not to do so here was an error of judgement by the Supervisor. However, this was not a direct cause of the incident.

The ALLOC 's workload was such that he was unable to handle safely the amount of ac free-calling for a service. This was compounded by pilots calling too close to CAS and maintaining their track towards it even though they were not identified or under a radar service.

The ALLOC and Supervisor have, both, been fully debriefed on the incident and the appropriate action has been taken.

ATSI endorsed the ScACC report which stated that the PA34 was on an IFR training flight from Aberdeen to Dundee via airway P600 at FL80. The Hawk was one of a group of ac recovering to Lossiemouth from an exercise over the North Sea. The incident occurred within CAS in airway P600 in the vicinity of position GLESK, to the SW of the Aberdeen zone.

The Tay controller climbed the PA34 to FL80 on transfer from Aberdeen and it was on its own navigation to intercept the centreline of P600 at GLESK. Although not relevant to the incident, it is noted that the PA34's Mode C readout varied between FL77 and FL79, and never reached FL80; at the CPA the PA34's Mode C read FL78, and the Hawk's Mode C read FL81.

In the lead up to the incident, the Tay controller made several telephone calls to the ScACC Military Allocator to query the intentions of the recovering ac with regard to potential conflict with the PA34. Some of the ac were displaying ScACC code callsign converted labels, whilst others were displaying raw ScACC military squawks.

The radar recording shows the Hawk tracking N at FL52, E of airway P600 and approximately 12 miles to the south of the PA34, with civil jet traffic outbound from Aberdeen overtaking and climbing above the PA34 on the airway. If the Hawk had continued its N track, it would have passed safely behind both civil

AIRPROX REPORT No 186/03

flights, but close to the PA34. However as the Hawk approached the S edge of the Aberdeen Zone he turned hard left onto a W track into airway P600, across the nose of the PA34, climbing rapidly through its level. The Hawk passed horizontally between the PA34 and the civil jet which was at least 6000ft above it at the closest point.

STCA activated at 1437:41 when the PA34 indicated FL78 and the Hawk at FL70 commenced its sharp turn into the airway across the PA34's track. Given the Hawk's sudden 90° turn to the left across the nose of the PA34, the Tay sector controller was in no position to provide the pilot with any meaningful avoiding action. The Tay controller reacted rapidly to the conflicting turn and climb by passing essential TI to the PA34 pilot, who acquired the Hawk visually and judged there to be no risk of collision. SMF shows minimum separation to have been 1.57nm/300ft.

HQ PTC comments that both the Hawk pilot and the ScATCC (Mil) controllers found themselves in a difficult position caused by the unplanned break up of the COMAO. The Hawk pilot was doing his level best to behave responsibly, given his shortage of fuel and paucity of nav aids. Only hindsight shows that the avoidance action given by the ScATCC (Mil) Controller was not the best but had the Hawk remained on his northerly hdg he would have certainly penetrated the Aberdeen CTA with unpredictable consequences. The planning aspects of this exercise are not ours to address.

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.

At the time immediately before the Airprox the Hawk pilot found himself in an awkward situation both short of fuel and unable to obtain a radar service quickly. He did however, have the option to declare a Pan or to divert to Leuchars if his fuel situation warranted it, rather than to 'press on'. Although Members understood the apparent pressure to dismiss both these options, it may have been more prudent to afford them more consideration rather than get his ac into a 'corner that it was difficult to get out of' both for himself and the controller (without remaining at a lower alt which would have meant a higher fuel consumption).

The reason that he found himself short of fuel on recovery was considered by Members to be predictable both by the pilot himself and by the exercise planners/controllers. Planning the return from a fighter engagement area to Lossiemouth by taking a relatively long track round the North of the Aberdeen CAS, was not thought wise. Specialist Members considered that crews would always try to get the most out of the training until the last possible time consistent with a minimum fuel straight line recovery, which is precisely what happened. Since this was considered predictable, Members considered it remiss of the Exercise Controllers not to warn ScATCC (Mil) that the straight line recovery scenario was probable thus allowing them to man accordingly. Further, as witnessed by this and previous Airprox, an ATC liaison officer on the Exercise Control staff can be a prudent safety precaution in many cases. HQ STC agreed to discuss this incident with the exercise planning agency.

Notwithstanding that the TDBs of the PA34 and the ac above it on the airway overlapped, ATC members considered that the ScATCC (Mil) Allocator should have been aware of its presence. In mitigation however, he was working under extreme pressure at the time to the extent of being overloaded. Had he been aware of the PA34 he would probably not have instructed the Hawk to climb. Members thought that the fact that not all ac were code/callsign converted and the Hawk displayed an incorrect callsign on the SSR label had not contributed to the incident directly but was further evidence that the ScATCC (Mil) was operating under considerable pressure.

Members discussed the use of the 'avoiding action' terminology to avoid airspace rather than another ac. Although this was not considered correct by civil controllers, it is sometimes done by military controllers and was thought to be justified in this case as ScATCC (Mil) do not have authority to control ac in the Aberdeen CTA.

Whereas the Hawk pilot did not see the PA34 the reverse was true. Assisted by accurate TI from ScACC (Civil) the captain of the PA34 saw the Hawk cross through her nose at a distance of 1nm and considered that no avoiding action was required; Members considered therefore that there was not a risk of collision.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Unaware of the PA34, the ScATCC (Mil) Allocator cleared the Hawk pilot to climb through its level.

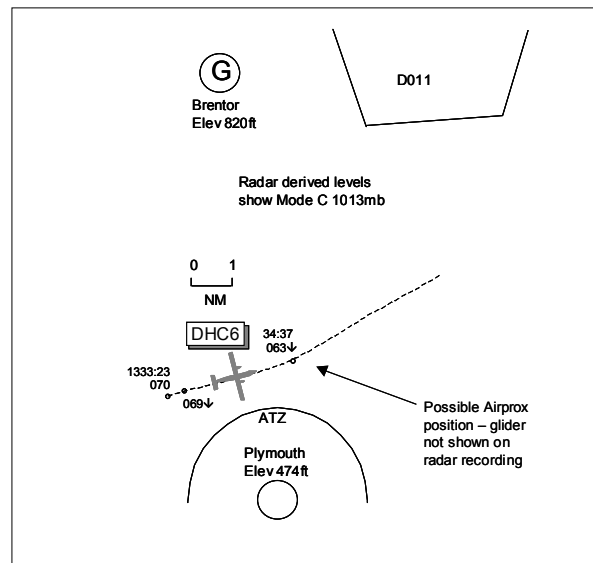
Degree of Risk: C.

Contributory Factors: The ScATCC (Mil) Allocator was working in an overload situation.

AIRPROX REPORT No 187/03

AIRPROX REPORT NO 187/03

Date/Time: 18 Oct 1335 (Saturday)
Position: 5029N 0405W (4nm N Plymouth Airport)
Airspace: FIR (Class: G)
Reporting Ac Reported Ac
Type: DHC6 Twin Otter VENTUS Glider
Operator: CAT Civ Pte
Alt/FL: FL70 c6000ft (N/K)
Weather VMC CLNC VMC CLAC
Visibility: >10km 50km
Reported Separation:
nil V 500-1000yd H not seen
Recorded Separation:
NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE DHC6 TWIN OTTER PILOT reports en route to Exeter in the cruise heading 070° at 140kt and FL70, he thought, in good VMC and in receipt of a RIS from St. Mawgan. About 5 nm N of the PY NDB (Plymouth), he, the Capt and PNF, was given TI on a pop-up contact in his 10 o'clock range 4-5nm. Both he and his FO adjusted their lookout to try and establish a visual ID of the traffic. The FO saw it first and pointed it out to the Capt, who reported the sighting to ATC. During the RT call, he heard the FO exclaim and he felt the ac bank L and he returned his lookout ahead. The FO had seen a glider in their 1 o'clock about 1000-1500yd away in a L turn passing through a heading of about 280° at a similar level and had taken avoiding action. This turn was continued until they were sure that the glider's turn was taking it clear down their RHS; about a 30° heading change had been required. The Capt then saw the glider, a white single seat type, its R rear quarter was visible as it cleared away in his 0230 position passing through a heading of 130° diverging. No identification marks were observed and he estimated the CPA had been 500-1000yd. He contacted Brentor Base, the nearest gliding club, on frequency 130.1MHz and received confirmation that there was gliding activity in the area, which he passed on to St Mawgan ATC, as well as his intention to file an Airprox.

THE VENTUS GLIDER PILOT reports gliding in easterly wave conditions from Brentor at 50kt and listening out on frequency 130.1MHz. The visibility was 50km above 1 okta of rotor cumulus cloud at 2000ft. No ac were seen above 4000ft except for other gliders which were in the region, up to about 5000ft. The subject DHC6 Twin Otter was not seen during his flight.

UKAB Note (1): The Ventus pilot provided the UKAB with a GPS and barograph log of the flight. The GPS track log shows the glider in the area to the N of Plymouth manoeuvring whilst the barograph reveals the glider's altitude had varied between 6000ft and 6500ft during the period of the Twin Otter's transit of the area.

THE DHC6's COMPANY reports that Brentor Gliding Club have been contacted and requested to advise Plymouth Military and St Mawgan when they are actively gliding. Company aircrew have been advised of a possible risk especially with winds that allow ridge soaring and that produce standing waves (easterly).

MIL ATC OPS reports that the DHC6 was in receipt of a RIS from RAF St Mawgan Approach Controller (APP). The flight had requested and been given descent clearance at 1334:01 to FL 50 when, just under a min later, TI on *"..... pop-up contact left 10 o'clock....3 miles manoeuvring no height"* was passed at 1334:58. The contact was recalled at 1335:10; *"....pop-up contact in your left 10 o'clock now range of 2 miles manoeuvring no height"*. The DHC6 pilot reported that he was visual with the traffic at 1335:15 however 14 seconds later (1335:29) he reported that they had *"...just passed a glider at er 70 obviously out of Brentor in wave"*. APP advised that he had *"...just got a contact is that the northerly contact to you about a mile"*, thereafter followed a discussion trying to correlate the visual and radar pictures. At 1335:46 APP confirmed that he had *"...just got an intermittent contact to the north just popped up but I called it but nothing showing to the south"*.

Analysis of the Burrington SSR video recording shows the DHC6 transiting to the N of Plymouth but, as the primary radar was out of service, no conflicts are observed on radar.

It is apparent that APP was endeavouring to provide the best service possible under the terms of RIS and, although not aware that gliding was taking place at Brentor, elected to call a weak, intermittent contact that had popped up to the N of the DHC6's track. Although this was the correct course of action it may well have had the unfortunate effect of drawing the DHC6 crew's attention away from the traffic to the S. The latter traffic did not show on radar and therefore could not be called. Consequently there are no controlling aspects to this incident. Nevertheless, prior notification of glider activity from Brentor would undoubtedly be useful and the Unit is taking staffing action to try and establish formal notification arrangements between them and Brentor Gliding Club.

UKAB Note (2): Met Office archive data shows the Plymouth QNH as 1013mb.

UKAB Note (3): The Burrington SSR recording shows the DHC6 squawking 0454 4nm NW of Plymouth tracking 075° commencing descent from FL70 shortly after 1333:23. This would suggest that the RT transcript times are more than 45sec ahead of UTC. No other ac are seen in conflict, owing to the absence of primary radar on the recorded radar source. A L turn by the DHC6 is observed 4nm N of Plymouth at 1334:37 as the ac descends through FL063 and then steadies on a track of 055° 8 sec later which is believed to be the avoiding action manoeuvre described by the DHC6 crew.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

This incident occurred in the open FIR, Class G airspace, with both crews responsible for 'see and avoid'. The Ventus glider had been making the most of the good wave conditions prevalent at the time over Dartmoor whilst the DHC6 had been in receipt of a RIS from St Mawgan. The route flown by the DHC6 crew took the ac close to the notified Glider site at Brentor although gliders could be encountered anywhere in the FIR particularly during favourable soaring conditions and when carrying out cross-country flights. The DHC6 crew had been given TI on a conflicting ac, another glider, in their 10 o'clock which had been seen. Very shortly thereafter, the FO saw the subject Ventus, which was not showing on primary radar, in their 1 o'clock 1000-1500yd away at a similar level. This was a commendably good spot of a glider, which are notoriously difficult to see. Immediately, the FO turned the DHC6 L to avoid the glider that had right of way; he watched it in its L turn until it had cleared away about 500-1000yd to their R on a diverging course. Even though the Twin Otter had gone unsighted to the Ventus pilot, the early visual acquisition of and swift actions taken by the DHC6 pilot led the Board to agree that the DHC6 crew had resolved this conflict and that any collision risk had been effectively removed.

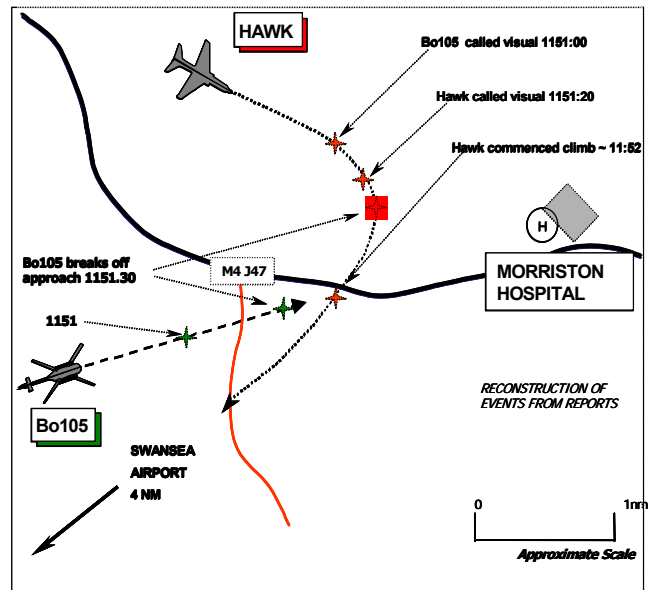
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in the FIR resolved by the DHC6 pilot.

Degree of Risk: C.

AIRPROX REPORT NO 189/03

Date/Time: 21 Nov 1151
Position: 5150 N 00400 W (8nm NE Swansea)
Airspace: London FIR (Class: G)
Reporting Ac Reported Ac
Type: Bo 105 Hawk
Operator: Civ Com HQ PTC
Alt/FL: 1200ft 500ft agl
 (QNH 1008 mb)
Weather VMC CLOC VMC CAVOK
Visibility: >10km >10km
Reported Separation:
 500m H 0 V 700yd H
 Slightly above
Recorded Separation:
 NR

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

THE BO 105 PILOT reports flying a Red and Green Air Ambulance with nav lights, anti-collision lights, HISL and landing lights switched on, squawking 0020 with mode C in receipt of a FIS from Swansea. While 8nm NE at 1200ft QNH heading 060° at 100kt on an approach to Morriston Hospital having picked up a patient from an incident 10nm to the SW, he saw a Black Hawk ac approx 1000ft below at a range of 2nm turning across his nose from left to right. He had heard the Hawk talking on Swansea Approach and report his ALT as 4000ft. He aborted the approach and reported that the Hawk passed 500m ahead of him and flew directly over the hospital helipad. He assessed the risk of collision as being high.

[UKAB Note (1) The reported position (8nm NW Swansea is 1.5nm to the NE of Morriston hospital. The airspace in the area is class G with no restrictions/warnings notified on either the civil or mil VFR charts. Further, Morriston Hospital is not listed in the UK Mil AIP at 1-2-7-5 as a 'Medical Establishment' to be avoided by 2000ft or .25nm]

THE HAWK PILOT provided a most comprehensive report including detailed (1:50000) maps showing the incident as taking place 5km W of Morriston hospital near the M4 motorway Junction 47 where the terrain height is 330ft; the map showed 3 ground features which he identified as flying over, correlating with various transmissions/actions. The closest his ground track came to the hospital was 3.5km SW. He reported flying a Black Hawk TMk1 ac on a singleton instructional sortie with a student in the other seat squawking 7001C and in contact with and receiving an FIS from Swansea. He had advised Swansea that he was 10 nm NE of the airfield requesting a practice diversion following a simulated a bird strike and that he was climbing from low-level to 4000ft for a low-speed handling check. Following the call he initiated a right turn and descended heading towards the airfield.

While turning right on to a heading of S at 380kt and descending slightly he saw a helicopter in his 2/3 o'clock slightly high at a distance of 1000yds. He continued turning but at a reduced rate to remain visual with the helicopter which passed through his 4/5 o'clock and he levelled his wings on a heading of 220°. When the helicopter was in his 4-5 o'clock he informed Swansea that he was visual with the helicopter and that he was climbing to 3000ft to commence the approach. The helicopter advised Swansea of being visual with the Hawk and that he was repositioning for an approach to 'the hospital'.

AIRPROX REPORT No 189/03

Although he was in radio contact with Swansea he had no recollection of being advised of the helicopter traffic.

The minimum separation between the ac in his estimation had been 700yd while they were co-height at 600ft AGL (930ft AMSL). Although he had spotted the helicopter late, he had maintained continuous visual contact with it throughout and therefore there had been no risk of collision.

With hindsight he thought that he could have passed more accurate details of his position to Swansea that may have allowed the helicopter to acquire him visually at a slightly earlier stage.

STATION COMMENTS It will be interesting to gain a better understanding of the geometry of this incident from the helicopter pilot.

The Hawk pilot is confident that there was no risk of collision but would have been better advised to have called that he was pulling up from low level and climbing to 4000ft.

Transcripts from the ATC tapes would help to resolve exactly what was broadcast by all the parties.

UKAB Note (2): The transcript of 119.7 (Swansea Approach/Aerodrome) shows the following:

At 1149 Hawk 'callsign is a Hawk two POB with a simulated birdstrike er currently North of the field by eight miles tracking to the South looking to carry out a low speed handling check just South of your field by about one mile'

Swansea 'roger at what level'

Hawk 'climbing one thousand er correction four thousand callsign'

Swansea 'callsign roger flight information service no reported traffic to affect Swansea QNH one zero zero eight'

Hawk 'request your QFE'

1149.30Swansea 'QFE callsign niner niner niner'

Hawk 'Niner niner niner request QFE heights and er after the low speed handling check will be carrying out a powered approach for go-around'

Further conversation not relevant to the Airprox follows until:

1151.00Helimed 'Er Swansea Approach callsign is the er Hawk that's just approaching er Morriston aware of our existence'

Swansea 'he's at four thousand feet at the moment'

Helimed 'he isn't he's at my height just climbing above me'

Hawk 'er callsign yeah we're visual with the helicopter just climbing to four thousand feet'

1151.30Helimed 'Er Swansea Approach Er callsign just for information we've had to abort our approach to er Morriston hospital going round for another approach on account of that jet'

Swansea 'Understood er he was er first call he informed he was climbing to four thousand feet'

Hawk *'callsign were three thousand feet apologies to the helicopter'*

UKAB Note (3): The precise geometry of this incident is hard to determine. The Bo 105 pilot reports first seeing the Hawk *'slightly below and in front of the helicopter turning from left of helicopter's nose to head on'*. Later in his report the Hawk was reported as first sighted at *'approx 1000ft below at about 2nm'*. The Bo105 pilot's descriptive diagram however shows the Hawk as crossing from the 9 o'clock through the 12 o'clock in a right turn, crossing his nose at a range of 500m, **100ft** below and departing in his 3 o'clock climbing. The Hawk pilot reports sighting the Bo105 at 1000yd in his 3 o'clock and reducing his turn rate to pass slightly below at a range of 700yd and rolling out on a heading of 220°. Using all this information the diagram above, although it cannot be guaranteed as being accurate, is a distillation of the distances contained in the 2 pilots' reports. However, it appears the Bo105 pilot's estimation of the Hawk being 1000ft below him is in error as it does not correlate with any other information and would mean that the Hawk was below ground level ((1200-330)-1000 = -130ft).

ATSI reports that the B105 was in contact with Swansea ADC/APP, routeing from a position 2.5nm W of the airport to Morrision Hospital, situated to the N of Swansea. No altitude was given, although the pilot later reported at 1200ft at the time of the incident. Approximately three minutes later the Hawk contacted the frequency, reporting carrying out a simulated bird strike. The position given was 8nm N of the airport, requesting to carry out a low speed handling check about 1nm S of the airport. The pilot reported climbing to 4000ft on 1004mb, was informed that a FIS was being provided, with no reported traffic to affect, and was passed the QFE 999mb. Acting on the assumption that the Hawk was climbing to 4000ft, well above the B105, no traffic information was passed to either ac. Approximately 2min after the Hawk pilot had reported climbing to 4000ft, the B105 pilot commented about a Hawk climbing through his altitude. The Hawk pilot reported visual with the helicopter.

It is understandable why the controller believed that the Hawk would have been at 4000ft, as the pilot had reported climbing with a simulated bird strike almost 2 min before the Airprox. Nevertheless, he did not seek or receive any confirmation of the ac's actual altitude at any time. Consequently, he did not appreciate the potential confliction between the subject ac and, as a result, appropriate TI was not issued.

HQ PTC comments that there are some inconsistencies between the 2 pilot's reports that make it difficult to be unequivocal. We are conscious that, while engaged on a HEMS mission and needing to acquire the HLS and maintain awareness of the welter of power lines in the area, the intrusion of the Hawk was a further distraction the helicopter pilot could well have done without. However, the Hawk pilot's report is credibly precise and corroborated both by the tape-transcript and (presumably) the student's recall of the incident. This persuades us that the Hawk pilot saw the helicopter in sufficient time to give it a wide enough berth consistent with the completion of his exercise. However, had the HLS and it's nature been on his LFC and had he been told that there was a HEMS ac inbound to it (instead of being told "no reported traffic") then, perhaps he might have been able more to compromise his own purpose.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

In this case both ac were operating legally in Class G airspace, each pursuing their own dissimilar activities. The Hawk would have presented an unwelcome distraction to the Bo105 pilot who was on his approach to land at the Hospital HLS. Although the Hawk crew did not portray their intentions accurately to Swansea, it had little direct bearing on the incident other than confusing the picture, both to the Bo105 pilot and to Swansea ATC. Members recognised however, that the QFI was instructing a student and that the RT transcript does not show which transmissions were made by which

AIRPROX REPORT No 189/03

crewmember. In this, as with all instructional sorties however, the QFI had overall responsibility for ensuring that accurate and informative messages were transmitted to outside agencies; in this case he could have done more to ensure that this responsibility was fulfilled.

Although neither ac showed on the radar recording, the pilots' estimates of the lateral miss-distance were similar and Members assessed that the ac had passed about 600m from each other with some vertical separation. Further both pilots had seen the opposing ac throughout the encounter. This being the case, they considered that there had not been a risk of the ac colliding.

The Board was informed that, although Morriston Hospital is not marked on the Military Low Flying Charts this had no bearing on the incident since Medical Establishments attract only a .25nm avoidance and, in this case, the Hawk passed well over 1nm away. In order to increase awareness of the presence of the hospital however, OC MFAC Sqn agreed to consider the case for including it in the list of Medical Establishments in LFA 7 in the Mil AIP.

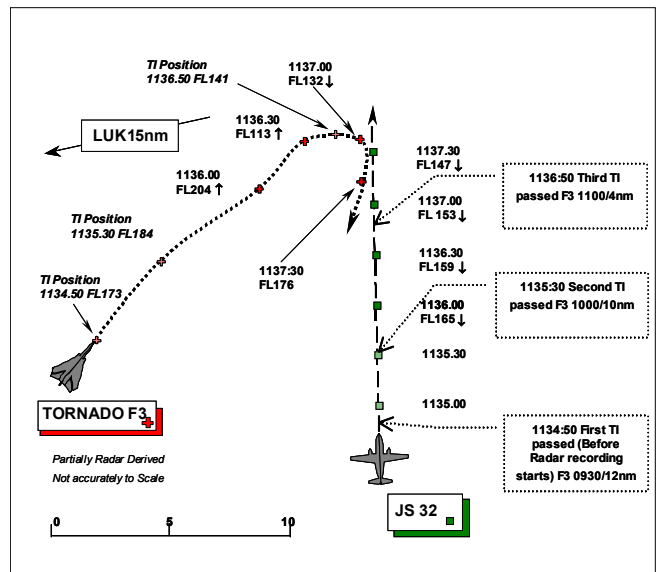
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A conflict in the FIR.

Degree of Risk: C.

AIRPROX REPORT NO 190/03

Date/Time: 27 Nov 1137
Position: 5637N 00155W (50nm S Aberdeen)
Airspace: Scottish FIR (Class: G)
Reporting Ac Reported Ac
Type: Jetstream 32 Tornado F3
Operator: CAT HQ STC
Alt/FL: FL150 15000ft (RPS 987 mb)
Weather VMC CAVOK VMC CAVOK
Visibility: >10k >10k
Reported Separation:
 0ft V 200ft H 0 V 1500ft H
Recorded Separation:
 0 V Under ½ nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE JETSTREAM 32 PILOT reports flying a scheduled passenger flight on a direct track from Leeds to Aberdeen with strobes and HISLs selected on and squawking as directed with mode C but with no CWS fitted. They were in receipt of a RIS from ScACC 50nm S of Aberdeen in Class G airspace, heading 355° at 240kt and FL150 when an ac came from underneath her port wing in a vertical climb. The ac later informed them that he did not know we were there. On landing the captain called RAF Leuchars ATC and requested that they debrief the pilot extensively.

THE TORNADO F3 PILOT reports flying a grey trainer ac with no AI radar or WS fitted on a local GH check sortie with another pilot in the rear seat and with HISLs selected on. They were in receipt of a RIS from Leuchars. As part of a visual unusual attitude recovery exercise they were they were pulling up into the vertical from 8000ft and a heading of 170° and speed of 350kt with the front seat pilot handling at the time of the incident. Shortly after they entered the vertical he saw a twin-engined turbo prop about 1500ft above them and immediately broke right to increase lateral separation but the CPA had passed before his flight path had changed significantly. The other ac appeared to be on a roughly reciprocal heading, offset to the E and in straight and level flight. He did not see the other aircraft take any avoiding action. The pilot in the rear seat saw the confliction at the same time as the captain and attempted to monitor the position of the civilian ac as they manoeuvred away. He then elected to clear the area to the SW and reported the incident by R/T to Leuchars whom he was working at the time.

THE ScACC SUPERVISOR provided a report as the controller involved was away for a prolonged period. He reported that the JS32 was receiving a RIS from Tay Sector and TI was passed to the pilot with respect to known military traffic. Standard separation was lost between the 2 ac and the JS pilot reported that she was filing an Airprox.

THE TORNADO STATION reported that the Tornado was operating under a RIS from Leuchars ATC and was engaged in high energy manoeuvring in a declared block from 5000-23000ft. The controller did not call the transiting traffic at FL150 as he had noted the Tornado operating at the base height of the block. This was a judgement call made with the intention of minimising unnecessary RT. Had the position of the conflicting traffic been called it is probable that this incident would have been avoided. As a result of this incident Leuchars ATC have been instructed to ensure that all traffic conflicting with

AIRPROX REPORT No 190/03

ac under a service from them is called with respect to the entire airspace block declared. Additionally aircrew have been reminded to request only that airspace required for the conduct of their exercise.

MIL ATC OPS reports that the F3 called Leuchars Radar (RAD) at 1131:02 and was placed under a RIS. Several transmissions ensued between RAD and the F3 pilot concerning various fast jet tracks operating in the area near that he notified for his general handling. At 1135:50 a change of voice is recorded on RAD, indicating a change of controller. At 1137:48 the F3 pilot asks whether RAD has *"...any traffic our level in our location"* to which RAD responds *"...Nothing showing the one in your location is indicating FL150"*. The F3 pilot responds at 1137:58 *"...Ah rog, well if he's seen us he'll probably be declaring an airprox"*. RAD and the F3 pilot then clarify details of the Airprox being at *"...min 37, FL150. Aircraft heading roughly north.....possibly a Dominie in our training livery"*.

Analysis of the Aberdeen Radar video recording shows the F3 general handling in the Bell Rock area at 11:35:33 indicating FL190 Mode C. The JS32 is 8nm SW of the F3 indicating FL170 tracking N. At 1135:44 the Mode C information of the F3 disappears for one sweep and reappears indicating FL195 whilst the JS32 continues on a northerly track indicating FL167 in a slow descent. Several seconds later the F3 is displaying Mode C FL204 at 1135:59 whilst the JS32, now 6 nm SW of the F3, is indicating FL165. The Mode C information on the F3 disappears again at 1136:08 and reappears at 1136:28 indicating FL113 whilst the JS32 is now indicating FL159. The Mode C information on the F3 disappears 10secs later for 2 sweeps and reappears at FL141 whilst the JS32 is indicating FL155, 3.8nm SW of the F3. At 1136:56 the separation between the JS32 and the F3 is 3.6nm and the Mode C indication on the F3 is FL138 and the JS32 is FL154. The Mode C information on the F3 disappears again at 1137:02 with the F3 tracking S and the JS32 still tracking N; the lateral separation between the 2 ac is 1.5nm. The F3 continues to track S until the blips merge at 1137:14 with the F3 indicating FL139 and the JS32 FL151. The F3 initiates a right hand turn onto W at 1137:28 the F3's Mode C indicates FL176.

The F3 departed Leuchars with the intention of general handling in the Bell Rock area in the block from 5000ft to FL230. RAD had placed the F3 under a RIS and advised him of various military ac that were operating or about to operate in the Bell Rock area. The JS32 had been maintaining a northerly track, which would route it through the Bell Rock area, whilst maintaining a continual descent into Aberdeen. Although the projected track of the JS32 would take it through the operating area of the F3 no attempt was made to pass traffic information on the JS32 to the F3 under the terms of RIS. The Unit Investigation stated that the Controller had not called the JS32 to the F3 because the latter had been operating at the base of its block for several minutes. However, there is no evidence, in the radar video recording, to substantiate this assertion. Although there are several instances (up to a maximum of 3 sweeps) when there is no Mode C information displayed on the F3, the indications before and after these breaks in Mode C indicate the F3 is always above FL100. However, under the rules of RIS *"...the pilot is wholly responsible for maintaining separation from other aircraft whether or not the controller has passed traffic information"*. At 1135:50 a change of voice was heard from RAD, which would indicate a change in controller. This would necessitate a handover of the control position at some stage between 1134:49 and 1135:50. Unfortunately, due to the lack of information available from the Controller's ATC Incident Report, the handover time cannot be determined. However, the JS32 was already within 10 nm of the F3 at the commencement of the video recording at 1135:35 indicating that TI should have been passed by the previous controller or the replacement controller (time dependant) and mentioned during the handover.

ATSI reports that a JS32 from Leeds to Aberdeen passing FL 155 in the descent to FL90, was in receipt of a RIS from ScACC, Tay Sector, with the planner and tactical positions bandboxed, when a fast moving military contact was observed manoeuvring in the horizontal and vertical plane to the W of the ac. The ac was identified as a F3 from with a Leuchars squawk. The Tay controller passed general TI to the JS32 pilot warning her of the presence of the F3 when it was at a range of about 25nm and this was updated when a conflict looked likely, stating: *"Callsign, previously mentioned traffic turning towards you again in your 11o'clock, range 4 miles, crossing ahead from left to right, indicating FL141, unverified"*.

Just prior to this it appeared that the F3 was climbing and turning away to the NW, more than 4000ft above the JS32 but shortly after the TI the F3 turned S directly towards the Jetstream in a steep climb. The conflict developed very rapidly with the events described here taking place over the period of 1½min. The unpredictability of the F3's intentions are illustrated by the following times and Mode C readouts taken from the radar recording of the Aberdeen (Perwinnes) radar recording:

11:35:34FL190 ↑

11:35:47FL195 ↑

11:35:54FL202 ↑

11:36:01FL204 ↑

11:36:25 FL103 (No mode C indications during the 24 second dive from FL204 to FL103)

11:36:35FL113 ↑

11:36:48FL141

11:36:55FL132 ↓

11:37:13FL139 ↑ (approx. closest point of conflict)

11:37:27FL176

11:37:37FL173

11:37:44FL156

11:37:50 FL151 ↓

The incident occurred in Class G airspace and the crews of the Airline concerned regularly fly the route between Newcastle and Aberdeen and are aware of the limitations of RIS and the very high likelihood of encountering military activity. On this occasion however, the crew were clearly shaken by the closeness of the encounter and by their assumption that the F3 pilot was completely unaware of the presence of their ac. The JS32 captain commented on the R/T that the F3 pilot “...*had no regard for anyone else in the sky*”.

The JS32 crew reported on the R/T that the F3 came from below their port wing in a vertical climb, about half a mile away. The report subsequently filed estimated the miss distance to be 200ft, same level and the targets merged on radar.

Given the F3's high energy, unpredictable flightpath, the Tay Sector Controller was not in a position to provide the JS32 crew with any meaningful avoiding action, nor was he obliged to do so under the terms of the RIS provided.

UKAB Note (1): The recording of the Aberdeen radar provided by Scottish Military was not of good enough quality to analyse the this Airprox in detail. The JS32 however, can be seen continuing on and undeviating N heading in a slow descent while the Tornado is manoeuvring between FL103 and FL204 initially in its 10/11 o'clock but moving slowly to the E. At the time of the Airprox the JS32 indicates F149 descending as the F3 climbs rapidly through its level from FL139 to FL176 in 2 radar sweeps (14sec) (the Mode C dropped out in the intervening sweep). Although the symbols of the ac overlap, they do

AIRPROX REPORT No 190/03

not merge indicating some horizontal displacement (the F3 to the W) probably just under ½nm however, due to the large scale of the recording, it cannot be measured accurately.

HQ STC comments that this is the second instance of Airprox between these 2 types in a 2-week period (see AP 198-03). We have already recommended that this piece of airspace should be designated an Area of Intense Aerial Activity (AIAA) and this adds further to the case. This would highlight the risk of transiting this area of busy Class 'G' airspace, in preference to the air-route structure available, to the JS32 crew. Of greatest concern was the inability of the Tornado F3 to manoeuvre whilst 'ballistic' having had little warning of the JS32's presence (due to RAF Leuchars' Radar trying to minimise R/T to the crew). All these factors made for a very nasty Airprox that frightened both the JS32 and the F3 crew. However, better communication of intent to all involved would have decreased the risk of occurrence significantly.

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 F3 was conducting a high workload sortie, which necessarily involved rapid changes of speed and flightpath. Recognising the limitation that this placed on their ability to conduct a good lookout, the captain requested a RIS from Leuchars to assist him fulfil this function. The Jetstream was predictable and clearly would transit through the F3's declared operating area and Members considered that the RIS provided was inadequate. They accepted that there had been a change of controller mid-sortie but either the F3 and its activities should have been discussed fully in the handover brief or the oncoming controller should have delayed his acceptance of the position for a few minutes until he was fully aware of the scenario. In this instance timely and accurate TI would most probably have reduced this Airprox to a non-event and the omission had clearly contributed to the late sighting of the conflicting traffic by the F3 crew. The TAY sector civil controller, on the other hand had fulfilled his responsibility well by providing the Jetstream captain with an abundance of accurate and timely information regarding the F3; due to geometrical circumstances and possibly the into-sun aspect however, it had not allowed her to acquire the F3, and therefore avoid it, until it passed very close in a near vertical climb. However, the Jetstream pilot was aware of the presence and approximate location of the F3 and some professional pilot Members were surprised that she did not react to the TI at an early stage thereby reducing the risk of collision.

Notwithstanding the circumstances above it was the responsibility of the respective crews to see other ac and avoid other ac; although the F3 crew did see the Jetstream it was very late and the proximity as they passed caused the Jetstream captain considerable concern. Members considered it unlikely that the F3 pilot's reaction had been in time to change the flightpath of his ac significantly before it passed abeam the Jetstream. The actual horizontal displacement between the 2 ac was hard to determine but Members noted that the Jetstream pilot first reported ½nm (3040ft) on her RT report; since this was her initial reaction they thought it more accurate than her subsequent written estimate of 200ft. Since the radar contacts did not fully merge (estimated at <½ nm) and considering the F3 pilot's assessment of 1500ft, Members thought this to be a best estimate. It was most likely therefore that the ac, although passing fairly close together, had flightpaths that were not in direct conflict; as this was only by chance, safety however, had not been assured.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A late sighting by the F3 crew compounded by the lack of TI from Leuchars RAD

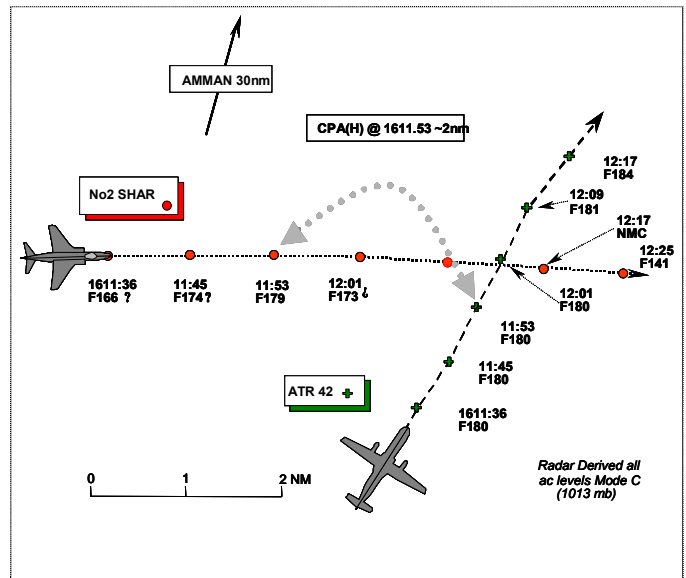
Degree of Risk: B.

AIRPROX REPORT NO 191/03

Date/Time: 26 Nov 1610
Position: 5120 N 00405 W (30nm south of AMMAN)
Airspace: London FIR (Class: G)
Reporting Ac Reported Ac
Type: ATR 42 300 Sea Harrier
Operator: CAT HQ STC
Alt/FL: FL180 FL178

Weather VMC Above CI VMC
Visibility: >10km >10km
Reported Separation:
V 200ft H ½ nm V 300ft H 4nm
(4000ft @ 2nm)

Recorded Separation:
V100ft H 2nm

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

THE ATR 42 300 PILOT reports flying a scheduled passenger sortie on a route through class G airspace from Plymouth to Dublin. While receiving a RAS from London Military Radar, heading 005° at 230kts and FL180 he received a TCAS TA followed by an RA as he was given avoiding action. He initiated a TCAS climb during the avoiding action turn and assessed the risk of collision as being high. The Lon Mil Controller apologised for the conflict stating that they were co-ordinated with the other traffic that had been told to remain below FL170. Lon Mil also stated that it was a student pilot.

THE SEA HARRIER (SHAR) PILOT reports flying as No2 of a pair of grey ac with HISLs, nav lights and beacons selected on and engaged in an Air Combat Sortie from Yeovilton. After an uneventful first engagement and while setting up for the 2nd, heading 090° at 420kt with his leader to the W, during the turn his controller transmitted 'Callsign 1 and 2 not above FL170 for co-ordination'. His leader responded with 'not above FL170 callsign 1 and 2'. At the time he believed the restriction to only applied to his leader and so he continued with post merge checks whilst climbing to FL260 in preparation for the next engagement. He became visual with the traffic whilst climbing and there was no risk of collision. Passing through FL170 at M0.7 his controller transmitted traffic on the nose at 5nm FL180 he immediately realised that FL170 was his restriction also and that the traffic he was visual with was also the deconfliction traffic. He immediately began a steep descent at FL178 to FL135 and observed the traffic to pass 5000ft above and well ahead.

THE RN FIGHTER CONTROLLER reports that she was controlling 2 Sea Harriers for a student pilot radar training sortie, under a RIS in the middle air. Due to poor weather to the S, the lead pilot requested they work over the Bristol Channel where the weather was better. The civilian a/c had climbed out of Plymouth tracking N and Plymouth Military requested co-ordination but the Sea Harrier pilots, who were under a RIS, were unhappy with the restriction that this would have placed on the block. (She had asked the leader if he was happy to be 'not below FL170'). She was then very busy planning and executing the next intercept when she observed the a/c change squawks to a 3325 squawk (London Mil). London Military Controller 32 then called and she repeated that the SHARs wished to operate the full block, adding that she thought they may clear to the North West. London Mil said they would avoid her ac. On completion of the intercept she attempted to split her a/c E/W with the Staff Pilot rather than the student heading toward the stranger but the ac had already split themselves with leader going to the W and the

AIRPROX REPORT No 191/03

student to the E. At this time they were around FL100 so she knew that a restriction on their block of FL170 when splitting outbound would have no tactical repercussions. She also realised that the No2 would, by heading E, close with the 3325 squawk, which had maintained a Northerly track. On this basis she considered it prudent to place a restriction of not above FL170 on both a/c, as they were splitting, to keep them safe and help the Controller at London Military. The formation leader acknowledged the call of not above FL170 for both ac. She then quickly called Controller 32 to agree co-ordination so that he wasn't concerned by the 'student' closing his a/c. The No2 needed to make ground to the E in order to enable the merge to take place in the best possible airspace weather wise. Just after she put the phone down from London Mil, she saw the No2's Mode C climbing but expected him to stop at FL170 as instructed. She called the ac in at 5-6 miles and reiterated *'make sure you are not above FL170'*. The Mode C continued to climb up to FL178. She then gave avoiding action by way of *'descend, descend, not above FL170'* and observed a rapid descent by the No2 whose contact merged with the civilian ac whilst in the descent. When merged she asked the No2 to check his height and he replied FL135. Controller 32 was called subsequently to apologise and explain the situation and she was called back and informed by him that the No2 SHAR had set off the ATR42's TCAS system and that the pilot would be filing. She informed the SHAR Squadron of the situation and continued with the sortie.

THE SEA HARRIER STATION comments that this Airprox was caused by the student pilot not complying with the level restriction imposed by the Fighter Controller (FC). The pilot wrongly thought that the level restriction imposed was solely for his leader. This was contrary to SOPs for Harriers operating under a FC. Following TI from the FC, the student pilot gained visual contact with the conflicting traffic at around 4nm, he thought, and therefore there was never any risk of collision. His subsequent rapid descent was made after he was given the avoiding action descent following advice that he should not be above FL170 (he was at FL178 at the time). The FC had previously been unable to co-ordinate her traffic due to the nature of the sortie however, when she identified the opportunity to do so without adversely affecting the sortie, she imposed a level restriction and initiated co-ordination with London Mil. After passing the restriction to her ac with the leader acknowledging the call, iaw SOPs, she was alarmed to see the No2 climbing towards the now co-ordinated traffic. She immediately reiterated the level restriction and followed with an 'avoiding action descent' as the pilot did not seem to respond instantly to the initial call. It is considered that the FC did all she could to resolve the situation given the unexpected 'level bust'. This Airprox has highlighted a potential deficiency in the SOPs concerning acknowledgement of requirements.

MIL ATC OPS reports that the timings of the RNAS Yeovilton transcript show a lag of approximately 1min and 50sec (at a point where mutual RT conversation has taken place) but worse they are not accurate. They jump back in time and cannot be considered reliable; therefore, all references referred to are approximate. Additionally, there are minor discrepancies relating to the actual wording between the reports.

The ATR42 departed Plymouth northbound and contacted LATCC (Mil) Controller 32 (CON 32) at 1606:50, *"...FL 170, 3325 the squawk"*. CON 32 identified the ac and instructed the pilot to *"...climb FL180, radar advisory, limited from all around due to a ... (unintelligible words)"* and repeated the climb instruction which the pilot read back. Simultaneously, a formation of 2 Sea Harriers (SHARs), was working RNAS Yeovilton D School, Controller 5 (CON 5) under an Air Defence Information Service (similar to RIS) in a block FL50-350. The lead SHAR pilot questioned *"is that the Plymouth traffic, bullseye, 095, at 17"* to which CON 5 replied *"affirm, I didn't co-ordinate him because you needed the block"*. A conversation followed between CON 5 and CON 32 in which CON 5 explained that the SHARs needed to operate the full block and were unwilling to compromise and CON 32 declared *"roger, we'll avoid you then"*. At 1609:15, CON 32 called traffic to the ATR42 crew *"...north west, 15 miles, manoeuvring, indicating FL 115, if not sighted, turn right 20°"*. Although they replied *"looking"*, the controller again instructed the pilot to turn and the pilot advised that he was complying with the instruction with an updated heading of 025°. Simultaneously, the SHAR formation declared that they had split and CON 5 confirmed that the leader was out to the W and the No 2 was out to the E. CON 5 then instructed both the SHAR 1 and 2 *"not above FL170 for transit of the Plymouth aircraft"*; the lead

pilot acknowledged *"not above FL170"*. At 1611:17, CON 32 answered a landline call from CON 5 to hear *"...(Console) 5 not above FL170, my 1705 and 1715"* to which CON 32 responded *"contact, London military maintain FL180"*. Similar wording is evident from the Yeovilton D School tape transcript. CON 5 then advised the easterly SHAR *"C/S 2, traffic on your nose, range 5, tracking north east, FL180. Make sure you are not above FL170...C/S 2, descend, descend, not above FL170...C/S 2 acknowledge"*. Concurrently, CON 32 updated traffic to the ATR42 *"north west, 5 miles, manoeuvring, co-ordinated below, not above FL170"* followed immediately by *"C/S, avoiding action, turn hard right heading 090, previously called traffic now, left, 10 o'clock, 2 miles, bust his level, indicating FL 175, climbing"*. The ATR42 pilot replied *"...I've got that traffic on TCAS"*.

Analysis of the Burrington Radar video recording at 1609:56 shows the ATR42 transiting 5nm N of Chivenor, tracking NNE at FL 180. At the same time the SHAR is 15nm NW of the ATR42, indicating FL109. The ATR42 maintained track and alt and the SHAR converged on a SE heading and climbed such that by 1611:38 the SHAR was indicating FL166, 5nm NW of the ATR42. The SHAR continued climbing and indicated FL174 at 1611:44, 3nm NW of the ATR42. Ten sec later as the ac closed, the SHAR indicated FL179, 2nm W of the ATR. At 1612:05 the SHAR showed FL173, less than 2nm W of the ATR42 and descended rapidly.

[UKAB Note (1): As the ac tracks crossed the mode C of the SHAR drops out, probably because of its high rate of descent; the vertical separation (after the SHAR commences the descent) therefore cannot be measured].

Prior to the Airprox, CON 32 (trainee) had requested co-ordination from Yeovilton D School CON 5, on the SHARs; this was not achieved and CON 32 stated that he would avoid the traffic. Complying with the rules of a RAS, CON 32 called the traffic to the ATR42 pilot along with advisory avoiding action to maintain standard separation. At 1611:15 CON 5 initiated co-ordination and it was agreed that the SHARs would not be above FL170 against CON 32's traffic maintaining FL180. As the tracks converged CON 32 recalled the traffic *"north west, 5 miles, manoeuvring, co-ordinated below, not above FL 170"*. At that time it (SHAR 2) was indicating FL166 but immediately after the message was passed the SHAR climbed through FL170, thereby breaking co-ordination. CON 32 mentor gave *"avoiding action turn hard right heading 090, previously called traffic now, left, 10 o'clock, 2 miles, bust his level, indicating FL 175, climbing"*. SHAR 2 climbed to FL179 and then rapidly descended on instruction from CON 5. At the closest point there was 2nm horizontal separation with 100ft vertical. The next Mode C indication on SHAR 2 was FL173 as it continued E and then the next indication 1612:40 showed FL144 as it diverged to the SE behind the ATR42. CON 32 did the best he could to fulfil the conditions of a RAS. The mentor intervened and provided avoiding action as soon as the SHAR's Mode C indicated above FL170. The D School controller also specifically asked both the lead and the No 2 SHAR to be not above FL170 as per SOPs, and again gave immediate instructions as soon as it was evident that the No 2 SHAR had broken co-ordination. The LATCC (Mil) reported that due to the Airprox not being declared on frequency, controllers concerned were not able to complete the relevant incident reports; it would be helpful if aircrew would indicate that they considered filing an Airprox on RT or immediately after landing so that accurate paperwork is completed. Although there are few ATC implications relating to this Airprox, the controllers have been reminded of the need to use standard landline phraseology and procedures.

HQ STC (In consultation with HQ FLEET) comments that the assumption made by the wingman was the key to this Airprox. The propensity for the human mind to interpret instructions differently has again been amply demonstrated.

The SHAR Stn highlighted a potential deficiency in the SOPs which we also believe to have contributed to this incident. With hindsight it would have been possible for the FC to ask both ac to acknowledge their height restrictions. Similarly, in common with RAF procedures for Air Defence sorties, the FC could have utilised a phrase, " Callsign 1 and 2...Your top level now FL170...Acknowledge".

AIRPROX REPORT No 191/03

Fortunately, both the FC and the ATCOs involved were sharp enough to spot the wingman's error and provide solutions before the ac got too close. In addition the wingman could see the ATR42 and therefore the risk of collision was nil.

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.

When considering the part played by the SHARs in this incident, specialist Members thought that the leader had a responsibility to check that all members of his formation understood and complied with safety instructions. The quick thinking and perseverance of the RN Fighter Controller and her attempts to gain co-ordination between the SHARs and the ATR42 impressed the Board. The Plymouth Military controller on the other hand had presented both London Military and Yeovilton with an unresolved potential conflict when it would have been fairly straightforward to route the ATR round the SHAR area of ops.

The actual cause of the Airprox, Members thought, was that the No2 SHAR pilot misunderstood the height limitation instruction passed by the Fighter Controller and climbed through his co-ordinated level into conflict with the ATR42. Both pilots had however, seen the respective opposing ac throughout and there had not been a risk of the ac colliding.

Members were concerned that the procedure adopted for the acknowledgement of safety critical information passed by controllers to formations of ac was not fail safe in that there was no means of checking that such instructions had been received and understood by all players. The Board therefore invited the MOD to review their procedures.

PART C: ASSESSMENT OF CAUSE AND RISK

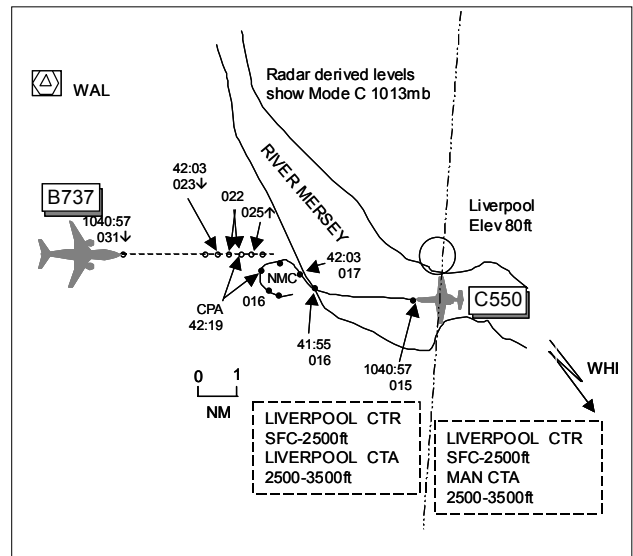
Cause: The No2 SHAR pilot climbed above his co-ordinated level into conflict with the ATR42.

Degree of Risk: C.

Recommendation: MOD reviews regulations with a view to ensuring that all parties concerned acknowledge safety instructions.

AIRPROX REPORT NO 192/03

Date/Time: 29 Nov 1042 (Saturday)
Position: 5319N 0258W (4nm W of Liverpool
 - elev 80ft)
Airspace: CTR (Class: D)
Reporting Ac Reported Ac
Type: B737 C550
Operator: CAT Civ Pte
Alt/FL: 1200ft↓ 1000ft
 (QNH) (QNH)
Weather IMC KLWD VMC CLBC
Visibility: 8km
Reported Separation:
 400ft V 0.5nm H not seen
Recorded Separation:
 0.6nm H

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

THE B737 PILOT reports on an ILS approach to Liverpool RW09 in landing configuration with the speed 'bug' set at 145kt (+20kt) owing to the wind (200/52KT). Liverpool ATC advised him that he was No2 to a Citation jet, which had joined the RH visual cct, and to continue approach. He was then told that the Citation would extend downwind to position behind his ac. The Citation did not appear on TCAS until just before a TA alert was received; the display indicated that the ac had cut across in front of him - it was never seen visually - causing an RA warning to be received and a go-around was commenced from 1200ft QNH, he thought. The warning disappeared almost immediately but the missed approach was carried out and this was followed by an uneventful approach and landing from a further ILS. He estimated that the Citation passed within 0.5nm of his track and 400ft below. It appears that the Citation pilot had not appreciated the strength of the southerly wind or made allowance for it downwind.

THE C550 CITATION PILOT reports flying inbound to Liverpool from Biggin Hill VFR and in receipt of an ATS from Liverpool TOWER. The visibility was 8km 600ft below overcast cloud in VMC when he positioned RH downwind at 1000ft at 130kt. The surface wind was in the region of 180/30KT but the 1000ft wind was far stronger than he had anticipated which led to his downwind RH track for RW09 converging towards the FAT. He thought that the 1000ft wind could possibly have been as much as 60kt. On the downwind leg, ATC offered him the option to position No1 to an inbound B737 but this gave him the impression that the B737 would be fairly close behind his ac, necessitating an immediate R turn onto base leg but his approach speed of 110kt was slow compared with that of the B737. He was not ready to turn in owing to the passengers not being seated in the cabin and he did not want to make a rushed cct owing to the strong wind. Immediately after ATC offered him No1 in traffic he declined saying "I would like to continue downwind for training purposes" to allow himself more time. At the time he was flying a heading 25° to the L of the downwind track to compensate for the strong southerly wind but this had resulted in the airport moving out of his field of vision as he was seated in the LH seat. Mindful that the noise abatement procedures required that his ac caused the least disturbance in areas surrounding the airport, his projected track would have taken his ac over a built-up area ahead. A R turn was started and he told ATC of his intention to orbit R, a L turn would have infringed the built-up area. Almost immediately he became aware that he was close to the FAT so he started to turn L, simultaneously with ATC instructing him to orbit L; he steepened the L turn but at no time did he visually acquire the B737. He believed that the B737 crew had received a TCAS RA leading to a go-around. In future he would ensure that the cabin was secure earlier to avoid distractions in the cct/approach phase of the flight and

AIRPROX REPORT No 192/03

endeavour to fly a cct direction to provide a better view of the RW in strong wind conditions i.e. LH in this case. He believed that there had been no risk on this occasion as the B737 had been TCAS equipped and its crew had responded correctly to the TCAS RA warning and that he was aware of his position relative to the FAT and was correcting his flight path.

THE LIVERPOOL ADC reports the C550 was downwind RH for RW09 and was told to keep its cct tight in order to be No1 in traffic; TI was given on the No2 ac, a B737 at 10nm final. The Citation pilot then requested to extend his cct downwind and position No2 which was approved. As the C550 approached 2nm SSW of the aerodrome, he decided to tell him to orbit L to avoid going too far downwind. Simultaneously, the Citation pilot requested a RH orbit which he refused saying "*negative, left hand*". The C550 pilot complied with the instruction but it appeared that the pilot had already started a R turn before reversing the turn direction to the L. This brought the Citation very close to the B737 who executed a TCAS go-around. The C550 pilot later apologised saying that he had underestimated the strength of the wind.

THE LIVERPOOL APR reports the B737 was being vectored for an ILS approach to RW09 when the C550 pilot called inbound from Biggin Hill. The flight details were copied and following confirmation that the Citation pilot had copied the weather information and his requested type of joining clearance, a VFR entry clearance was issued via WHI (Whitegate), VFR, not above 1500ft altitude. As the C550 passed WHI, he informed the ADC by intercom and, after the pilot reported the airfield in sight approaching the S bank of the Mersey, he transferred it to Tower. The B737 was by now approaching 10nm final so he informed the ADC and a short discussion took place concerning the landing sequence. The C550 was now 2nm S of Liverpool airport so it was agreed that it should be No1. The B737 pilot was cleared for the ILS approach and given TI on the C550 and was given No2 in traffic. Whilst he monitored the Tower frequency, he heard the Citation pilot state that he would rather go behind the B737 'for training purposes', which the ADC agreed. He told the B737 crew of the Citation pilot's intentions and transferred the B737 to Tower. One minute later he was told by the ADC, via intercom, that the B737 was making a TCAS go-around as his approach path had been infringed by the C550. The B737 crew then called on his frequency and stated that TCAS had indicated a horizontal separation of 0.5nm and 400ft vertically. After landing the B737 crew stated that they would be filing an Airprox.

UKAB Note (1): Met Office archive data shows the Liverpool METAR as EGGP 1020Z 15021G31KT 7000 –SHRA SCT013 BKN025 10/06 Q0993=

ATSI reports that the C550 pilot free-called Liverpool Approach at 1032, requesting a VFR join from the S. This was approved via Whitegate (WHI), not above 1500ft for RW09. The pilot confirmed passing WHI at 1037 and was cleared to route towards the airfield for a RH cct to report field in sight. The APR kept the ADC informed about its progress and at 1039, when the pilot reported that he had visual contact, the ac was transferred to the TWR frequency in accordance with local procedures for VFR arrivals.

Meanwhile, the B737 was being vectored for an ILS approach to RW09. Immediately after transferring the C550 to TWR, the APR informed the ADC that the B737 was at 11nm. Discussion took place between the two controllers as to the sequence order and it was agreed that the C550 would be number 1. The pilot was informed accordingly by the ADC, to keep it fairly tight because of the B737 about 9nm out. The C550 was just about to pass the airfield to the S, downwind RH. The pilot of the B737 reported established on the ILS and was instructed to continue and informed about a Citation just about to turn onto a fairly tight R base. Up to this point it is considered that the controllers' plan would have worked successfully. However, the pilot of the C550 requested to position number 2 'for training'. This was approved and he was told to continue downwind to report ready to turn base. The APR was advised of the changed circumstances and he, in turn, warned the B737 pilot that the Citation was continuing downwind to position number 2 and he may see the traffic passing on his R. The flight was then transferred to TWR.

At 1041, whilst downwind about 2.5nm WSW of the airfield the Citation pilot reported carrying out a RH orbit. At the time, the B737 was on a 5nm final, in the Citation's one o'clock range 3.5nm. The C550 was instructed to make it a LH orbit, with the other traffic on a 5nm final. Shortly afterwards, the B737 made its initial call on the frequency, reporting a 'TCAS go around'. The radar recording shows that the C550 did commence a R turn (1041:55) before reversing direction.

[UKAB Note (2): After the C550 is seen to reverse its R turn to the L at 1042:03 when indicating FL017 (1100ft QNH 993mb), NMC is displayed for the next 2 consecutive sweeps. The CPA occurs on the second of these sweeps, at 1042:19, the C550 in a L turn away from the FAT passing 0.6nm SE of the B737 which has stopped descent at FL022 (1600ft QNH). Eight seconds later the C550 shows FL016 (1000ft QNH) turning L through a SE heading as the B737 continues on the FAT but indicates FL025 (1900ft QNH) climbing.]

The Airprox occurred within Class D airspace. ATC complied with the minimum services to be provided to IFR/VFR traffic (MATS Part 1, Section 1, Chapter 2, Page1). If the Citation had continued downwind and not commenced an unexpected RH orbit, the subject ac would have passed close to each other but without risk of collision. However, a TCAS go around may still have occurred because of their relative close proximity. Arguably, in the circumstances, realising that the two ac would be passing close to each other, with the possibility of a TCAS alert, the C550 could have been given a LH orbit earlier or instructed to widen its cct.

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 the C550 pilot had positioned his ac pointing downwind in the visual cct but at a distance too close in to the RW without making sufficient allowance for the unusually strong southerly wind and subsequent turn onto final approach. After declining the offer of positioning No1 in traffic, the Citation pilot had then turned R towards the FAT without permission instead of continuing downwind and, in doing so, had flown into conflict with the B737 on final approach which he did not see. This had caused the Airprox.

The ADC had planned to give the C550 pilot a LH orbit to stop the ac going too far downwind. However this was only given after its pilot had requested a RH turn, which he refused, unaware that the C550 pilot had already started turning R. The Citation pilot had realised his proximity to the FAT and had reversed his turn, as ATC told him to turn L, but had not seen the B737 during his steepened turn below cloud. The B737 crew had been given TI on the Citation positioning No2 to his ac and had seen it on TCAS immediately prior to receiving a TA alert. An RA 'climb' warning ensued, with the TCAS display indicating that the conflicting traffic was turning into conflict, so the RA guidance was followed by executing a go-around. The C550 was never seen visually, owing to IMC, but was 'seen' on TCAS to pass 400ft vertically below within 0.5nm of his track. Some members believed that safety had not been assured during the encounter, as TCAS was the only 'safety net' which had worked with neither crew seeing one another. The majority did not share this view. Both crews were aware of each other's presence from the TI given by ATC whilst the B737 crew, with the benefit of TCAS, had stopped their descent 500ft above the Citation before climbing on the go-around. The recorded radar had shown the C550's turn taking it initially close to the FAT but at the CPA it was already well established on a diverging L turn away. The action taken subsequently by the B737 crew was enough to persuade the Board that any risk of collision had been effectively removed.

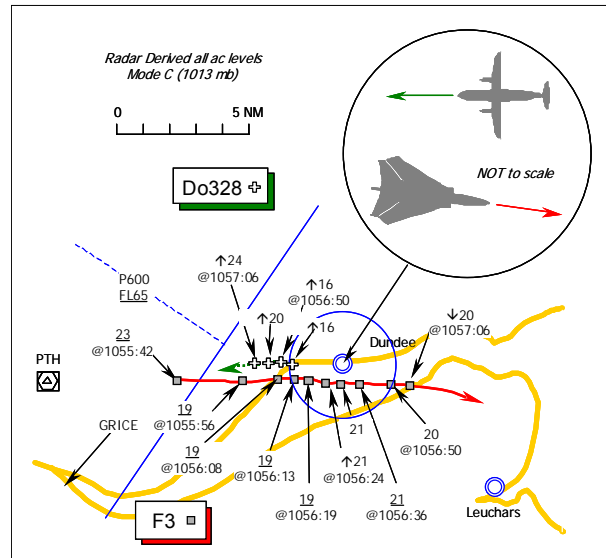
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Whilst flying a visual circuit, the C550 pilot flew into conflict with the B737 on the final approach, and which he did not see.

Degree of Risk: C.

AIRPROX REPORT NO 193/03

Date/Time: 28 Nov 1056
Position: 5626N 0302W (½nm SW of Dundee elev 17 ft)
Airspace: Dundee ATZ (Class: G)
Reporting Ac Reported Ac
Type: Dornier 328 Tornado F3
Operator: CAT HQ STC
Alt/FL: 1000ft↑ 2500ft
 (QNH 1004mb) (QFE 1002mb)
Weather VMC CLBC VMC CLOC
Visibility: 25km 20km
Reported Separation:
 1nm H/1000ft V 1nm H/2000ft V
Recorded Separation:
 NR

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

THE DORNIER (Do) 328 PILOT reports that his ac has a white and red livery. He was outbound from Dundee IFR to join CAS and in receipt of an ATS from Dundee TOWER on 122.9MHz. The assigned squawk of A5065 was selected with Mode C and TCAS is fitted, but neither a TA nor RA was enunciated during the encounter.

Whilst departing from Dundee RW28 heading 276° at 140kt climbing through 1000ft Dundee QNH (1004mb), some 1000ft below cloud with an in-flight visibility of 25km, they spotted a Tornado ac recovering to Leuchars from the W about 2nm away. No traffic information had been passed to him regarding this jet and he asked Dundee ATC about it, who said that they had just been passed traffic information as his ac was rotating at take-off. Although the Tornado was diverging from the Dornier's course, instead of a normal turn to GRICE on a heading of about 240° they maintained runway heading and reduced their rate of climb thus allowing for "a much greater margin" as the Tornado passed about 1nm away down the port side and 1000ft above his ac with a "low/medium" risk of a collision. He believed that the Tornado crew had only contacted Leuchars ATC when 5nm W of Dundee and added that although his prompt action "avoided a much more serious event", he had filed this report because "these incidents outside CAS do seem to have increased lately".

THE TORNADO F3 PILOT reports that he was inbound to Leuchars under a RIS from Leuchars ATC on 292.475MHz at 350kt, some 1000ft clear of cloud in VMC.

Heading 150° whilst flying at 2500ft Leuchars QFE (1002mb), he thought over the top of the Dundee ATZ, Leuchars ATC advised him of an ac taking off from Dundee. He spotted the Do328 taking off from the airport immediately about 1½nm away. There was no possibility of conflict and the Dornier passed 1nm away to port some 2000ft below his jet.

THE DUNDEE COMBINED TOWER & APPROACH CONTROLLER reports that the Do328's departure was coordinated with Leuchars RADAR and the airways joining clearance passed to Leuchars: "cleared to join on track GRICE climbing to maintain FL110". Leuchars requested that the Do328 maintain RW track after departure.

AIRPROX REPORT No 193/03

The Do328 taxied at 1053, was passed the airways joining clearance and departure instructions, then cleared for take off. As the ac started to roll Leuchars rang on the direct line asking for the position of the Do328 that was just rolling. Some 30sec later Leuchars rang again on the direct line as the ac was well down the runway approaching rotation, whereupon he was given traffic information on an eastbound Tornado 5nm W, descending to 2000ft he thought. As the Do328 was 'lifting off' he did not think that the Tornado was an immediate threat so he waited, intending to pass the traffic information when the aircraft was safely airborne. As the Do328 climbed through 200ft the pilot asked if he was aware of the Tornado, which he then saw pass the Do328 flying in the opposite direction at what was about 2000ft, he thought some 50ft to the S of RW28. As the ac had already passed each other it was too late to do anything.

UKAB Note (1): The Dundee 1050UTC METAR: SW:210/2kt Vis: 25km, Cloud: FEW 025 BKN060 QNH: 1004.

UKAB Note (2): The UK AIP at AD 2-EGPN-1-2, notifies the Dundee ATZ as a radius of 2nm centred on RW10/28 extending from the surface to 2000ft above the aerodrome elevation of 17ft amsl.

THE TORNADO F3 PILOT'S STATION comments (without the benefit of the recorded radar information) that the Tornado crew had full situational awareness with respect to the Do328 on take off. In our view there was no collision risk but recognise that it is often difficult to judge this, particularly against an unfamiliar ac. The perception of a greater collision risk may also have been exacerbated as the Do328 was on a reciprocal heading with a closure rate of almost 500kt. Thus the Do328 crew may not have seen the Tornado until late as the pilot [who reports sighting the jet at 2nm] would have been monitoring his own take off. Nonetheless, the Station has reiterated to Leuchars-based aircrew the need to avoid the Dundee ATZ by as wide a margin as is practicable.

ATSI reports that in accordance with local procedures at Dundee, ATC obtained a joining clearance from ScACC for the Do328. This clearance was to join CAS on track GRICE climbing to FL110. The Dundee MATS Part 2, Page 3-2, states that for IFR departures to the south, joining airways:

"Co-ordination with Leuchars will be effected in accordance with the letter of agreement and all conditions imposed by TAY including contact frequency, relayed to Leuchars APPROACH, who will allocate a local departure clearance if required".

The LOA states that, for outbound IFR flights:

"Dundee ATC will co-ordinate all outbound IFR flights with Leuchars ATC and pass the following information: a) Callsign. b) Aircraft type. c) Departure RW and initial route. d) Requested cruising level, joining point for controlled airspace and clearance details, as appropriate".

At 1053, Dundee ATC telephoned Leuchars ATC to inform them that the Do328 was taxiing for departure from RW28. Its departure clearance details, as required in the LOA, were passed. The Do328 was cleared for take off at 1055 and just afterwards, Leuchars RAD telephoned to enquire about the position of the Do328, whereupon RAD was informed that the ac was *"just about to roll"*. The Dundee Controller reported that, as the Do328 was approaching rotation, Leuchars telephoned to advise of a Tornado, position 5nm W of Dundee descending to 2000ft. (It has not been possible to access this telephone call because of a malfunction of the Dundee recorder but this problem is being addressed locally.) It was the judgement of the Dundee Controller that he would wait until the Do328 was airborne before passing traffic information, as he believed that the Tornado was not an immediate threat. However, the pilot reported sighting the Tornado before he did so, by which time the two ac had already passed each other. It is understandable why the Dundee Controller would have waited until the Do328 was safely airborne before passing traffic information. Without the benefit of radar he would not have known the exact position of the Tornado but could have expected that it would not pass through the Dundee ATZ without prior co-ordination. This should have allowed sufficient time once the Do328 was airborne, with pilot

workload decreasing, to pass the information. Additionally, by this time he would probably have sighted the Tornado and have been in a position to pass more accurate traffic information.

[UKAB Note (3): The Leuchars RT tape transcripts are about approximately 23sec in advance of the the radar recording timebase, therefore all timings within this report have been correlated to UTC by subtracting 23sec from the RT transcript timings.]

MIL ATC OPS reports with RT/landline transcript that the F3 crew free-called Leuchars DIRECTOR (DIR) at 1055:02 "*...15 miles to the west...looking for vectors to initials...*". The flight was allocated a squawk at 1055:19, and the heading - 090° - and altitude - 2500ft confirmed. At 1055:29, the F3 crew was instructed by DIR to "*...maintain 2500ft..Leuchars QFE 1002...*" and the airfield details passed – RW27RHC CC: BLUE fully serviceable. The F3 was identified at 1056:09, placed under a RIS and the crew reminded about their terrain clearance responsibility as the ac was flying below the Radar Vector Chart (RVC) minima.

[UKAB Note (4): As the Do328 had been offered to RADAR (RAD) for a radar service, at 1055:15 a liaison call had been made by RAD to Dundee asking where the Do328 was. Dundee advised it was "*...just about to roll*". The transcript includes part of an internal 'off RT/landline conversation' by DIR that at 1055:57, recorded "*...go straight over the top - can I go 2 point 5..*". This resulted in the DIR advising the F3 crew on RT at 1056:19, "*...keep a good lookout one possible departure from Dundee just getting airborne*", to which the F3 crew immediately reported at 1056:24, "*...visual with that traffic*". Once again, from the 'open microphone' recording DIR advised Leuchars RAD that the F3 crew was "*...visual with you*" at 1056:26. After some internal liaison calls the F3 crew was advised of their position relative to the aerodrome whereupon the F3 crew advised visual with Leuchars, the crew reverted to a visual recovery and at 1057:06, called TOWER. Meanwhile, at 1055:45, RAD requested that Dundee inform the Do328 crew that there was "*...traffic west of Dundee by 5 miles descending to 2000ft, fast moving*". Dundee acknowledged the call and at 1056:41 – about 20sec after the Airprox - the Do328 called RAD for a radar service.]

[UKAB Note (5): The Aberdeen Radar video recording does not illustrate this Airprox but shows the F3 some 6nm W of Dundee at 1055:42, squawking A0211 indicating 2300ft (1013mb). The jet's verified Mode C indicates the F3 was level at 1900ft (1013mb) from 1055:56, which equates to about 1630ft QNH (1004mb) [deduct 270ft to equate level to ALT] crossing the lateral boundary of the Dundee ATZ at 1056:13, maintaining an equivalent altitude of 1630ft (1004mb) before climbing at 1056:24, to 2100ft Mode C – about 1830ft QNH 1nm SW of the airport. The Tornado F3 passed about 0.69nm S abeam Dundee airport eastbound before crossing the boundary to the ESE indicating 2000ft (1013mb) - 1730ft QNH at 1056:50. The Do328 appears on radar just one sweep before, climbing through 1600ft (1013mb) - that equates to about 1330ft QNH (1004mb) - westbound some 2nm W of Dundee, by which time the Airprox had already occurred.]

RAD passed traffic information to Dundee about the F3 at the earliest opportunity and DIR also called the departing Do328 to the F3 crew who spotted it immediately. The Minimum Sector Altitude (MSA) in the area where the F3 crew called DIR was 3100 ft, placing the F3 below the RVC heights so DIR was unable to provide radar vectors. The F3 crew was instructed to fly at 2500ft, Leuchars QFE (1002mb), which when taking into account the pressure differential of the Dundee QNH of 1004 was theoretically above the Dundee ATZ. However, the Mode C readout on the F3 does not correlate with these instructions; the indicated 1900ft related to 1013mb places the F3 within the Dundee ATZ. When the F3 was identified it is assumed that the Mode C was verified by DIR, but the F3 was indicating 1900ft Mode C, which is outside the tolerances for Mode C verification. No attempt was made by DIR to clarify the F3's level or pressure setting. Furthermore, the F3 crew initiated a climb to 2100ft (1013mb) when near the Dundee overhead, but no transmission was made by either the F3 or RAD to that effect. Whilst the liaison call from RAD to Dundee was made by ZONE - a different controller than that controlling the F3 - at no stage was the F3 instructed to fly at 2000ft by DIR as is suggested within this liaison call. It would appear that the RAD

AIRPROX REPORT No 193/03

controller might have used the observed Mode C information indicated on the screen during the liaison call rather than accurate traffic information from DIR.

HQ STC comments that Leuchars and Dundee ATC communicated information about the F3, but unfortunately the information from the F3 came too late to avoid surprising the Dornier pilot. Had the traffic warning been relayed to the Dornier pilot earlier it is likely that he would not have perceived this incident as an Airprox. The early notification of intentions, by all players to all players, is one of the best means of avoiding air incidents.

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.

In the Board's view, the F3 crew had left it fairly late to call DIR at 15nm range from Leuchars - the RAF FLIP BINA entreats pilots to call DIR at 40nm. Consequently, the controller had little time to pass any traffic information to Dundee through the ZONE controller, who was expecting the Do328 ultimately to call for a radar service in accordance with the established agreements between these adjacent aerodromes. Nevertheless, ZONE and DIR had evidently succeeded in the short time available to pass on this information and had done their best to ensure that Dundee ATC was aware of the jet's presence and that the F3 crew was forewarned about the Do328 as soon as practically possible. Once the Dundee controller had received traffic information on the F3, he had acted with the best of intentions and decided to inform the Do328 crew after take-off - a decision that was made for entirely understandable reasons in the circumstances - but it was apparent that the alert Do328 pilot had spotted the F3 before the Dundee controller had time to pass on this important traffic information. Whilst not wishing to overload crews at critical phases of their flight, members thought that the crew should have been entirely capable of handling this information at that stage. From the Do328 cockpit, the crew would have been understandably concerned at the presence of a fast jet looming large unannounced. However, once spotted they wisely delayed their turn on track for the CAS joining point, thus ensuring appropriate horizontal separation was maintained against the F3.

It was evident that the F3 crew had not flown at the stipulated height of 2500ft QFE (1002mb) whilst inbound to base - some 2538ft amsl (Leuchars elevation: 38ft), which should have taken them well clear above the Dundee ATZ top altitude of 2017ft amsl. The radar recording had shown the Tornado was significantly lower - at an equivalent altitude of about 1630ft through the Dundee ATZ - slightly more than 1600ft above the Dundee elevation of 17ft. This was clearly the crux of the Do328 pilot's concern and members questioned why DIR had not recognised this. The Mil ATC Ops advisor said that there was no clear explanation for this oversight; the F3 had been allocated an appropriate squawk and the associated Mode C should have been verified by the controller to be within the applicable tolerances (+/- 200ft on observed Mode C indications). There was no transmission on RT to indicate it had been verified within limits, but also nothing to suggest either that it was grossly in error. With this in mind, members could only speculate that the F3 crew might have unwittingly set their altimeter incorrectly. Weighing all these factors carefully, the Board concluded that this Airprox had resulted because the Tornado F3 crew entered the Dundee ATZ without permission. Nevertheless, both pilots had seen each other's ac in good time as the F3 passed 0.69nm S of Dundee. Furthermore, the F3 pilot was always in a position to afford a greater separation if need be in his nimble jet. Whilst the separation that existed was probably somewhat less than that reported by both pilots, the Board agreed unanimously that no risk of a collision had existed in these circumstances.

PART C: ASSESSMENT OF CAUSE AND RISK

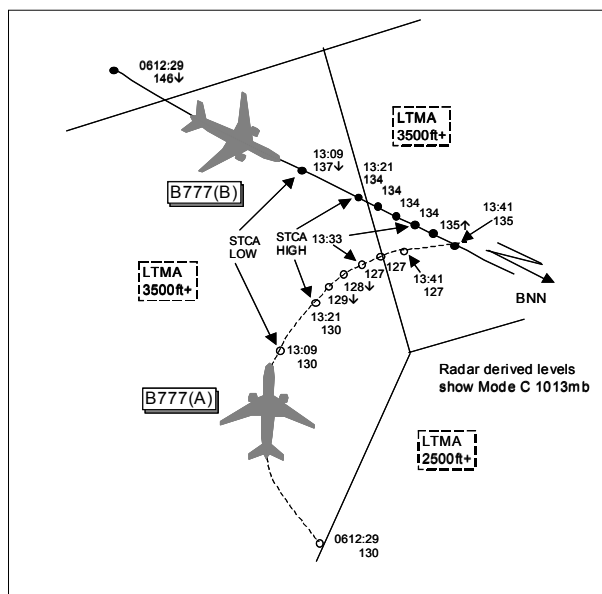
Cause: The Tornado F3 crew entered the Dundee ATZ without permission.

Degree of Risk: C.

AIRPROX REPORT No 194/03

AIRPROX REPORT NO 194/03

Date/Time: 1 Dec 0613 NIGHT
Position: 5146N 0042W (6nm WNW BNN)
Airspace: LTMA (Class: A)
Reporting Ac Reported Ac
Type: B777-200(A) B777-200(B)
Operator: CAT CAT
Alt/FL: FL130 FL135↓
Weather NK VMC CLBL
Visibility: NK 10km
Reported Separation:
700ft V 500ft V 0.5nm H
Recorded Separation:
400ft V 1.6nm H or
800ft V 0.6nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE B777(A) PILOT reports turning R onto the inbound leg of the BNN hold level at FL130 at 210kt. He noticed on TCAS another ac descending and flying towards him from L to R, it appeared that ATC had cleared this ac into the BNN hold at the same level. TCAS commanded an RA 'descend', which was followed, but this immediately conflicted with another ac in the hold below, generating another RA. ATC gave an avoiding action turn, the long way around, back towards BNN, a significant turn, whilst TCAS manoeuvring required that he flew 'wings level'. TCAS then gave a 'monitor vertical speed', the display was indicating that the 1st ac passed 700ft above and the second one 800ft below.

THE B777(B) PILOT reports heading 120° at 220kt inbound to Heathrow and entering the hold at BNN having been cleared to descend to FL130. TCAS gave a TA alert followed by an RA (when descending through FL135) to reduce descent rate and then to climb. At the time he was flying 500ft below cloud in between layers and he saw the other ac at FL130 approximately 0.5nm on his RH side, below. He commenced climb and notified ATC of his TCAS manoeuvring, who cleared him to climb to FL150.

ATSI reports that the Airprox occurred approximately 40min before the end of the controller's second night shift. He said that, when he took over the TMA N Sectors, about 10min previously, they were bandboxed onto the TC NE Departures frequency. This, he commented, was normal operating practice for that time of day but, he added, a controller was available to open the Co-ordinator position if required. He described the workload as low.

Owing to Heathrow night time noise regulations restricting movements prior to 0600, holding at BNN and Lambourne (LAM) was taking place when the controller took over the TC N Sectors. He commented that, due to the arrival order at the relative stacks, the traffic holding at LAM was to be sequenced ahead of that holding at BNN. Consequently, when the B777(A) pilot established communication with TC N, at 0603, he reported levelling at FL150 and was instructed to hold at BNN. Subsequently, the B777(A) was given stepped descent to FL130, as levels became available at BNN.

The B777(B) pilot made his initial call on the TC N frequency, at 0610, reporting passing FL155 for FL150. Shortly afterwards, the flight was cleared to descend to FL140, as the B777(A) vacated that level, and was instructed to hold at BNN, to expect a 15 to 20min delay. At 0612:27, the TC N SC

instructed the B777(B) pilot to descend to FL130 i.e. the same level as the B777(A). The radar shows that, at the time, B777(A) was holding at BNN, passing FL132, whilst B777(B) was still approaching BNN, passing FL146, 7.4nm to the NNW of B777(A). The SC said that the only explanation he could offer, in descending B777(B) to an occupied level, was that he must have observed what he thought was a Mode C readout from B777(A) which indicated that it had vacated FL130 and assumed he had cleared it to a lower level. He commented that, owing to the number of ac holding at BNN, the labels of the various ac were overlapping, making it difficult to decipher them individually and this is born out by the radar recordings of the event. He reasoned that he must have picked out a Mode C readout at FL120 and associated it erroneously with B777(A). He admitted that he had not checked the fpss, which were correctly annotated and would have shown the confliction.

The SC said that he first became aware of the confliction between the subject ac at 0613:09, when the pilot of B777(A) reported a TCAS descent. At the same time STCA activated with a low severity alert. The two ac were now 2.2nm apart, separated vertically by 600ft. It is understood that a warning was shouted across from the Heathrow Intermediate Director (INT DIR), who had noticed the situation, although the SC said that he was not aware of this alert at the time. B777(A) was given an 'avoiding action' heading of 090°. The SC said that his intention was to route the ac away from the holding area but added that, with hindsight, a more northerly heading would have been appropriate. He instructed B777(B) to climb to FL140, whereupon the pilot reported climbing in reaction to a TCAS RA; TI was passed to the flight, followed by further climb to FL150. B777(A) was then instructed to fly heading 070°. B777(B) arrested its descent at FL134, at 0613:21, when STCA changed to a high severity alert. At the time B777(A) was maintaining FL130, 1.6nm away. Vertical separation was restored approximately thirty seconds later.

[UKAB Note (1): Over the next 20sec the horizontal separation continued to reduce whilst the vertical separation increased as both ac responded to their respective RAs. The next sweep after STCA activated, at 0613:25, shows B777(A) descending through FL129, 500ft below B777(B) maintaining FL134 1.3nm to its NE. Four seconds later, the lateral separation had reduced to 1nm but the subject ac were then 600ft vertically apart as B777(A) descended through FL128. By 0613:33 the distances between both B777s were 700ft and 0.7nm and at the CPA, 8 sec later, B777(B) passed 0.6nm E of B777(A) and 800ft above.]

The SC said that, in a holding situation, it is difficult to observe the various SSR labels because of data block overlapping. On this occasion, the situation was exacerbated because the TC N Sectors were bandboxed, necessitating the radar display being selected to cover a greater range i.e. 60-65nm instead of the usual 40-45nm. As a consequence, the acs' labels appeared closer together. In order to overcome this problem of label overlap, a system, known as 'Stack Windows', is available to TC Controllers. The Stack Windows system was introduced following a 'level bust' incident at LAM, when severe label overlap delayed the identification of the ac concerned. This facility allows the selection of areas of the main NODE-L radar display within a separate Stack Window (the range within the main radar display remains unchanged) to reduce periods of label overlap between ac holding over the same holding point. For the TC N position, the window is individually selectable and can be moved around the radar screen by dragging and dropping but it is, additionally, resizable to fit the desired location or sector requirements. However, in the opinion of the SC, and that of his colleague, the Stack Window system is not 'user friendly' and does not always resolve the situation if the ac are in very close proximity, as on this occasion. Consequently, in their experience, it is not often utilised on the TMA Sectors and the SC confirmed that it was not selected during this incident.

During the course of the investigation an anomaly was found within the LTCC MATS Part 2, concerning inbound releases to Heathrow INT. Page HRW-19 states that: "TC BNN and TC LAM are not to release traffic to TC Heathrow INT North above FL110. TC Heathrow must not vector traffic from the LAM or BNN holds above FL110." However, Page HRW-24, also reiterated on Page NWE-15, states that: "TC BNN may release traffic to TC Heathrow above FL110 subject to the following condition: TC Heathrow will ensure all traffic, vectored from the BNN hold towards intermediate approach, is FL110 or below by

AIRPROX REPORT No 194/03

5nm DME beyond BNN to ensure separation from TC Capital airspace.” Whilst not being a factor in this incident, it was noted that inbound ac at BNN were being released to Heathrow at FL120 and according to the controller involved this is a usual occurrence, especially when the lowest level available to TC is FL90 or higher. It is, therefore, recommended that these contradictory statements, in the LTCC MATS Part 2, be addressed locally.

As a direct result of B777(A) descending from FL130, in reaction to a TCAS RA, separation was lost from the ac holding directly below at FL120. This, in turn, led to a further loss of separation from the ac holding at FL110. Action was taken by the Heathrow INT N DIR to resolve these conflicts.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members could add nothing to the ATSI report and agreed that the Airprox had been caused by the TC N SC descending B777(B) to the level occupied by B777(A). Although the TC N SC may have misread the SSR information of B777(A), owing to overlapping labels from other ac holding at BNN, the fpps would have shown the confliction.

The B777(A) crew had noticed B777(B) in potential confliction on TCAS and had complied with the ensuing RA ‘descend’ warning without visually acquiring the other ac. Meanwhile, B777(B) crew, whilst descending to FL130, had received a TCAS TA alert then an RA ‘climb’ and followed the guidance, seeing B777(A) 0.5nm to their R below. The TC N SC had been alerted by STCA to the incident. ATCO members thought that the SC had issued a heading to the B777(A) crew to resolve the confliction in order to try and stop any ‘domino’ effect which was likely to follow if ac already established in a holding pattern were to then receive TCAS warnings triggered by traffic descending from above complying with RAs. Some members believed that as both TCAS and STCA ‘safety nets’ had worked, the situation had been resolved with no risk of collision. The majority did not share this view. The avoiding action heading given by the controller did little to ‘take the heat out’ of the situation leaving resolution to TCAS in the vertical plane. The B777(B) crew had stopped their descent and levelled off at FL134 before commencing a climb whilst the B777(A) crew had commenced a TCAS descent when separation had reduced to 1.6nm but at the same time turning onto the ATC issued heading of 090°, which took them towards B777(B). These elements combined with the ensuing TCAS RA ‘domino’ effect with other ac in the holding stack below, persuaded the Board that the normal traffic flow had been compromised to the extent that safety had not been assured during the dynamics of the encounter.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The TC N SC descended B777(B) to the level occupied by B777(A).

Degree of Risk: B.

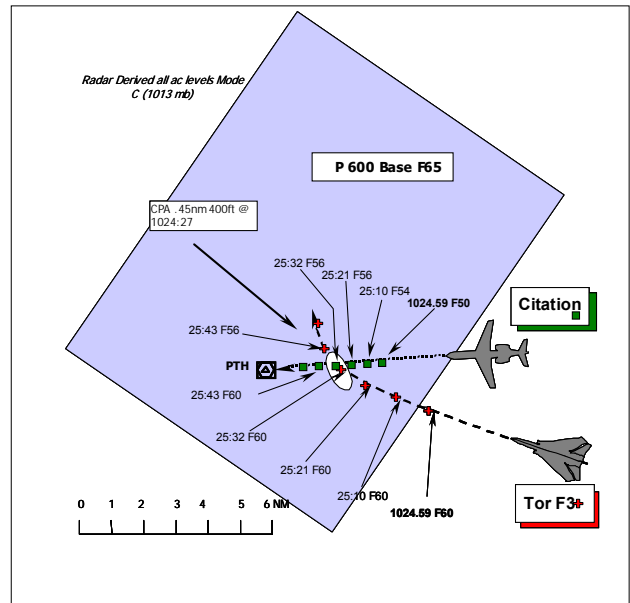
AIRPROX REPORT NO 195/03

Date/Time: 4 Dec 1025
Position: 5628N 00317W (4nm East of Perth)
Airspace: Scottish FIR (Class:G)
Reporter: ScACC

<u>First Ac</u>	<u>Second Ac</u>
<u>Type:</u> Citation C550	Tornado F3
<u>Operator:</u> Civ Com	HQ STC
<u>Alt/FL:</u> FL56	FL60
<u>Weather:</u> VMC	VMC
<u>Visibility:</u> NR	>30km

Reported Separation:
 0.25nm H 'Low'
 0.5nm H 2000ft V

Recorded Separation:
 45 nm 400ft V

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

THE ScACC CONTROLLER reports that he was acting as Tay Sector Controller and traffic was light with only 3-5 ac on frequency. Dundee requested an airways joining clearance on a Citation and he passed clearance to join on track PTH climbing to FL150, when instructed by Radar FL350. Shortly afterwards Leuchars called requesting the Leuchars corridors N and S, up to FL120. He informed Leuchars that he could not grant this as he had a Dundee departure. The call was protracted, as the Leuchars Controller had to answer several RT calls and a couple of his own ac called. Leuchars again requested the corridor and at that point the Citation got airborne from Dundee. He told Leuchars this and passed the Citation squawk; Leuchars said their traffic was 'well above him' and again requested the corridor. He did not feel that he could procedurally give the corridor away as he still did not have radar contact on the Citation. During the call, the Citation painted on radar and was clearly in conflict with the Leuchars F3. The Citation then called, but the Leuchars Controller had hung up, and although he had not positively identified the Citation, nor given him a particular service, he felt it necessary to pass avoiding action (stop climb immediately as he passed FL53 climbing) and TI. The F3 was at FL60 and passed overhead above the Citation, but the Citation had stopped his climb at FL55/56. The Airprox occurred beneath the Airway in class G airspace.

THE C550 PILOT provided a report 5 months after the event when prompted for the 3rd time. He reports flying a white and green ac with all his lights switched on, but no TCAS fitted, on an air taxi flight from Dundee to London City airport. On departure from Dundee he called ScACC, heading 250° at 220kt and was procedurally cleared for climb by radar, with the caveat "Stay clear of controlled airspace". This clearance and comment conflict with each other, as only with proper pre-flight briefing and detailed knowledge of the local area, can any crew comply with it. The comment to stay clear of controlled airspace came along with the departure clearance shortly before take off. When flying IFR most of the time, they do not carry VFR charts on board, that would help to identify any restricted airspace and it is not mandatory. He was also unsure as to why he was given avoiding action when they were not in radar coverage and why they were cleared with a 'direct to' and to climb to an altitude into controlled airspace. He is aware of a similar situation when departing from Oxford Kidlington on a similar procedure. On asking for clarification on this conflict in clearance, he was given an altered departure clearance, keeping him out of controlled airspace. He opined that the giving of imprecise clearances was a weak point in many areas of the UK and that nowhere else in Europe are such clearances issued. In his

AIRPROX REPORT No 195/03

capacity of Ops Manager of the Airline he has advised all their crews to insist on a proper clearance that will prevent such conflicts otherwise such departures must be considered VFR.

[UKAB Note (1): Although a formal transcript was not available, ATSI listened to the tape of the Dundee RT frequency. The clearance passed to the Citation pilot was *'Join CAS on track to PTH climbing to FL150. Climb when instructed by Radar to FL350'*. This was read back correctly, was not questioned, and there was no further exchange with the crew. At no time did Dundee pass an instruction to remain outside CAS. The Transcript of the ScACC RT frequency shows that they too passed no such instruction. The Citation pilot was however told by ScACC to *'Stop climb immediately'* as an avoiding action following his first calling on frequency passing 5000ft which he acknowledged *'stop climb immediately were calling five five'*].

THE TORNADO F3 PILOT reports flying an F3 on a QFI check sortie. He was heading 300° at 350kt on a SID4 under a RIS but capped to FL60 by Leuchars ATC. They were given TI on an ac right at 2 o'clock at 4nm indicating 4000ft crossing right to left. On looking in that direction the ac was acquired visually at 2nm, right 1 o'clock, and 2000ft below. The ac passed underneath and slightly in front of their nose. They had already called visual to Leuchars ATC.

THE TORNADO F3 Station comments that in this incident the Tornado crew had full situation awareness with respect to the conflicting traffic. Safe separation was maintained throughout and no collision risk had existed.

MIL ATC OPS reports that at 1021:22 Dundee ATC called the Leuchars Radar Controller (RAD) *"hi radar, it's Dundee, we've got a Citation going off towards Perth, do you want to work him?"* to which RAD replied *"eh...(unintelligible) negative"*. RAD spent the next minute talking to 2 other ac and then called the civil Tay Sector Controller (TAY) to *"...request the corridor up to 120 north and south from now until minute 30" (for use by the F3)*. TAY replied *"we've got an aircraft due off Dundee climbing to FL 150...(inaudible) and he'll be through in about 10 mins"*. At that point, the F3 called airborne and requested a RIS to which RAD responded *"C/S identified, stop climb FL 60, radar information"*. Another ac pilot interrupted the flow of communication before it was established that the ac departing Dundee towards Perth would be on a 4360 squawk. At 1023:30, RAD advised TAY that *"he (the F3) will be well ahead of him, he's well above him now...can I have the corridor up to 120?"* Again RAD was interrupted by another ac but then immediately returned to the negotiation with TAY *"sorry, can I have the corridor up to FL 130 from now until minute 30, mine's well above yours...0201 (squawk)"*. TAY questioned what the callsign would be and again RAD was interrupted by another ac but told the pilot to standby. Whilst the landline to TAY was still open, at 1024:28 RAD passed TI to the F3 *"C/S, traffic 12 o'clock, 3 miles, crossing right to left, indicating 4000 ft"*. The F3 pilot replied *"...looking, we're FL 60"* which promoted the response from RAD at 1024:51 *"C/S turn right heading 360"*. When the F3 then announced *"visual with that traffic"* RAD instructed the F3 crew to resume their own navigation at 1024:58.

[UKAB Note (2): The N and S corridors are portions of airspace within P600 which are promulgated and defined on the UK(L) En-Route Charts, which Leuchars controllers can book to operate in CAS between FL 65 and FL 120].

Analysis of the Lowther Radar video recording shows the Citation transiting out of Dundee on a 4360 squawk (code callsign converted) tracking W. At 1023:09 it is 4nm W of Dundee (7nm E of Perth VOR) just about to enter underneath P600 indicating 030 Mode C associated with a climbing arrow. At the same time the F3 is shown on a 0201 squawk, transiting W of Leuchars on a WNW heading, 5nm SE of the C550, indicating 049 Mode C, also displaying a climbing arrow. The Citation maintains heading and at 1024:00 it is 3.5nm E of Perth indicating 050 Mode C climbing and the F3 is now indicating 060 Mode C converging on a NW heading, 2nm SE of the Citation. At 1024:27 the blips merge 2.29nm E of Perth VOR with the F3 indicating 400 ft above the Citation (the latter showing 056 Mode C). Thereafter the 2 tracks diverge as the Citation tracks W towards Perth and the F3 transits to the NW.

The C550 was flight planned to depart Dundee and join CAS at Perth. The Mil Unit advised that a “gentleman’s agreement” exists between ATC RAF Leuchars and ATC Dundee that traffic departing Dundee joining airways at Perth is generally worked by Leuchars ATC, (subject to controller workload). The ac often request a RAS but sometimes a RIS for the short transit and the ac is pre-noted. From the Letter of Agreement (LoA), Dundee ATC responsibilities are stated:

“Outbound IFR Flights. Dundee ATC will co-ordinate all outbound IFR flights with Leuchars ATC and pass the following information:

Callsign.

Ac type.

Departure RW and initial route.

Requested cruising level, joining point for CAS and clearance details, as appropriate.”

Dundee also have multiple VFR departures which transit towards Perth which sometimes request to be under a service from Leuchars since Dundee does not possess radar. In this instance, Dundee ATC called RAD and stated “*we’ve got a Citation going off towards Perth, do you want to work him?*” Since the Dundee controller did not pass the complete information laid down in the LoA, RAD interpreted this offer to be a transit and declined to work the Citation having no traffic to affect; he was working 3 other ac and reported his workload as high. RAD had also been waiting 40min for the F3 to depart on a SID4. Shortly after the conversation, the F3 departed under a RIS, hence RAD immediately called TAY to negotiate the corridor. The conversation with TAY was interspersed with interruptions from various ac on both sides but once TAY had informed RAD that the ac departing Dundee was climbing to FL150 and would be through in 10min, RAD restricted the F3 to FL60 (to remain underneath P600 CAS). RAD attempted to identify the TAY traffic and at the time diagnosed that the F3 was well above and ahead of the Citation. The latter however, was not yet under control of TAY and both controllers then became absorbed in conversations with other ac crews. RAD realised that he was not going to secure the corridor and provided the F3 with TI on the climbing Citation indicating 2000 ft below. RAD observed the 2 contacts converge both laterally and vertically and as he was unable to climb the F3, he instructed the F3 to turn right onto N to create some lateral separation between the 2 ac. The report of the TAY Controller stated that although the Citation was not yet under a service or had been identified, he felt obliged to stop its climb as it passed through FL 053. From the radar videotape, the closest point of approach between the 2 ac is less than 0.5nm with 400 ft vertical separation, although the F3 reported visual with the C550 when it was 2000 ft below. Once the F3 called visual with the Citation, RAD advised the pilot to resume his own navigation. RAD not only fulfilled his responsibilities under the rules of RIS, but additionally under the duty of care attempted to ameliorate the situation as he observed the 2 contacts converge, by turning the F3. The Citation was not actually under an ATS from anyone in Class G airspace and therefore RAD was never asked for co-ordination on the F3. Ironically, if RAD had taken the traffic from Dundee, he would have been able to deconflict both tracks and present TAY with a fait accompli for the airways joiner and the transit traffic through the corridors.

[UKAB Note (3): The SID4 profile utilises both the N and S corridor within P600 hence both are requested for a transit].

ATSI reports that analysis of the reports and RTF recordings reveals no civil ATC error. The procedures detailed in the MOU between ScACC and HQ STC/RAF Leuchars, in respect of activating the Airway P600 Leuchars Radar Corridor, were not followed. The telephone coordination initiated by the Leuchars controller was ambiguous and unclear (RAD asked for F120 and F130).

The civil controller is commended for recognising the situation early and taking prompt action, as soon as the C550 reported on frequency. Even so, the vertical distance between the ac still reduced to 400ft.

AIRPROX REPORT No 195/03

HQ STC comments that communication let all parties down in this Airprox. Had the intent of both ac been known to all involved then, in all probability it would not had occurred. The relatively short track, and that the 2 ac were aiming for the same piece of sky from differing start points, compounded the problem.

Fortunately, a combination of avoiding action and the fact that the F3 saw the Citation meant that risk of a collision was never a factor and the F3 crew safely routed behind the business jet at ½nm and 400ft. It is hoped that this Airprox could be used for future controller training to illustrate the complexities of this portion of Scottish airspace.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board considered that the use of incorrect phraseology by the Dundee controller meant that the precise meaning of his message was not fully understood by the Leuchars RAD Controller. Similarly, poor communication on the latter's behalf contributed to the ScACC TAY Sector Controller not being able to grant Leuchars the N&S Corridors. Had both Dundee and Leuchars been clearer and less anomalous in their respective messages it is possible that Leuchars RAD would have agreed to work the Citation en route to joining CAS at Perth, and consequently co-ordinate it with his own F3; the TAY Sector Controller would also then have been in a position to give Leuchars the corridors. This more professional sequence would most probably have meant that the Airprox would have been prevented.

Although it did not contribute directly to the incident, it was of some concern to the Board that the Citation pilot (and Flight Ops Manager of the company) did not understand the procedures after take-off from small airports for transiting through Class G airspace en-route to join Class A/D CAS in the UK. That his recollection of events was flawed regarding his departure clearance and entry into CA further reinforced this apparent bewilderment. Members expressed further concern that the Citation Operator does not routinely carry all the charts pertinent to the airspace in which they operate. Lack of understanding by both civil and military pilots of the implications of IFR departures through Class G airspace and expectations regarding the level of ATC service is not an uncommon occurrence.

In this case however, timely and effective actions by the ScACC TAY sector Controller and the F3 pilot (following TI from Leuchars RAD), ensured safe separation between the 2ac had been assured.

PART C: ASSESSMENT OF CAUSE AND RISK

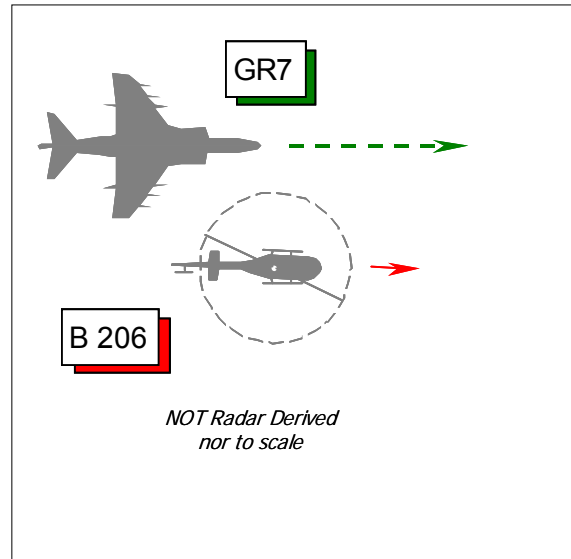
Cause: A conflict in the FIR resolved by the TAY Sector Controller and the F3 pilot.

Degree of Risk: C.

Contributory Factors: Poor communication between the Dundee and Leuchars Controllers.

AIRPROX REPORT NO 196/03

Date/Time: 4 Dec 1418
Position: 5200N 0212W (Vicinity of
 Tewkesbury elev: < 200ft)
Airspace: UKDLFS/FIR (Class: G)
Reporting Ac Reported Ac
Type: Harrier GR7 Bell 206
Operator: HQ STC Civ Trng
Alt/FL: 450ft 1000ft↓
 (Rad Alt) (RPS)
Weather VMC VMC
Visibility: 15km 10nm
Reported Separation:
 30m H/300ft V 400ft V
Recorded Separation:
 NR

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

THE HARRIER GR7 PILOT reports his ac has a grey camouflage scheme, but the HISL was on whilst flying a routine low-level training sortie through LFA4. A squawk of A7001 was selected with Mode C; but neither TCAS nor any other form of CWS is fitted.

Flying at 450ft (Rad Alt), heading 080° in the vicinity of Tewkesbury at 430kt, he spotted a helicopter slightly right of the nose at a very short range of about ¼nm and 300ft slightly above his jet. No avoiding action was taken as the helicopter was seen very late with only about 2sec from first sighting to it passing underneath – neither was any required - although instinctively he pushed the ac nose down slightly. He flew past the white helicopter leaving it about 30m away to starboard on a similar heading and 300ft above his ac. He added that it was a very close encounter, but it was obvious he would pass beneath it; he assessed there was a “low” risk of a collision.

THE BELL 206 PILOT reports his helicopter had a red & white colour scheme and the HISL was on whilst operating VFR on an instructional sortie, about 1000ft below cloud with an in-flight visibility of 10nm whilst in receipt of a FIS from GLOSTER APPROACH on 128.55MHz. He had just completed a 360° clearing turn some 6nm N of Gloucestershire Airport, prior to entering into a practice autorotation from about 1600ft ALT. Whilst eastbound descending through 1000ft ALT [about 800ft agl] in autorotation at 70kt and preparing to recover by about 700ft ALT [about 500ft agl] heading E, a jet was first seen directly ahead, going away fast in level flight having just flown about 400ft underneath his helicopter. The jet was not seen during his clearing turn and he assessed the risk as “low” – because he was just recovering from the autorotation.

THE HARRIER GR7 PILOT’S STATION comments that the circumstances of this Airprox are simple and require no further comment. The pilot assiduously checked all the NOTAM/CANP/PINS warnings etc before flight and noted a CANP at this exact position. However, the warning expired at 1200 UTC - over 2 hours before the Airprox occurred. There was a concern that the CANP might have been extended but not notified to flying units.

UKAB Note (1): STC Ops LF staff report that the CANP had not been extended outside the NOTAM’d period.

AIRPROX REPORT No 196/03

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

HQ STC comments that the late pickup of this helicopter was compounded by the helicopter transitioning from high to low during a practise autorotation. This would have been unexpected by the Harrier pilot and also possibly obscured by the canopy rail. Clearly the only lesson to be learned from a military perspective is to always expect the unexpected - especially from behind a blind spot.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It was plainly unfortunate that the helicopter pilot's clearing turn had not enabled him to spot the fast Harrier jet approaching rapidly from the W, beneath his ac. Evidently the camouflage scheme of the jet against the backdrop of the terrain when viewed from the elevated position of the helicopter cockpit had defeated visual acquisition by the B206 crew at a critical stage. A helicopter pilot member explained that the 360° turn would have taken about 10-15 sec to accomplish, so the GR7 would have been at least 1½ - 2nm away at the start of this turn, which coupled with any time settling into the autorotation probably made the jet undetectable at range. Therefore, once the turn was completed with the B206 steady eastbound he had lost the opportunity to forestall this close quarters situation. Having initiated the autorotation at a rate of descent in the order of 900-1000ft/min there was no further opportunity for the B206 pilot to spot the jet approaching from astern.

The Board appreciated the very candid account provided by the reporting Harrier pilot, who revealed that he did not see the B206 until a few sec before he passed underneath it, just to port. The members wondered why the GR7 pilot had not spotted the B206 beforehand; the helicopter should have been clearly sky lined above him and the added movement of the clearing turn and the descent should have all drawn attention to it. Nevertheless, a helicopter pilot member added that the B206 is a small helicopter and with a partially white colour-scheme seen here against cloud, coupled with the 'tail-on' aspect it would have been very difficult to spot. Whereas the 'bubble' type canopy of the GR7 facilitates lookout, members noted the obscuration caused by the canopy arch mentioned by HQ STC, which may have been a factor here. A fast jet pilot member opined that in the demanding low-level environment with a 'letter-box' style lookout scan, the GR7 pilot would have been somewhat startled when the B206 unexpectedly came into view from above before passing down the starboard side. The Board agreed unanimously that this Airprox had resulted from a very late sighting of the B206 by the Harrier GR7 pilot.

As the helicopter pilot was oblivious to the jet approaching from astern, only the GR7 pilot could have influenced the outcome here, but with only 2sec warning there was very little the jet pilot could have done to change his flight-path significantly. The reported 300-400ft vertical separation was fortuitous, as the Harrier pilot's instinctive 'push' would not have increased the vertical separation markedly. However, this coupled with the 30m horizontal separation was sufficient to ensure that a collision was averted. Though the GR7 pilot said he had realised instinctively that he would pass clear, in the circumstances described the Board concluded that safety of the ac involved had not been assured.

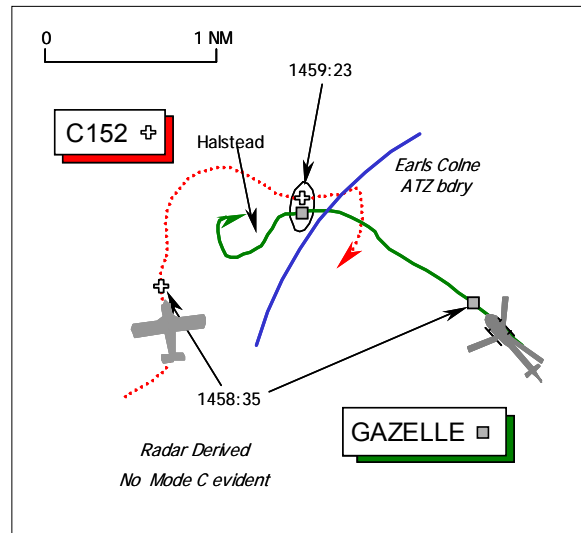
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A very late sighting by the Harrier GR7 pilot

Degree of Risk: B.

AIRPROX REPORT NO 197/03

Date/Time: 5 Dec 1459
Position: 5156N 0039E (Halstead)
Airspace: UKDLFS/FIR (Class: G)
Reporting Ac Reported Ac
Type: Gazelle AH1 C152
Operator: HQ DAAvn Civ Club
Alt/FL: 1000ft 1200ft
 (QNH 1030mb) (QFE 1020mb)
Weather VMC HAZE VMC CLOC
Visibility: 6-8km 25km
Reported Separation:
 300ft H/100ft V 300m H/300ft V
Recorded Separation:
 0·13nm/250m H

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

THE GAZELLE AH1 PILOT reports his helicopter has a grey & green camouflage scheme and the HISLs were on whilst operating VFR under a FIS from WATTISHAM APPROACH (APP) on 291·12MHz in hazy conditions with a visibility of 6-8 km. A squawk of A4535 was selected, but neither Mode C nor TCAS is fitted.

Approaching Halstead at 70kt heading 270° flying 'into sun' in level cruise at 1000ft QNH (1030mb) he spotted a high wing light ac (LA) less than ½nm away. He turned L to avoid the LA – a white C152 with a red stripe – (because he also needed to avoid the built-up area) and descended, as the LA passed 300ft away to starboard some 100ft above his helicopter. He assessed the risk as "medium".

THE C152 PILOT reports her ac has a white & red colour-scheme and the anti-collision beacon was on whilst conducting a local flight from Andrewsfield VFR and in communication with Andrewsfield RADIO A/G station on 130·55MHz. A squawk of A7000 was selected with Mode C switched on. Flying at 1200ft QFE (1020mb), abeam Halstead town heading 150° at 90kt, the helicopter – with a bright nose light - was spotted 5nm away flying towards her ac. In case the helicopter pilot had not seen her Cessna, she turned L, whereupon the helicopter commenced a dive and passed about 300m away to starboard and some 300ft below her ac. She opined that the Gazelle pilot was flying into the sun so might not have seen her Cessna until she turned; furthermore they were not on the same frequency.

THE WATTISHAM APPROACH CONTROLLER (APP) reports that he was working the Radar Approach position under a light traffic loading and had been providing a FIS to the Gazelle who had called about 5 min earlier. Due to the range and altitude of the ac, communications had initially been difficult but after finally establishing good 2-way contact, he realised the ac was not squawking the assigned code and requested the pilot to recycle. As the squawk appeared he noticed it was in close proximity to a A7000 squawk not displaying any Mode C. As a precaution he called the traffic to the Gazelle pilot who advised that he was visual with it. Some minutes later the Gazelle pilot said he wanted to file an Airprox against the LA so the details were noted. After a period of radar tracking and the assistance of Andrewsfield aerodrome, the other ac involved was identified as the C152.

[UKAB Note (1): The Debden radar recording shows the subject ac manoeuvring in the general vicinity of Halstead for some minutes before approaching each other from opposite directions – the Gazelle from the SE through the Earls Colne ATZ and the C152 from the NW. At 1458:35, the Gazelle is shown

AIRPROX REPORT No 197/03

squawking the assigned code of A4535. The ac converge as reported and pass 'starboard to starboard' abeam one another at 1459:23, 0.13nm/250m apart. No Mode C is evident from the C152 at all, although the pilot reports it was switched on.]

[UKAB Note (2): The UK AIP at AD 2-EGSR-1-1 notifies the Earls Colne ATZ as a radius of 2nm centred on RW06/24, extending from the surface to 2000ft above the aerodrome elevation of 227ft amsl, active in winter 0900 - Sunset. The Mil AIP at Vol 3 Pt 1-2-10-3 entreats military pilots to avoid Earls Colne by 2nm radius.]

ATSI reports that the Gazelle pilot free-called Wattisham APP at 1452:30, on UHF stating that he was at Andrewsfield requesting a FIS. Initially, the controller was unable to establish satisfactory two-way communications and some messages were relayed via another helicopter in the vicinity. Satisfactory RT contact was established just before 1455, the controller issued a squawk and confirmed that a FIS was being provided. Further difficulties were experienced with communications and at 1459, the pilot was asked to recycle his squawk of A4535. The controller then confirmed he could see the squawk and advised of traffic ½nm N of the helicopter, whose crew reported visual with it.

Shortly before 1503, the Gazelle pilot called the Wattisham APP controller on VHF and stated that he wished to file an Airprox. Details were taken and the controller established that the other ac involved was the one that he had informed the helicopter pilot about.

HQ JHC comments that this Airprox was reported due to the late sighting of the Cessna by the Gazelle pilot, probably due to the haze and the fact that they were flying into the sun. As the Cessna pilot was visual with the Gazelle throughout this incident, it would appear that there was no risk of collision. The Wattisham APP controller is to be congratulated on his efforts to ensure visual contact was made with the conflicting traffic under the FIS.

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

Though this Airprox had occurred in the vicinity of Earls Colne ATZ – indeed both ac flew into the ATZ it would appear either before or after the incident – this was not relevant to the Airprox itself which occurred outside the ATZ in the unregulated airspace of the Open FIR where see and avoid prevails. Nevertheless, members opined that ATZs should be avoided by as great a margin as feasible where the sortie allowed.

It was reported that the C152 pilot flying at 90kt had spotted the Gazelle some distance away and apparently before the reverse held for the helicopter pilot. Some thought the reported range of 5nm might have been a little over optimistic, for if the C152 pilot had intentionally closed to a range of 300m - a distance entirely of her choosing - after sighting the helicopter then this was too close. Nonetheless, she had astutely acted on the assumption that the Gazelle pilot had not seen her ac beforehand and the avoiding action turn certainly allowed her to keep options open and afforded her more room to manoeuvre if need be. From the Gazelle pilot's perspective flying more slowly at 70kt he was evidently unaware of the LA closing from the NW until the Wattisham APR wisely passed traffic information; this heads-up had helped him acquire the LA and facilitated appropriate avoiding action. The Board commended the APR for this conscientious action while providing a FIS. The combined effect of the avoiding action turns by both pilots at relatively low speed in this instance ensured that separation was not eroded below 250m – according to the radar recording. Though it was not feasible to determine the vertical separation that pertained without mutual Mode C indications, members reinforced the wisdom of switching on Mode C (if fitted) every time the transponder was in use. This can assist controllers immensely when passing traffic information and ensure the fullest traffic information is provided to pilots.

The Board concluded that this Airprox had been the result of a conflict that had been resolved by both pilots, whose combined actions had removed any risk of a collision.

PART C: ASSESSMENT OF CAUSE AND RISK

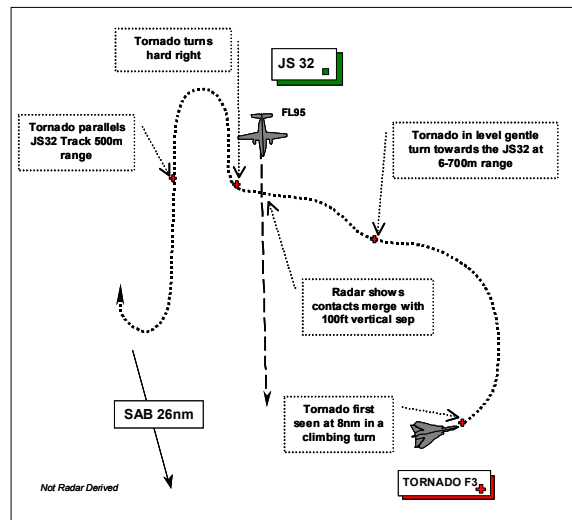
Cause: Conflict resolved by both pilots.

Degree of Risk: C.

AIRPROX REPORT No 198/03

AIRPROX REPORT NO 198/03

Date/Time: 8 Dec 1426
Position: 5620 N 00145 W (26 NM N of SAB)
Airspace: Scottish FIR (Class: G)
Reporting Ac Reported Ac
Type: Jetstream 32 Tornado F3
Operator: CAT HQ STC
Alt/FL: FL95 10250ft
(RPS 1016mb)
Weather VMC CAVOK VMC CAVOK
Visibility: >10km >10km
Reported Separation:
100ft V 0 H 500ft V
Recorded Separation:
100ft V after Contacts Merged



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE JETSTREAM 32 PILOT reports flying a red white and blue ac with nav lights, strobe lights and beacons selected on squawking the assigned code with mode C, but with no TCAS fitted, on a scheduled passenger flight from Aberdeen to Teesside under a RIS from ScACC. While heading 172° at 180kt and level at FL95, following TI, they gained visual contact with another ac, subsequently identified as a Tornado, at 8nm in their 10 o'clock at about the same level. The Tornado was performing unpredictable high-energy manoeuvres and appeared to be a single ship. It appeared that he altered his course and performed a climbing turn as if he had seen them then entered a level gentle turn towards them at a distance estimated to be 6-700m and at 100ft above them he rocked his wings and then again level passed directly over the nose of our ac still 100ft above. He performed a "sharp" turn to the right before turning again to fly parallel to our track at the same height and speed. He maintained this for a few minutes before turning right.

He did not take any avoiding action since the Tornado's flightpath was unpredictable and any avoiding action may have increased the risk. He assessed the risk of collision as being high.

THE TORNADO F3 PILOT reports flying a formation air defence instructional sortie in a grey ac with HISL selected on squawking 7000C but with no CWS fitted and, due to the nature of exercise being flown, operating on a discrete frequency and not in receipt of an ATC service. While conducting a visual E/W CAP, passing heading 320° at 230kt turning left through N, they picked up a radar contact at 6nm, initially in their 12 o'clock co-altitude at 9000ft and heading S. In preparation for the next part of the exercise the student navigator dumped the track from the computer. To ensure vertical separation he initiated a turn to the NW climbing up to 10000ft and after roll out both crew members checked the right side for possible traffic. The ac was then repositioned and the roll reversed in order to check both sides and a white Jetstream with red markings was sighted at a distance of ¼nm, 500ft below on their right hand side. He did not assess the degree of risk.

THE ScACC CONTROLLER reports that the JS32 was routing from Aberdeen to Teesside direct at FL95 outside CA under a RIS. When 26nm N of SAB the JS32 came into conflict with unknown traffic squawking 7000 so TI was passed, updated and the JS32 pilot advised that he was visual. Radar indicated 100ft separation at the point that the contacts merged. And he continued to pass TI until the conflict was resolved.

During the time of the incident the Sector was busy, operating with tactical and planning controllers and holding was in progress for approaches to both Glasgow and Edinburgh.

UKAB Note (1): The RT recording shows that the first TI was passed by ScACC to the JS 32, warning of traffic at approximately the same level at 15nm. The JS 32 pilot called visual with the Tornado 1min later (at this time in his 10.30 position, range about 7nm and turning towards) and the controller continued to update the TI.

UKAB Note (2): The recording of Lowther Hill Radar provided by Scottish Military Radar was of poor quality and barely usable. It did however, show the 2 ac approaching each other, the JS32 on a steady S heading and the F3 manoeuvring to the S of it. The JS32 maintains a heading of about 170° and a height of FL95 while the Tornado stops its turn heading NW, directly towards the JS32. The Tornado initially displays FL90, climbs to FL102 then descends to FL94 after the contacts merge, later climbing again. Due to the very large scale of the recording it was not possible to use it to construct the diagram above. Fortunately, however, the JS32 pilot provided a very precise drawing of the incident and since the Tornado crew did not see anything until a very late stage; the diagram above is based on the JS32 pilot's description of the events.

THE TORNADO Station commented that this incident again highlighted the necessity for robust and conscientious lookout procedures and for the use of all sensors to build and preserve situational awareness. In this case greater separation could have been achieved had the student navigator maintained the track on his radar until they achieved visual acquisition; a more experienced navigator most would most probably have done so. This student has learned a valuable lesson that collision avoidance is a two-way contract.

ATSI reports that the JS32 was routing from Aberdeen to Teesside via the Newcastle VOR. It was maintaining FL95 and in receipt of a RIS from ScACC, Tay Sector.

When some 26nm N of the SAB, the controller observed unknown traffic at FL91, tracking E, approximately 15nm to the S of the JS32. This was the subject Tornado which shortly afterwards turned left on to a heading of N. The JS32 pilot was given updated TI and he reported seeing the Tornado when it was at a range of 8nm. The Mode C showed the Tornado climbing from FL91 to FL94 before turning head-on towards the JS32. The Mode C increased to FL102 before dropping to FL94 as it passed 100 feet directly overhead the JS32.

The TAY Sector Controller complied with all the requirements of a RIS and updated the TI after the pilot had reported visual with the Tornado.

HQ STC comments that the area where the Airprox occurred is very congested. Since the move of the F3 Operational Conversion Unit (OCU) from RAF Coningsby to RAF Leuchars, the oversea area between SAB and ADN has been heavily utilised by their ac. Although this marked increase in usage has not yet attracted the designation of an AIAA this is currently under consideration; this would then highlight the risks of transiting this busy airspace to other ac at the planning stage.

The Tornado crew were misguided not to obtain a radar service although, in mitigation, there may not have been one available that could give the 'quiet' service required for instructional sorties. Having tracked the JS32 briefly on their radar at 9000ft (in fact FL95), and made a positive effort to avoid by 1000ft, the Tornado crew would have been wise to increase this margin due to the inaccuracy of the radar height read-out in Track While Scan (TWS) mode. Their climb to FL102 did initially give 700ft vertical separation however, the next Mode C return of FL94 *after* the contacts merge indicates that this was eroded and the actual separation was somewhere between the 2 figures. That said, it did not unduly concern the Tornado crew, but caused a considerable amount of concern to the JS32, which indicates that the separation was of the order of hundreds of feet. The crew undoubtedly did not see the JS32 during their gentle climbing turn to the left; they would have been 'belly up' for 90° of the 180°

AIRPROX REPORT No 198/03

turn. However, their subsequent efforts and 'belly check' revealed just what they were looking for - an unsighted ac! This is the manoeuvre that the JS32 possibly described as "unpredictable". We would hope that our crews would learn from this Airprox that wider avoidance margins of unknown traffic (if at all possible) should be considered in the interest of safety and not causing concern to other air users.

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 thought that there were two equally weighted causes of this Airprox emanating from the crews of both ac involved. Both ac had been operating quite legitimately in Class G airspace and had a responsibility to see and avoid other ac. The F3 pilot became aware of the presence of another ac at a late stage from onboard sensors; the Jetstream pilot sensibly opted for a radar service which disclosed the presence of the F3 much earlier. Despite this the conflict still occurred.

Specialists considered that there had been a breakdown in the inter-cockpit information flow in the F3, which allowed the student navigator to 'dump' the safety critical track of the Jetstream from the ac computer. This resulted in the pilot not being given full displayed information on the other ac, he was however aware of its presence and approximate position although not whether it was civil or military or its heading. This being the case it would have been prudent to take earlier action to establish its identity and having found it to be a non-player, give it a much wider margin. Although this was an instructional sortie for a student navigator the instructor pilot should assume a wider than normal responsibility for the safety aspects of the sortie. It is often difficult to determine the relative priorities between operating in a quiet environment and obtaining radar information, but there is little doubt that, in this case, a RIS would have disclosed the Jetstream earlier and that it was a non-participating civilian ac.

The Jetstream, on the other hand, was in receipt of a very good RIS from ScACC but chose not to make use of any of the information provided. Professional pilot Members considered that when operating outside the protection afforded by CAS there is little point in obtaining radar information unless it is used as a tool to avoid other ac. By deliberately opting not to take any avoiding action he had increased the risk of a conflict and Members considered that early lateral or vertical avoiding action would have been prudent even if subsequently it had to be modified. Notwithstanding that they had the benefit of hindsight and had access to 'the big picture' the Board considered the Jetstream pilot to have been unwise in believing that the F3 pilot had seen his ac and would give way; this view was vindicated by the F3 pilot's reported late sighting.

Since both pilots had seen each other albeit at a very late stage by the F3 pilot, there had not been any real possibility that the ac would collide. However, since the Jetstream pilot did not take any avoiding action and the F3 pilot did not take effective avoiding action, the safety of the respective ac had not been assured.

The Board noted that this incident occurred in very congested airspace and were informed by HQ STC and by NATS that both organisations were acutely aware of the problem and are actively seeking ways of reducing the risk to both civil and military traffic legitimately operating in the Aberdeen to Newcastle oversea area.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: a. Very late sighting by the F3 crew.

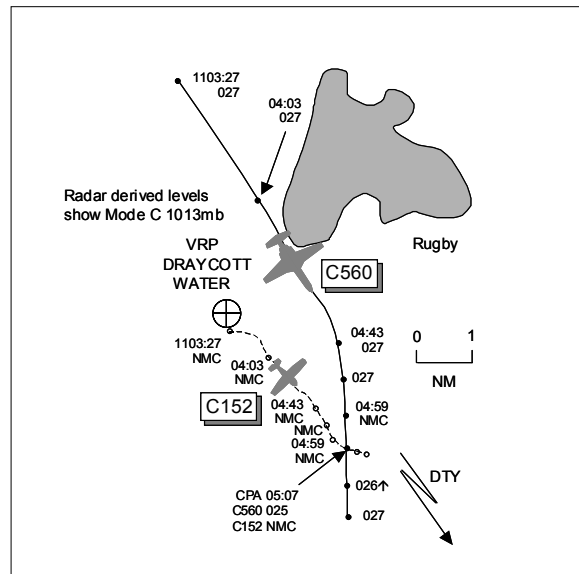
b. The Jetstream pilot took no avoiding action.

Degree of Risk: B.

AIRPROX REPORT No 199/03

AIRPROX REPORT NO 199/03

Date/Time: 15 Dec 1105
Position: 5217N 0116W (5nm S of Rugby)
Airspace: FIR (Class: G)
Reporting Ac Reported Ac
Type: C152 C560
Operator: Civ Trg Civ Pte
Alt/FL: 3125ft 3000ft
(QNH 1030mb) (RPS 1023mb)
Weather VMC CLNC VMC CLNC
Visibility: >20km >40km
Reported Separation:
150-200ft V nil H 300-400ft V nil H
Recorded Separation:
returns merge



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE C152 PILOT reports flying a dual Flying Instructor's Course (FIC) sortie from Coventry and in receipt of a FIS from Coventry on 119.25MHz squawking 4650 NMC. The visibility was >20km in clear sky VMC the ac was coloured white and the anti-collision light was switched on. About 5nm S of Rugby he had almost completed HASELL checks prior to stalling, with lookout as the only outstanding check. Heading 130° at 90kt and 3125ft QNH 1030mb, he looked over his L shoulder - he was seated on the LH side - prior to the lookout turn, and saw a white Citation jet appear from behind the door post in his 7 o'clock position, only 300-400yd away in level flight about 150-200ft below. He had seen it too late to take any avoiding action as it had emerged from a blind spot behind and below his ac. As the Citation passed underneath he recognised the registration letters as a Coventry based ac. He thought that had the ac carried an unknown registration, he doubted if would have had time to read it fully as the ac was only in sight for about 2sec before it disappeared underneath his ac. He had been about to draw his student's attention to their present altitude, which was 125ft above their intended level of 3000ft. The student saw the Citation exit from below in his 1-1:30 position without altering its heading and shortly thereafter it commenced a climb. He thought the other ac was probably cruising at 200-250kt TAS and assessed the risk as high had the Citation crew not seen him or low if they had.

THE C560XL CITATION PILOT reports en route from Manchester to Oxford VFR at 3000ft Barnsley RPS 1023mb and in receipt of a FIS from Birmingham squawking an assigned code with Mode C. The visibility was >40km in VMC and the ac was coloured white with blue/red stripes. Near to Rugby heading 190° at 250kt flying into sun, TCAS gave a TA alert on traffic with no height readout at a range of 2nm; the display range was set at 6nm. Without any height indication, he thought that visual acquisition of the target was essential prior to taking action. Both he and the FO saw the conflicting traffic visually in their 1 o'clock range 1-2nm closing rapidly on a crossing track of about 130° at the same level. He disconnected the AP and commenced a slow non-aggressive, shallow descent (in view of being reported on, not aggressive enough) and estimated that they passed 300-400ft immediately underneath the other ac, a C152, before quickly diverging from its path. He assessed the risk as low-medium.

UKAB Note (1): Met Office archive data shows the Coventry METAR as EGBE 1050Z 32006KT 290V350 9999 FEW038 04/00 Q1030= and the Barnsley RPS 1100-1200 was 1023mb.

ATSI comments that the C152 departed Coventry at 1056 on track to the 'local area' VFR. Although not stipulated, this area is recognised locally as being to the E, in the region of Rugby, Daventry and Draycott. Approximately 3min later, the C560 pilot contacted Coventry Tower/Approach, reporting VFR at 3000ft on the RPS, routeing LIC to DTY then Oxford. The pilot estimated passing 3nm E of CT at 1102. The pilot was informed that CT was unserviceable and *"I just have a couple of contacts operating er local area VFR"*. Establishing that the ac was working Birmingham, the Coventry Controller offered the choice of a FIS with him or to stay with Birmingham, as they would probably be able to see the local traffic. The pilot opted to continue working the latter.

About 4min before the Airprox, which occurred at 1105, the C152 was informed that the ATS being provided was a FIS and TI was passed about two other ac operating in the 'local area'. No mention was made about the C560 transiting through the area. Other local traffic was warned about the C152.

The Airprox occurred in Class G Airspace, with both flights operating VFR under a FIS, the C152 with Coventry and the C560 with Birmingham; neither ac was radar identified. The MATS Part 1, Section 1, Chapter 1, Page 2, describes a FIS as *"a non-radar service provided, either separately or in conjunction with other services, for the purposes of supplying information useful for the safe and efficient conduct of flights. Controllers are not responsible for separating or sequencing aircraft."* Additionally, *"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."* Not utilising their radar display, Birmingham would not have been aware of the presence of the C152. Coventry was working the C152 and also was contacted by the C560 pilot who passed appropriate information about his flight. It was noticeable from the RT recording that the Coventry ADC/APP was, at times, using the ATM to pass TI to flights operating in the 'local area'. The Coventry MATS Part 2 allows use of the ATM to pass TI but states *"it must not be used as a surveillance radar by the Air Controller"*. Arguably, sufficient details were given by the C560 pilot to prompt the Coventry Controller to pass TI on to the C152 pilot. However, he believed that Birmingham, whilst working the C560, would have seen the local traffic on the radar display as it would have been squawking the Coventry conspicuity code 4650 (Coventry not SSR equipped). In any case, he did warn the C560 pilot of the presence of VFR traffic operating in the local area. Additionally, the C152 was on frequency when the C560 pilot made a comprehensive report of his intentions with regard to routeing and altitude.

UKAB Note (2): Analysis of the Clee Hill radar recording at 1103:27 shows the C152 tracking E at Draycott Water VRP squawking 4650 with NMC with the C560 4.8nm to its NNW tracking 160° squawking 7000 indicating FL027 (3000ft RPS 1023mb or 3210ft QNH 1030mb). Just over 30sec later the C152 is seen tracking a nominal SE'ly track as the Citation passes W beam Rugby. 40sec later, as the C560 steadies on a 180° track, the C152 is in its 1 o'clock range 1.3nm. The subject ac converge with a constant relative bearing, NMC is shown on the Citation on the last radar sweep (1104:59) prior to the CPA, which occurs at 1105:07 as the radar returns merge, the C560 indicating FL025 (2800ft RPS or 3010ft QNH) whilst the C152 pilot had reported flying level at 3125ft QNH. The next 2 radar sweeps (8sec intervals) show the Citation climbing through FL026 before levelling at FL027, 1.2nm S of the C152.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

This had been an encounter in the FIR where 'see and avoid' pertained with both crews in receipt of a FIS. The C152 instructor had noticed the Citation approaching from behind during his lookout scan and watched it pass underneath by 150-200ft, understandably concerned, in case his ac had gone

AIRPROX REPORT No 199/03

unsighted. Unbeknown to him, the C560 crew with the benefit of TCAS – that only gave a TA alert on the C152 owing to NMC - had been given a 'heads-up' to the Cessna's presence and had waited until visually acquiring it before taking action. The Citation crew had then commenced a descent to pass 300-400ft safely beneath the C152 whilst maintaining visual contact with it. However, with hindsight, the Citation pilot acknowledged that he could have increased the vertical separation. These elements left the Board in no doubt that this conflict had been resolved effectively by the C560 crew whose actions had removed any risk of collision.

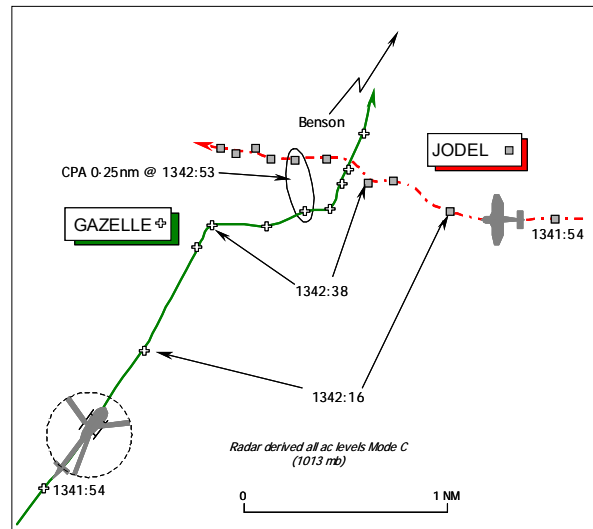
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict resolved by the C560 crew.

Degree of Risk: C.

AIRPROX REPORT NO 200/03

Date/Time: 17 Dec 1342
Position: 5135N 0108W (2nm SW of Benson)
Airspace: Benson MATZ/ATZ (Class: G)
Reporting Ac Reported Ac
Type: Gazelle Jodel DR1050
Operator: JHC Civ Pte
Alt/FL: 2000ft 2000ft
 (QFE) (QFE)
Weather VMC NR VMC SKC
Visibility: 20km+ 40nm
Reported Separation:
 0.3nm Not seen
Recorded Separation:
 0.25nm H

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

THE GAZELLE PILOT reports his helicopter has a grey-green camouflage scheme but the HISL was on whilst conveying three aircrew passengers from Middle Wallop to Wattisham. He was flying out of sun and in receipt of a FIS from Benson ZONE, squawking the assigned code but neither Mode C nor TCAS is fitted.

Flying straight and level at 2000ft Benson QFE, heading 047° at 130kt a light ac (LA) appeared from behind his helicopter's structure to starboard about ½nm away at the same height. Immediately on sighting the white aeroplane he broke hard R and then reversed the turn passing back onto heading to re-acquire the LA which he passed behind about 0.3nm away. It maintained its course straight and level throughout and he assessed the risk as "high".

THE JODEL 1050 PILOT reports his aeroplane has a red & white colour scheme, but neither lighting nor SSR is fitted. He departed from Benson VFR and was instructed by TOWER to switch to APPROACH (APP) on 136.45MHz. Local procedures require pilots to be in contact with APP before climbing above 1300ft QFE, but despite several attempts at reselecting the frequency he could not establish contact with APP on 136.45MHz. As the prevailing weather was exceptionally clear with no cloud he elected to turn onto W, continue the climb to 2000ft QFE and call Benson ZONE on 120.9MHz. There was a delay before he could contact the controller because of heavy RT traffic (it was the 100th anniversary of flight). Although the visibility was excellent - except within about 10° of the bright low sun - neither the helicopter (which he believed might have been masked by the sun) nor any other near traffic was seen at all. Post flight-testing proved that although higher frequencies could be selected, the radio fitted did not operate above 135.97MHz. Previous flights had used 120.9MHz and this was the first time he had attempted to use 136.45MHz.

MIL ATC OPS reports with RT transcript that the Jodel pilot called Benson TOWER (ADC) for taxi clearance at 1329:47 and was instructed to taxi for RW19. The ADC prenoted the departure to APPROACH (APP) at 1334:34 for a "...VFR departure to the west", whereupon APP enquired if "...he could take 136.45 [MHz]"? The erroneous response from ADC was "...he certainly can" - [though the ADC did not question the pilot] APP allocated a squawk of A7360 [though the ac was not fitted with SSR] and reiterated the departure frequency - 136.45MHz. ADC passed the assigned squawk and frequency to the Jodel pilot at 1335:02, "...on departure squawk 7360 and to APPROACH 136.45", which the pilot acknowledged forthwith - "7360 and APPROACH 136.45 er [C/S]". The LA was cleared for take off from

AIRPROX REPORT No 200/03

RW19 at 1338:31, and the Jodel pilot reported switching to APP over 1min later at 1339:51, which the ADC acknowledged. However, 6sec after the Jodel pilot had transferred to APP the ADC received a call from Benson ZONE about a MATZ crosser – the Gazelle.

[UKAB Note (1): Meanwhile, the Gazelle pilot had free-called ZONE requesting a transit through the Benson MATZ under a FIS at 2000ft. ZONE passed the QFE (1015mb) and at 1337:17, requested that the Gazelle pilot fly at 2000ft, which he agreed - *"1015 fly at 2000ft [C/S]"*. At 1340:00, the Gazelle pilot queried *"...confirm MATZ penetration via the overhead?"*, whereupon 5 sec later ZONE replied *"affirm MATZ penetration approved at 2000ft QFE"*.]

At 1341:38, the Jodel pilot called ZONE on 120.9MHz *"...on departure with negative contact on 136.45"*. ZONE acknowledged the call and requested the Jodel's *"...level passing"* at 1341:45, but no response was received from the pilot. Nearly 20 seconds later, ZONE tried to establish 2-way communication with the Jodel pilot again but again there was no response. Just under a minute later at 1342:37, a transmission was received by ZONE, which was inaudible apart from the callsign of the Jodel. Thus no 2-way communication was established between ZONE and the Jodel before the Airprox. At 1343:47 the Gazelle pilot reported the Airprox *"...3 miles south of the field, same height, 2000 ft crossing from my right to my left, one fixed wing (garbled) aircraft at 2000ft I had to avoid"*. The Gazelle pilot left the ZONE frequency at 1350:23.

The Heathrow radar video recording shows the Gazelle 4nm SW of Benson at 1341:54, tracking 020° as the Jodel appears on radar at 1341:46 on the Benson 170° radial 2nm; neither ac is fitted with Mode C. The helicopter continues to track towards the Benson overhead whereas the Jodel is observed in a right turn onto 280°. The subject ac converge until 1342:45, when the Gazelle pilot executes a hard R turn onto E before passing 0.25nm 'port to port' with the aeroplane. After turning L to regain track the Gazelle then passes astern of the Jodel.

The Jodel ac was prenoted for departure from ADC to APP, when the APP controller questioned whether the Jodel could accept the departure frequency of 136.45MHz, the ADC confirmed [erroneously] that the ac could. Furthermore, APP issued a Mode A code along with the departure frequency. ADC passed this to the Jodel pilot who accepted both without demur. The Benson ATC 'Electronic Tote' provides details of whether station based ac and regular visitors are able to accept frequency 136.45MHz or not; the Tote records that the Jodel can neither accept the frequency nor is SSR equipped. The ADC demonstrated poor awareness in accepting this frequency and SSR code from APP and offering it to the Jodel pilot, who moreover, did not query this when given to him on RT. The Jodel pilot intended to carry out a VFR departure for a local flight to the west of Benson. The Benson Flying Order Book (FOB) states that: *"VFR departures are to climb on runway track to 1300ft Benson QFE, calling Benson APPROACH before turning onto the required outbound heading"*. Whereas the ADC received a call from APP passing traffic information about the Gazelle transiting the MATZ, unfortunately, it was made 6sec after the Jodel had transferred to APP. On climbout, the Jodel maintained runway heading and when unable to contact APP on 136.45MHz he called ZONE on 120.9MHz at 1341:38. ZONE placed the Jodel under a FIS and requested the Jodel's level passing, but the pilot did not respond to this call and it was not until just under 20sec later that ZONE tried once again to establish 2-way communications with the pilot at 1342:04, but still to no avail after the LA had turned R onto a track of 280°. ZONE was then occupied by a series of protracted transmissions with a PINS helicopter that did not allow for the Jodel's level to be passed or requested again by ZONE. Some 40 sec after the Gazelle had declared the Airprox, ZONE was able to establish 2-way RT with the Jodel pilot at 1344:06, and ascertain that the Jodel was flying at 2000ft Benson QFE and had turned right onto a northwesterly track into conflict with the Gazelle. The Gazelle pilot was forced to initiate a hard right turn to pass port to port and subsequently behind the Jodel. ZONE had not called the departing Jodel to the Gazelle as he had expected the Jodel to be not above 1300ft as per the FOB and was under no obligation to call the traffic. The order in the FOB pertaining to VFR departures is specific to aircraft, which can accommodate the standard APP frequency, it would be more pertinent for the Order to cover aircraft that will contact ZONE on departure as well as those who will contact APP. This may avoid any

confusion for crews and ensure that the VFR departure profiles remain standard regardless of frequency.

HQ JHC comments that this Airprox occurred in good weather conditions, and it would appear within the Benson MATZ. If this is the case, it is surprising that the Gazelle was not warned of the Jodel's presence by ATC. Whilst the difficulty in making contact with Benson ATC may have precluded traffic information being passed to the Jodel pilot, there is little substitute for good lookout when operating VFR. In this case, lookout was hindered by the Jodel pilot flying into sun, and by the Jodel being masked by the Gazelle ac structure. It is fortunate that the Gazelle pilot saw the Jodel in time to take appropriate avoiding action.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board recognised from the Jodel pilot's own report that he was familiar with local VFR departure procedures and was required to comply with them. But he did not do so. Instead he had elected to climb above the stipulated height of 1300ft QFE when he turned westbound, though unable to raise APP on the inappropriate frequency given to him by the ADC within his departure instructions. Although the wording of this procedure within the FOB could be taken as being slightly ambiguous, the Jodel pilot's account was in accord with accepted practice and the Board was briefed that the FOB was being amended to make this more plain. Thus whatever procedural separation ATC had presupposed had existed between the MATZ crosser and the departing aeroplane, was immediately eroded. Although the LA pilot reports that the prevailing weather was exceptionally clear with no cloud and excellent visibility when he climbed up, he did not see the helicopter that was there to be seen.

For his part the Gazelle pilot had taken care to check that he was able to transit through the Benson MATZ at his requested height of 2000ft Benson QFE before he crossed the Zone boundary, which had been affirmed by the ZONE controller. This was sound airmanship on the Gazelle pilot's part, had occurred barely 3min before the Airprox and should have been enough to ensure safe passage through the Zone at that height. Whilst within the MATZ the Gazelle pilot was required to comply with ATC instructions that were mandatory, and had done so with the probable expectation that he would be informed about other traffic 'known' to ATC that might become a factor - in the Board's view a reasonable expectation. Both the ADC and APP were aware that the Jodel was scheduled to depart and it was feasible that the ADC might have forestalled this Airprox at the outset by recognising the limited frequency capability of the Jodel's radio fit. If the ADC had been more astute, or questioned the Jodel pilot if he was in any doubt, then the alternative ZONE frequency could have been offered. For his part APP could also have been aware from the 'tote' that the Jodel was not SSR fitted nor capable of operating on the RT frequency specified, but was evidently misled by the ADC's reply when he questioned this. Moreover, the Jodel pilot himself should have been intimately aware of the capability of his ac's equipment fit and should have realised that he would not be able to communicate with APP nor squawk from the outset. In the Board's view, here was the catalyst to subsequent events and significant contributory factors to this Airprox. If the Jodel pilot had been able to communicate his intentions that he was climbing to the same height as the Gazelle, then it might have broken the subsequent chain of events. Clearly ZONE had briefed APP about the MATZ crosser but it was unclear if ZONE was aware of the departure before the Jodel pilot called him on 120.9MHz. Moreover, if the Gazelle pilot had been aware of the departing Jodel that might have prevented the Airprox. Fate had also 'played a hand' here, as the ADC was not informed about the MATZ crossing by APP until barely 6 sec after the Jodel switched from the TOWER frequency and attempted to call APP. Therefore, out of communication for some min afterward, it was unfortunate that ZONE had not been able to mention the presence of the Jodel to the Gazelle pilot under his control and a debate ensued about the efficacy of calling traffic information under a FIS. However, unlike the provision of an ATS in the Open FIR this

AIRPROX REPORT No 200/03

situation was in a MATZ and involved traffic crossing through it, which moreover was flying at the top height of the Benson ATZ and an ac climbing up through that Zone. Members were keenly aware that information had been available within ATC about both ac involved in this Airprox, which was evidently not passed on to the respective pilots. In the Board's view, the Gazelle pilot should have been informed about the Jodel; even if the latter had maintained 1300ft QFE in accordance with the procedure, then there was still reason enough to inform the helicopter pilot of traffic he would overfly within 1000ft and there was ample opportunity to do so. At least then the helicopter pilot might have been forewarned and looked for the aeroplane rather than being caught unawares. Weighing all these factors carefully, the members concluded that this Airprox had resulted because the Jodel pilot did not comply with the Benson departure procedures and climbed into conflict with the Gazelle, which he did not see.

Although he should not have been placed in this situation, fortunately the alert helicopter pilot spotted the aeroplane over $\frac{1}{2}$ nm away, which enabled him to avoid it and ensured that the two ac remained at least 0.25nm apart. This convinced the Board that the Gazelle pilot's actions alone had entirely removed the risk of a collision in these circumstances. Nevertheless, there were valuable lessons here for pilot and controller alike.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Jodel pilot did not comply with the Benson departure procedures and climbed into conflict with the Gazelle, which he did not see.

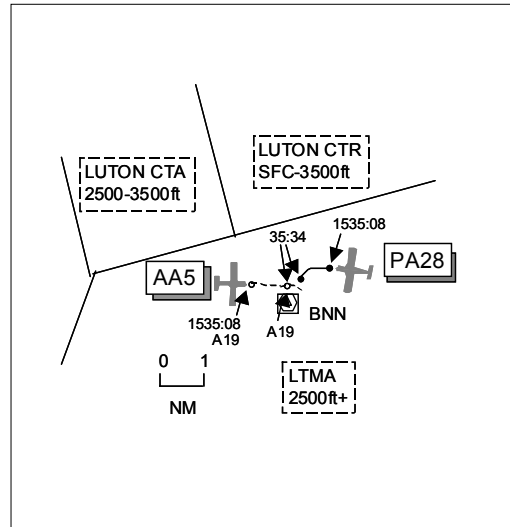
Degree of Risk: C.

Contributory Factors:

1. The Jodel pilot accepted a squawk and RT frequency, which he could not operate on.
 2. The ADC passed a squawk and RT frequency, which he should have known was outside the capabilities of the Jodel's equipment fit.
-
-

AIRPROX REPORT NO 202/03

Date/Time: 17 Dec 1536
Position: 5144N 0033W (BNN VOR)
Airspace: FIR (Class: G)
Reporting Ac Reported Ac
Type: AA5 PA28
Operator: Civ Club Civ Trg
Alt/FL: 1800ft 2000ft
(QNH 1022mb) (QNH)
Weather VMC CLNC VMC HAZE
Visibility: 10km 3000m
Reported Separation:
nil V 50m H nil V 0.5nm H
Recorded Separation:
NR

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

THE AA5 PILOT reports flying en route from Enstone to Elstree VFR with a passenger in the RH seat and in receipt of a AFIS from Elstree on 122.4MHz squawking 7000 with Mode C. The visibility was >10km in clear sky VMC and the ac was coloured white/blue with nav and landing lights switched on. At BNN VOR while listening to other joining traffic on the Elstree frequency, he was visual with one ac and was intending to maintain appropriate spacing from it before establishing himself on a 4nm final for RW26 and reporting his position. Steady heading 120° at 100kt and 1800ft QNH 1022mb, suddenly a white/red coloured PA28 crossed ahead from L to R at the same level, very close estimated to be 50m away; he immediately felt a jolt from the other ac's wake. There had been no time for him to take avoiding action and it appeared that neither had the PA28 pilot. He assessed the risk as very high. Subsequently, he thought that 2 factors had been relevant to this incident. Firstly, his attention had been too focussed on the other traffic ahead. Secondly, although the pilot of the conflicting ac had been responsible for giving way (having his ac on the R), the sun was low and would have been partly in the pilot's field of view. This had been a very sobering experience and certainly the closest encounter he ever wanted to have.

THE PA28 PILOT reports flying a dual training sortie from Luton and not in receipt of an ATS squawking 7000 with Mode C, he thought. He had not been able to obtain a radar service from Luton as ATC were busy. The visibility was poor, 3000m in hazy VMC and the ac was coloured white/red with nav and strobe lights switched on. Near to BNN heading 240° flying into sun level at 2000ft QNH and 100kt, he saw a low-wing single-engined ac coloured white/blue 0.5nm on his RH side at the same level. No avoiding action was taken and the other ac passed behind.

UKAB Note (1): Met office archive data shows the Luton METAR as EGGW 1520Z 18006KT 140V210 CAVOK 05/02 Q1021=

UKAB Note (2): Analysis of the Stansted and Heathrow radar recordings at 1535:08 shows the AA5

1nm WNW of BNN tracking 100° squawking 7000 indicating 1900ft QNH 1022mb with a primary only return 2nm to its NE, believed to be the PA28, tracking 270°. The PA28 is seen to turn L 20sec later onto a SW'y track before fading from radar at 1535:34 with the AA5 in its 1 o'clock range 0.33nm still tracking E at 1900ft QNH 1022mb. The PA28 does not reappear until over 1min later, to the W of BNN, the CPA occurring during this radar fade period.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members wondered how the subject ac could have flown in such close proximity before both pilots had sighted each other. The PA28 pilot had been flying towards a low setting sun in hazy conditions and this would have made visual acquisition of the light coloured AA5 more difficult. Also, the PA28 crew had been engaged in a dual training sortie which is known at times to involve a busy 'heads-in' cockpit environment, perhaps to the detriment of maintaining a good lookout. For his part, the AA5 pilot had been distracted, focussing his attention on following another ac, flying ahead, inbound to join the cct at Elstree. Crucially, both ac were flying near a VOR beacon situated between 2 CTRs; beacons are known to create a 'honey pot' effect where ac are likely to be encountered as pilots use the nav aid for tracking purposes and to ensure they remain clear of CAS. The first time the AA5 pilot saw the conflicting PA28 was as it crossed 50m ahead at the same level with no time to take avoiding action; he immediately passed through its wake. Similarly, the PA28 pilot only saw the AA5 as it appeared on his RH side, he estimated 0.5nm away, at the same level as the cross occurred and it was seen to pass behind. The radar recording shows the PA28 closing on the AA5 at 0.33nm range before fading. This led members to agree that, on the balance of probability, the PA28 pilot's estimation of separation had probably been overly optimistic in the hazy conditions. Understandably, his very late visual acquisition of the AA5 combined with the geometry of the encounter would have left him too little time to gauge distances before the other ac crossed behind. Taking all of these elements into consideration, the Board agreed that the cause of the Airprox had been effectively non-sightings by both pilots, as they had only seen each other as their tracks were about to cross. The separation distances involved had been purely fortuitous, with no time for either pilot to affect the outcome. The Board therefore concluded that in this instance, there had been an actual risk of collision. A lesson for all pilots to take away from this incident is to be extra vigilant when flying near to or approaching VOR beacons while in Class G airspace.

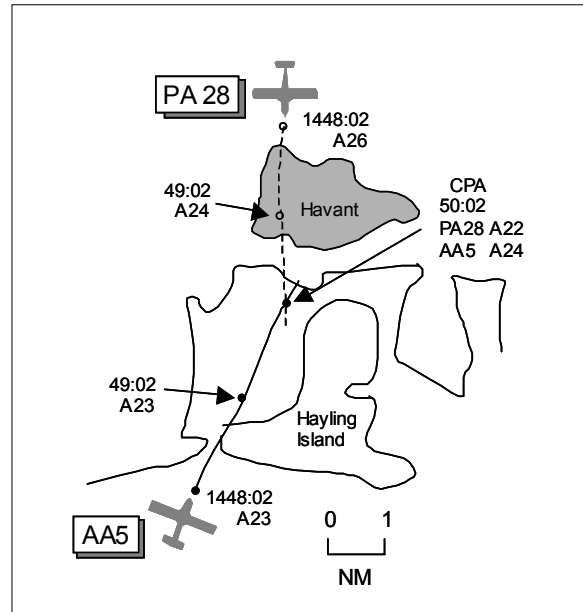
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Effectively non-sightings by both pilots.

Degree of Risk: A.

AIRPROX REPORT NO 203/03

Date/Time: 17 Dec 1450
Position: 5050N 0059W (2nm S Havant)
Airspace: FIR (Class: G)
Reporting Ac Reporting Ac
Type: PA28 AA5
Operator: Civ Club Civ Pte
Alt/FL: 2000-2500ft 2400ft
(QNH 1022mb) (QNH)
Weather VMC CAVOK VMC HZNC
Visibility: NR >10km
Reported Separation:
50-100ft V <100ft V
Recorded Separation:
200ft V

**BOTH PILOTS FILED BOTH PILOTS FILED****PART A: SUMMARY OF INFORMATION REPORTED TO UKAB**

THE PA28 PILOT reports flying a solo local cross-country flight from Blackbushe and he was 'listening out' with Goodwood on 122.45MHz squawking 0444 with Mode C. The weather was essentially CAVOK, the coast was visible from Petersfield, but slight haze/inversion was degrading the visibility when flying into sun. The ac was coloured white with blue/red stripes and the strobe lights were switched on. Near to Hayling Island heading 180° at 90-100kt and 2000-2500ft QNH 1022mb, he had put the map aside and was navigating by reference to the coast having just completed a frequency change from Farnborough to Goodwood. Unusually he had lowered the sun visor because of the low sun angle. He first sighted a conflicting ac, a low wing single engine fixed gear type, possibly white/navy, as it emerged from the sun, from just R of his 12 o'clock range 150-200ft, slightly above him on an almost reciprocal heading; it filled one third of the windscreen horizontally. As he could see the other ac's wheels ahead of him he instinctively pushed hard/forward on the control column causing his map, flight guide and other equipment all to hit the roof; the other ac immediately disappeared upwards from his view. He didn't see it for long enough to gauge whether they would have collided or if the other pilot had taken avoiding action but he estimated it passed 50-100ft overhead, assessing the risk of collision as high.

THE AA5 PILOT reports flying en route from Bembridge to Denham at 2400ft and 90kt squawking with Mode C. The visibility was >10km in slightly hazy VMC and the ac was coloured white/brown with anti-collision beacon and strobe lights switched on. Approaching Petersfield heading 030° workload was high as he was in the process of changing frequency from Solent Zone to Farnborough, 'heads-in' looking for the correct frequency. The skies were busy on the day with many ac airborne to mark the Centenary of Flight anniversary. On looking up he saw a white PA28 to his L 10 o'clock flying straight and level, possibly 400m range but it was difficult to determine, on a crossing track L to R at almost the same level, just slightly below. Immediately he took avoiding action by climbing to the R whilst the PA28 was seen to take avoiding action by pitching down but maintaining heading. He estimated he passed <100ft above the PA28 and he informed the co-pilot of the reason for his actions. His ac may have been unsighted to the PA28 pilot owing to the low sun in his direction of flight. This had been a very late sighting of the other ac and he assessed the risk of collision as high.

AIRPROX REPORT No 203/03

UKAB Note: Analysis of the Pease Pottage radar recording at 1448:02 shows the PA28 1.5nm NNW of Havant tracking 180° squawking 0444 indicating 2600ft QNH 1022mb with the AA5 in his 1 o'clock range 6.5nm tracking 025° squawking 7000 indicating 2300ft QNH. One minute later, the PA28 levels at and maintains 2400ft Mode C and both ac converge on a line of constant bearing, the AA5 indicating a steady 2300ft Mode C until 1449:56. The CPA occurs on the next radar sweep 6sec later, at 1450:02, as both ac returns merge, the PA28 now showing 2200ft descending and the AA5 2400ft climbing.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Both reporting pilots agreed that their very late sightings had caused the Airprox and this was endorsed by the Board. The opportunity had been there for earlier sightings although from the PA28 cockpit, the pilot's lookout had been slightly degraded by the low sun and slight haze. He first saw the AA5 as it emerged from the sun just R of his 12 o'clock 150-200ft ahead slightly above and had reacted swiftly by pushing forward on the control column. He immediately lost sight of the AA5 as he went underneath but estimated it passed 50-100ft above. Meanwhile, the AA5, which had two pilots on board, was flying down sun but, having gone 'heads-in' whilst changing frequency, the handling pilot had only seen the PA28 on looking up; it was in his 10 o'clock range 400m crossing L to R and slightly below. He had immediately commenced a climbing R turn to avoid and had enough time to see the PA28 pitching down during its own avoiding action manoeuvre, passing <100ft below. Some members thought that, even though both parties took action, it had been effected too late to alter their respective flight paths to the extent that a collision risk existed. However, the majority of members believed otherwise and that the actions taken by both pilots had been effective in stopping the ac colliding. Nevertheless, the subject ac had passed in such close proximity that safety had been compromised to a significant extent during the encounter.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Very late sightings by both pilots.

Degree of Risk: B.
