


UK AIRPROX BOARD

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# Analysis of Airprox in UK Airspace

Report Number 20
January 2008 – June 2008

# Twentieth Report by the UK Airprox Board:

# ‘Analysis of Airprox in UK Airspace’

(January 2008 to June 2008)

produced jointly for

The Chairman,
Civil Aviation Authority

and the

Chief of the Air Staff,
Royal Air Force

## FOREWORD

The primary purpose of this, the twentieth Report from the UK Airprox Board (UKAB), is to promote air safety awareness and understanding of Airprox. “Book 20” covers the first six months of 2008 in detail, containing findings on the 87 Airprox that were reported as occurring within UK airspace in that period and which have been fully investigated and assessed by the UK Airprox Board.

The total of 87 Airprox for the first six months of 2008 is virtually equal to the average of comparable figures in each of the first half of the preceding five years: the Table below shows the details. It should be noted that whereas the number of Airprox in the first half of 2008 was in line with prior-year-average figures, the second half of the year was not. Preliminary data for 2008 as a whole indicate that figures for the year will be in line with those for 2006 and 2007: that is, of the order of 155~160 Airprox which compares favourably with a prior-five-year average of 178 Airprox.

As can be seen from the Table below, the number of Airprox by degree of Risk is substantially the same as it has been for the preceding two years except for the four ‘Risk D’ events.

| Risk Category | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|
| **A** | 6 | 8 | 13 | 4 | 3 | 5 |
| **B** | 29 | 30 | 26 | 20 | 21 | 21 |
| **C** | 49 | 66 | 53 | 54 | 51 | 57 |
| **D** | 1 | 5 | 0 | 0 | 0 | 4 |
| **Totals:** | 85 | 109 | 92 | 78 | 75 | 87 |

Although this half-yearly Report is primarily concerned with aircraft operations across the broad spectrum of aviation activities that occur in UK airspace, it is understandable that there is particular interest in those which involve commercial air transport (CAT) in risk bearing Airprox. None of the five Risk Category A events in the first half of 2008 involved a CAT aircraft. Within the 21 Risk Category B events, two involved at least one CAT aircraft, this figure being the same as in the first six months of 2007.

It is appropriate to acknowledge here those pilots and controllers who have conscientiously and openly reported events in which they have been intimately involved so that lessons may be identified from their Airprox experiences and safety action taken as appropriate. The (joint military~civil) Board and Secretariat strive to respect people’s understandable concerns by disidentifying reports, focussing on the essential facts of an incident with the aim of determining what actually occurred so as to arrive at fair, impartial conclusions of Cause and Risk.

To close on a personal note, my five-year term of office at UKAB ends in 2009, almost 51 years to the day since I first handled the controls of an aircraft, those of a glider at Christchurch Aerodrome, Hampshire. In handing over the reins to a successor, I very much wish to thank the air traffic controllers and pilots who have been involved in Airprox and have subsequently participated in the investigations; the Members of the UK Airprox Board; the Airprox Inspectors and UKAB’s administration team together with the many military and civilian specialists whose work contributes so much to the UK Airprox investigation system. I am absolutely certain that flight safety benefits from this collective effort.

**Peter Hunt**

Director, UK Airprox Board

**CONTENTS**

## INTRODUCTION

### UK AIRPROX BOARD (UKAB) COMPOSITION

The UKAB is an independent organisation sponsored jointly by the CAA and the MOD to deal with all Airprox reported within UK airspace. There are eight civilian and six military voting Members on the Board which is supported by specialist Advisers and chaired by the Director UKAB who reports directly to the Chairman CAA and Chief of the Air Staff, Royal Air Force. Board Members together form a team of hands-on practitioners with first-hand civil and military 'know how' on:

- Air Traffic Terminal Control, Area Control and Airfield Control, military and civil;
- Commercial Air Transport (CAT) flying, both fixed and rotary wing;
- General Aviation (GA) flying, including gliding; and
- Military flying, both fixed and rotary wing, by the RN, Army and the RAF.

### UKAB's ROLE

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

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

### STATUS OF UKAB REPORTS

The sole objective of the UK Airprox Board is to assess reported Airprox in the interests of enhancing flight safety. It is not the purpose of the Board to apportion blame or liability. To encourage an open and honest reporting environment, names of companies and individuals are not published in UKAB's reports.

### RISK CATEGORIES

Risk level assessments are made on the basis of what actually took place and not on what

| | | |
|---|---|---|
| **A** | **Risk of collision** | An actual risk of collision existed |
| **B** | **Safety not assured** | The safety of the aircraft was compromised |
| **C** | **No risk of collision** | No risk of collision existed |
| **D** | **Risk not determined** | Insufficient information was available to determine the risk involved, or inconclusive or conflicting evidence precluded such determination |

## AIRPROX DEFINITION

An Airprox is a situation in which, in the opinion of a pilot or controller, the distance between aircraft as well as their relative positions and speed was such that the safety of the aircraft involved was or may have been compromised.

## THE UKAB DATA SET

The UKAB Airprox database comprises a set of records each of which relates to a specific Airprox. As an investigation proceeds, from first report until the conclusion of the Board's deliberations, fields within the appropriate record are completed by the UKAB Secretariat. Analysis of the set of records is then possible to produce information such as is published in this Report.

## THIS REPORT

On pages 6 to 11, this Report follows established practice by giving a broad overview on general trends and then examines in more detail some specific results for each of the three principal airspace user groups, Commercial Air Transport (CAT); General Aviation (GA) and Military.

Some events, reported as Airprox and therefore assigned a reference number by the Secretariat, are subsequently withdrawn and are thus not subject to full investigation and assessment by the Board. Please note that only the reporter can withdraw an Airprox.

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

## PUBLICATION OF REPORTS

A key UKAB objective is to communicate effectively the lessons identified from Airprox events. Bi-annual 'hardcopy' Reports continue to be the primary means of communication, supported by presentations at flight safety meetings, cd-roms and the Internet. The UKAB Internet website is updated at least every month: for example, details of the most recent set of Reports assessed by the Board are, when finalised, 'uploaded'.

The UKAB website address is www.airproxboard.org.uk

## HALF-YEAR COMPARISONS 2007 AND 2008

A total of 87 Airprox were reported and opened for full investigation in the period 1 January to 30 June 2008. Tables 1 and 2 below give month-by-month data for the main three airspace user groups, the corresponding figures in the columns headed 'Totals' then being converted into percentages which are shown in pie-chart format in Figures 1 and 2. From these Figures, it can be seen that although the number of Airprox where civil aircraft met military aircraft (Civ~Mil) is unchanged (at 19), the increase in the overall total number of Airprox has resulted in the 'Civ~Mil' proportion being a few percentage points lower, year on year. Although the absolute number of Airprox in respect of military encounters with other military aircraft (Mil~Mil) has increased from nine to 10, the percentages remain the same, at 11%. In the category Civ~Civ, both the absolute numbers and the corresponding percentages have risen: 44 to 55, 59% to 64%. A more detailed analysis follows later in this Report.

| 2007 | Jan | Feb | Mar | Apr | May | Jun | Totals |
|---|---|---|---|---|---|---|---|
| Mil~Mil | 0 | 0 | 2 | 1 | 1 | 4 | 8 |
| Civ~Mil | 4 | 1 | 0 | 6 | 4 | 4 | 19 |
| Civ~Civ | 3 | 2 | 10 | 7 | 10 | 12 | 44 |
| Other | 0 | 1 | 1 | 0 | 1 | 1 | 4 |
| Totals | 7 | 4 | 13 | 14 | 16 | 21 | **75** |

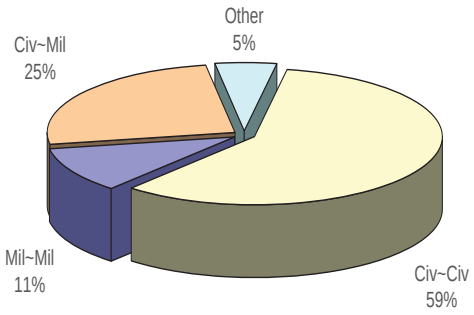
Table 1

| 2008 | Jan | Feb | Mar | Apr | May | Jun | Totals |
|---|---|---|---|---|---|---|---|
| Mil~Mil | 0 | 4 | 1 | 2 | 3 | 0 | 10 |
| Civ~Mil | 3 | 3 | 3 | 4 | 0 | 6 | 19 |
| Civ~Civ | 9 | 4 | 6 | 13 | 11 | 12 | 55 |
| Other | 0 | 0 | 0 | 0 | 2 | 1 | 3 |
| Totals | 12 | 11 | 10 | 19 | 16 | 19 | **87** |

Table 2

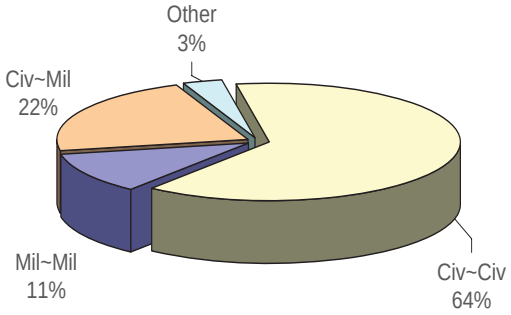
**User Group Mix: January - June 2007**

Figure 1




**User Group Mix: January - June 2008**

Figure 2




The totals in Tables 1 and 2 can additionally be 'broken out' as in Tables 3 and 4 below, these showing in more detail how the various user groups interacted with one another – the 'Mix' - during the first six months of 2008 (Table 4) with data for the same period in 2007 for comparison (Table 3). Setting aside the number of Airprox in which one of the aircraft is 'Unknown', it is instructive to look at two sub-totals, as follows. The total for 'Airprox involving at least one Mil aircraft' was 27 (i.e. 7 plus 12 plus 8) in Jan-Jun 2007; 29 (equals 6 plus 13 plus 10) in 2008, considered to be 'the same'. For those Airprox involving two civil aircraft, the total has risen from 44 to 55 but, as Tables 3 and 4 illustrate, this increase is spread uniformly across the three categories of CAT~CAT; CAT~GA and GA~GA. Again given the numbers of hours flown, it is considered that no one category stands out as warranting special attention.

| Mix details for 2007 (Jan-Jun): | |
|---|---|
| CAT~CAT | 12 |
| CAT~GA | 13 |
| GA~GA | 19 |
| CAT~Mil | 7 |
| GA~Mil | 12 |
| Mil~Mil | 8 |
| CAT~Unknown | 3 |
| GA~Unknown | 1 |
| Mil~Unknown | 0 |
| | **75** |

Table 3

| Mix details for 2008 (Jan-Jun): | |
|---|---|
| CAT~CAT | 15 |
| CAT~GA | 17 |
| GA~GA | 23 |
| CAT~Mil | 6 |
| GA~Mil | 13 |
| Mil~Mil | 10 |
| CAT~Unknown | 0 |
| GA~Unknown | 3 |
| Mil~Unknown | 0 |
| | **87** |

Table 4

## AIRSPACE IN WHICH THE CONFLICTIONS TOOK PLACE - JANUARY TO JUNE 2008

Figure 3 (below) shows the various classes of airspace within which the reporter's aircraft was situated when Airprox events occurred during the first six months of 2008. When comparing Jan-Jun 2008 with the same period in 2007, the number of incidents in Class G airspace, the 'Open FIR', in the altitude band from ground level to 3,000ft has changed little with a decrease of three to 22. The proportion of Airprox occurring in Class G airspace (considered as including LFA; ATZ; MATZ etc) is comparable with previous years, being 60% in 2008 as against 64% of the total in 2007.

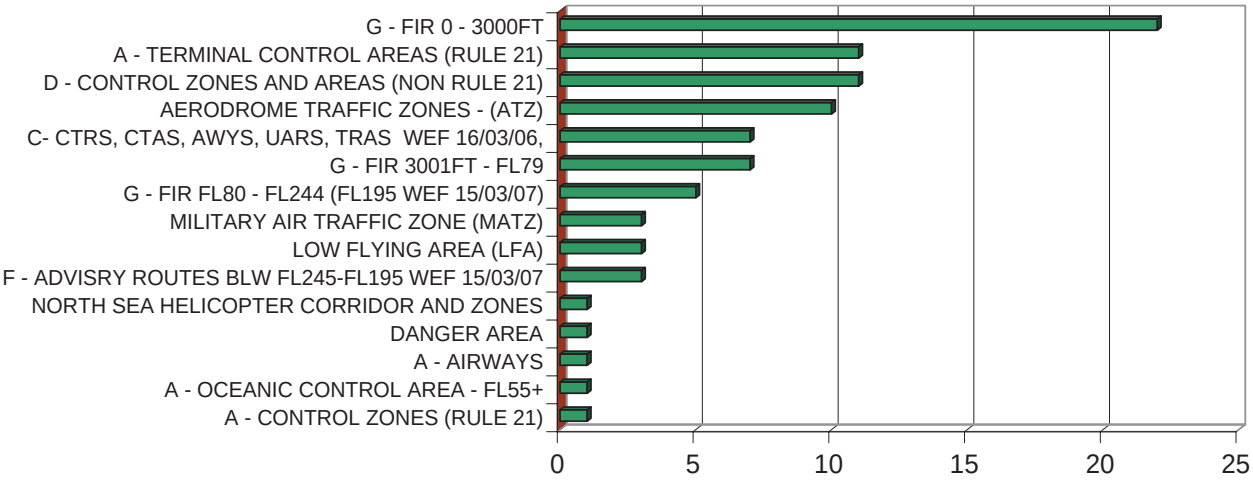



Figure 3

Two points are worthy of mention here. Firstly, the figure for Airprox events occurring inside Class A Terminal Control Areas increased from eight to 11, each of these Airprox involving two CAT aircraft. Whereas in 2007 one of the events was assessed as Risk B - the other six being Risk C - all 11 in Jan~Jun 2008 were Risk C, no risk of collision.

Secondly, the number of Airprox occurring within ATZs rose from seven to 10, half-year on half-year, the degrees of risk in 2007 numbering three Risk B and four Risk C. In the same period in 2008, the figures were one Risk A; four Risk B and five Risk C. The one Risk A event involved two GA aircraft. Just one - assessed as Risk C - of the 11 events in 2008 involved a CAT aircraft compared with three in 2007.

## COMMERCIAL AIR TRANSPORT (CAT) SECTION

**Risk results** Using the data in Tables 5 and 6 below, risk results for Airprox involving at least one CAT aircraft are plotted by month in Figures 4 and 5 overleaf. The overall number of Airprox where one of the aircraft involved was CAT has increased from a total of 35 to 38, once again less than half of the total number of Airprox in the first six months of each of the subject years. Continuing the trend of the previous two years, there were no Risk Category A encounters involving CAT aircraft in Jan~Jun 2008. Furthermore, of the 38 Airprox involving CAT in 2008, just two of the total were Risk Category B, the same number as in 2007. Thus, in each of the two subject half-year periods, less than 6% of those Airprox involving at least one CAT aircraft were assessed as risk bearing.

| 2007 | Jan | Feb | Mar | Apr | May | Jun | Totals |
|---|---|---|---|---|---|---|---|
| Risk A | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Risk B | 1 | 0 | 0 | 0 | 0 | 1 | 2 |
| Risk C | 4 | 4 | 7 | 6 | 7 | 5 | 33 |
| Risk D | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Totals | 5 | 4 | 7 | 6 | 7 | 6 | **35** |

Table 5

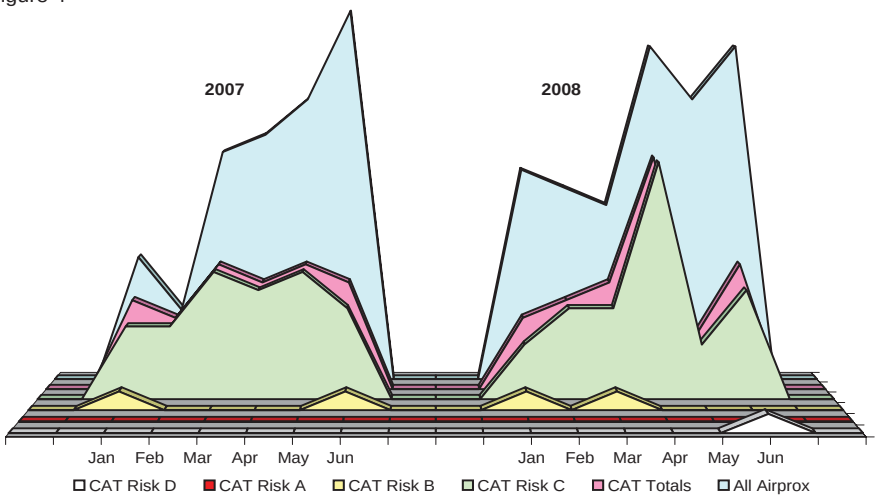
| 2008 | Jan | Feb | Mar | Apr | May | Jun | Totals |
|---|---|---|---|---|---|---|---|
| Risk A | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Risk B | 1 | 0 | 1 | 0 | 0 | 0 | 2 |
| Risk C | 3 | 5 | 5 | 13 | 3 | 6 | 35 |
| Risk D | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| Totals | 4 | 5 | 6 | 13 | 3 | 7 | **38** |

Table 6

**CAT Involvement in Airprox: January - June in 2007 and 2008**

Figure 4

Figure 5




Listed below in Table 7 are those seven **causal factors** of the 70 assigned overall (any one Airprox event can have more than one causal factor) which featured most prominently, on 37 occasions in the 38 Airprox involving at least one CAT aircraft. The number of times that 'Penetration of CAS/ATZ without clearance' was assigned reduced significantly from six to two. This is pleasing and it is hoped that such a level will be reduced still further in the future. Airprox where controllers 'did not separate or exercised poor judgement' remained the predominant factor associated with Airprox involving at least one CAT aircraft in the first half of 2008, featuring 16 times, an increase (from 11) over the same period in 2007. It should be noted however that of the (16) Airprox associated with this allocation in 2008, all bar one were assessed as Risk C.

| Ser. | Cause | Totals |
|---|---|---|
| 1 | DID NOT SEPARATE / POOR JUDGEMENT | 16 |
| 2 | CLIMBED / DESCENDED THROUGH ASSIGNED LEVEL | 4 |
| 3 | DID NOT ADHERE TO PRESCRIBED PROCEDURES (CONTROLLER) | 4 |
| 4 | INADEQUATE AVOIDING ACTION / FLEW TOO CLOSE | 4 |
| 5 | CONTROLLED AIRSPACE CONFLICT IN VMC | 3 |
| 6 | DID NOT ADHERE TO PRESCRIBED PROCEDURES (PILOT) | 3 |
| 7 | COLLAPSED-SECTOR WORKING (BANDBOXING) / HIGH WORKLOAD | 3 |

Table 7

As mentioned in the Foreword, it is understandable that there is general interest in Airprox involving CAT aircraft. There being no Risk Category A events during the first six months of 2008 in which at least one aircraft was CAT, attention naturally falls on the two Risk Category B Airprox. Airprox 001/08 occurred near Coventry in the London FIR - Class G airspace - between a CAT aircraft on a training flight and a privately-operated GA aeroplane. The Board assessed the Cause as a conflict in Class G airspace resolved by the CAT crew following their TCAS advice. In the second 'Risk B' event, Airprox 028/08, the Board judged that the (ATC) mentor did not ensure adequate spacing between IFR and VFR arrivals at Edinburgh. In essence then, there are no significant common features between these two Airprox which might indicate any trend.

## GENERAL AVIATION (GA) SECTION

**Risk results** for GA Airprox are given below: Tables 8 and 9 show the 'raw data' from which the charts in Figures 6 and 7 are constructed. As can be seen, the overall increase from 45 to 56 Airprox in which at least one aircraft was GA is spread across Risks B, C and D rather than being concentrated in one of those categories. The proportion of risk bearing events is down slightly, from 36% to 34%, continuing the earlier trend. Also of note is that GA risk bearing events now comprise about one third of the total of all GA Airprox rather than (say) the 54% of 2001. Airprox assessed as Risk D - 'Risk not Determined', insufficient information being available to determine the risk involved or inconclusive or conflicting evidence precluded such determination - reflected four cases where the 'reported aircraft' was untraced (3)/unidentified (1), notwithstanding the considerable efforts of all concerned.

| 2007 | Jan | Feb | Mar | Apr | May | Jun | Totals |
|---|---|---|---|---|---|---|---|
| Risk A | 0 | 0 | 1 | 0 | 0 | 1 | 2 |
| Risk B | 1 | 0 | 2 | 2 | 5 | 4 | 14 |
| Risk C | 1 | 2 | 3 | 9 | 5 | 9 | 29 |
| Risk D | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Totals | 2 | 2 | 6 | 11 | 10 | 14 | **45** |

Table 8

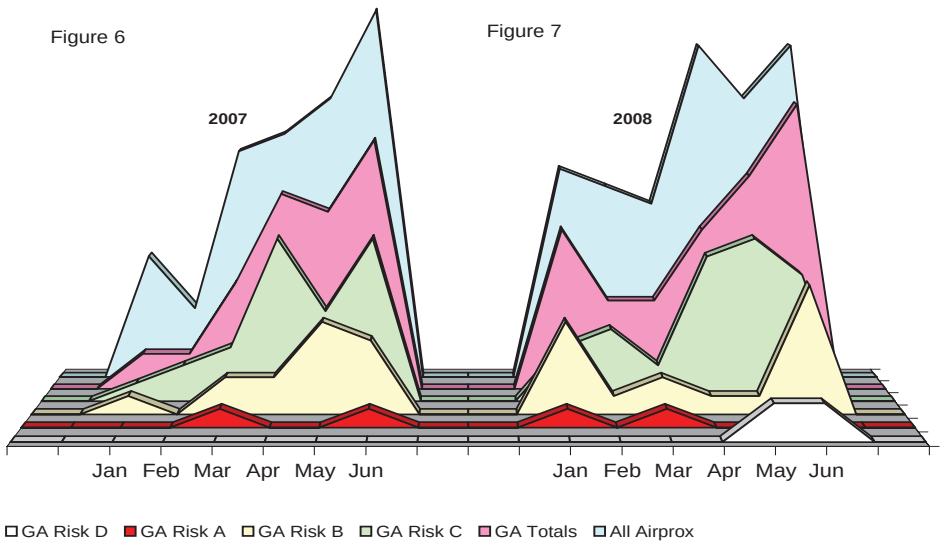
| 2008 | Jan | Feb | Mar | Apr | May | Jun | Totals |
|---|---|---|---|---|---|---|---|
| Risk A | 1 | 0 | 1 | 0 | 0 | 0 | 2 |
| Risk B | 5 | 1 | 2 | 1 | 1 | 7 | 17 |
| Risk C | 3 | 4 | 2 | 8 | 9 | 7 | 33 |
| Risk D | 0 | 0 | 0 | 0 | 2 | 2 | 4 |
| **Totals** | 9 | 5 | 5 | 9 | 12 | 16 | **56** |

Table 9

**GA Involvement in Airprox: January - June in 2007 and 2008**

Figure 6

Figure 7




In the 45 'GA' Airprox events in the first half of 2007, 30 different **causal factors** were assigned, virtually the same number as in the first half of 2008 when 31 different factors were assigned within the total of 56 Airprox. The six causal factors most frequently assigned in 2008 are shown in Table 10 (overleaf). The number of times that each of these six causal factors was assigned is also shown in the Table; the total - 52 - accounting for roughly half of the GA total. Sighting issues head the list, as in previous years: in this first half of 2008, on 29 occasions the pilot of one aircraft did not see the other aircraft at all or saw it late. As in previous issues of this Report, the importance of good lookout cannot be over emphasised, in particular for all who fly in 'see and avoid' airspace. The fifth factor, 'Penetration of CAS... without clearance' is again in the list which serves to remind pilots in particular of the importance of squawking with Mode C. The UKAB vigorously promulgates the associated safety messages arising from occurrences such as those highlighted here.

## GA Section (cont.)

| Ser. | Cause | Totals |
|---|---|---|
| 1 | LATE SIGHTING OF CONFLICTING TRAFFIC | 17 |
| 2 | DID NOT SEE CONFLICTING TRAFFIC | 12 |
| 3 | DID NOT ADHERE TO PRESCRIBED PROCEDURES (PILOT) | 7 |
| 4 | DID NOT SEPARATE / POOR JUDGEMENT | 6 |
| 5 | PENETRATION OF CAS/ATZ WITHOUT CLEARANCE | 6 |
| 6 | INADEQUATE AVOIDING ACTION / FLEW TOO CLOSE | 4 |

Table 10

## MILITARY SECTION

The total numbers of Airprox for the two periods Jan~Jun in 2007 and 2008 and in which at least one aircraft was military are shown respectively in Tables 11 and 12 with the associated **risk result** data plotted in Figures 8 and 9 below.

| 2007 | Jan | Feb | Mar | Apr | May | Jun | Totals |
|---|---|---|---|---|---|---|---|
| Risk A | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| Risk B | 1 | 0 | 2 | 1 | 3 | 2 | 9 |
| Risk C | 3 | 1 | 0 | 6 | 2 | 5 | 17 |
| Risk D | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Totals | 4 | 1 | 2 | 7 | 5 | 8 | **27** |

Table 11

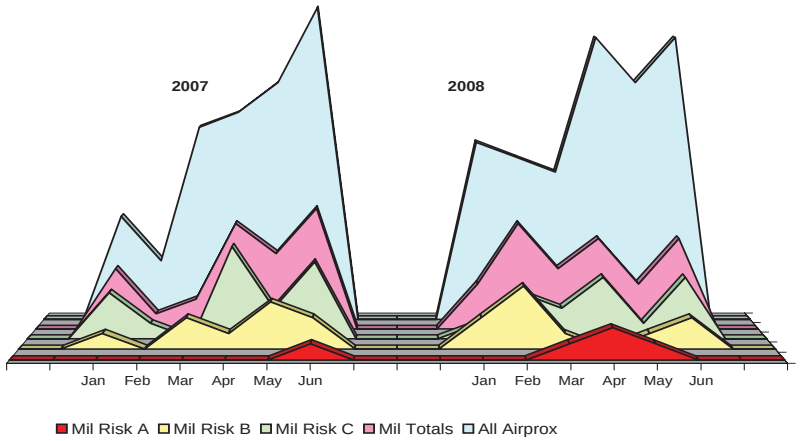
| 2008 | Jan | Feb | Mar | Apr | May | Jun | Totals |
|---|---|---|---|---|---|---|---|
| Risk A | 0 | 0 | 1 | 2 | 1 | 0 | 4 |
| Risk B | 2 | 4 | 1 | 0 | 1 | 2 | 10 |
| Risk C | 1 | 3 | 2 | 4 | 1 | 4 | 15 |
| Risk D | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Totals | 3 | 7 | 4 | 6 | 3 | 6 | **29** |

Table 12

The 'military' set comprised 27 Airprox in the first half of 2007, increasing by two to 29 in the same period for 2008. Of note is the increase - from one to four - in Risk Category A events. These numbers must be related to the average for such events over the period 2003~2007 inclusive which is a little over three Risk A Airprox in the Jan~Jun period. The first half of 2008 was therefore marginally above average. All four of the events in 2008 occurred in Class G 'see and avoid' airspace. Whilst no trends are evident from these incidents, each of the four events in Jan~Jun is of concern: it is understood that lessons identified have been/are being acted upon by the Military authorities.

**Military Involvement in Airprox: January - June in 2007 and 2008**

Figure 8 Figure 9



**MIL Section (cont.)**

As in earlier years, sighting issues continue to dominate the list of most-frequently assigned **causal factors** in 'military' Airprox. Table 13 shows the first eight factors out of a total of 27. The eight factors listed in the Table were assigned a total of 33 times, roughly half of the total number of assignments made. As regards 'learning points', the Table also shows that late or non-sighting of traffic was assigned 13 times - of note for pilots - whilst not separating and not giving inadequate avoiding action appear lower in the list, being of particular import for controllers.

| Ser. | Cause | Totals |
|---|---|---|
| 1 | LATE SIGHTING OF CONFLICTING TRAFFIC | 7 |
| 2 | DID NOT SEE CONFLICTING TRAFFIC | 6 |
| 3 | DID NOT SEPARATE / POOR JUDGEMENT | 5 |
| 4 | INADEQUATE AVOIDING ACTION / FLEW TOO CLOSE | 3 |
| 5 | DID NOT ADHERE TO PRESCRIBED PROCEDURES (PILOT) | 3 |
| 6 | DID NOT ADHERE TO PRESCRIBED PROCEDURES (CONTROLLER) | 3 |
| 7 | INADEQUATE AVOIDING ACTION / LACK OF POSITIVE CONTROL | 3 |
| 8 | PENETRATION OF CAS/ATZ WITHOUT CLEARANCE | 3 |

Table 13

## UKAB SAFETY RECOMMENDATIONS

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

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

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

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

**UPDATE DEC 2006**: The CAA is continuing to work towards development of a Low Powered Secondary Surveillance Radar Transponder (LPST), as covered in the published Regulatory Impact Assessment. A draft requirements document has been circulated to Industry and user groups and there are currently several companies in the UK that are in the process of developing a product.

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

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

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

**UPDATE DEC 2008:** Following the consultation in 2008, a Summary of Responses and a Synopsis of Comments Received were published on the CAA Website in December 2008. These outline the proposed way forward which was submitted to the CAA Board on 17 December 2008.

The proposed next steps, which are based on the consultation proposals, were agreed and the CAA will now progress the submission of the necessary legislative proposals to the Department for Transport during 2009.

The CAA has continued to promote transponder development and it is noted that there is some reaction within the industry to develop transponders appropriate to the lighter end of the market. As commercial interest continues to grow in response to the changing regulatory and market environment, it is likely that industry will succeed in developing products compliant with existing international standards.

**STATUS – ACCEPTED – CLOSED**

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

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

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

**UPDATE DEC 2008:** Exeter Airport commissioned Selex to undertake a full technical evaluation of the radar which revealed that some minor radar set-up parameters required adjustment. With these adjustments completed, a flight check was undertaken using a small helicopter. The flight check concluded that radar coverage was consistent with that expected and that all the technical anomalies had been addressed.

**STATUS – ACCEPTED – CLOSED**

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

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

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

**STATUS – ACCEPTED – OPEN**

## List of Abbreviations

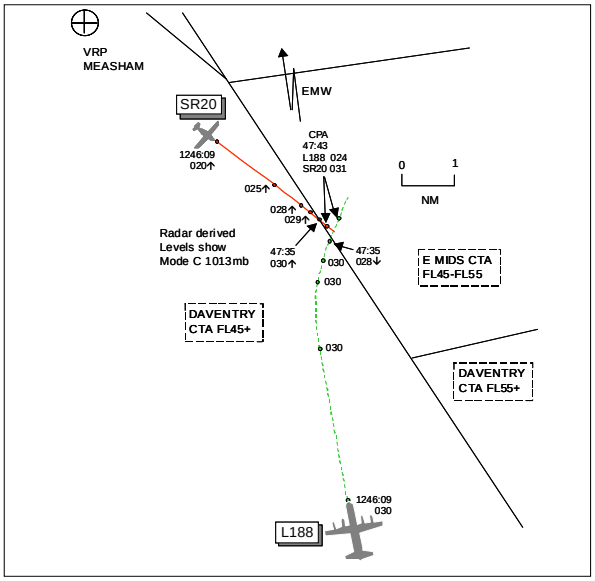
| | |
|---|---|
| aal | Above aerodrome level |
| ac | Aircraft |
| ACAS | Airborne Collision Avoidance System |
| ACC | Area Control Centre |
| ACN | Airspace Co-ordination Notice |
| A/D | Aerodrome |
| ADC | Aerodrome Control(ler) |
| ADF | Automatic Direction Finding Equipment |
| ADR | Advisory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

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

## AIRPROX REPORT No 001/08

## AIRPROX REPORT NO 001/08

| | | |
|---|---|---|
| *Date/Time:* | 2 Jan 1248 | |
| *Position:* | 5237N 00125W (15nm N Coventry - elev 267ft) | |
| *Airspace:* | LFIR | (Class: G) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | L188 Electra | Cirrus SR20 |
| *Operator:* | CAT | Civ Pte |
| *Alt/FL:* | 3000ft (QNH 1015mb) | ↑3000ft (QNH) |
| *Weather Visibility:* | IMC KLWD | IMC KLWD |
| *Reported Separation:* | 300ft V/<2nm H | 700ft V/NK H |
| *Recorded Separation:* | 700ft V/0·3nm H | |




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

**THE L188 ELECTRA PILOT** reports outbound from Coventry IFR on a training flight to Doncaster and in receipt of a RIS from Coventry Radar on 119·25MHz squawking 0260 with Mode S. After departure from RW05 the route flown was to the CT NDB followed by a L turn towards the EMW NDB cruising at 3000ft QNH 1015mb and 180kt. Conflicting traffic was reported by ATC on RT and it was seen on TCAS in their 11 o'clock range about 8nm, 1000ft below. At the time they were IMC in cloud. Further RT reports and TCAS observations of the traffic showed it on a converging course and climbing towards their altitude. They turned R 30° to avoid it but the traffic turned towards them and continued to close on their position. A TCAS TA was received quickly followed by an RA descend command which was actioned immediately. The other traffic passed 300ft above and <2nm clear, he thought, and once 'clear of conflict' was annunciated they returned to their assigned altitude. He assessed the risk as medium.

**THE CIRRUS SR20 PILOT** reports en route from IOM to North Weald IFR, a flight which he has made on a regular basis (6-8 flights in the previous 6 months). The ac is fitted with a PCAS system and the flight was fully planned with weather reports indicating that the icing layer was at about 3000ft with a strong E'ly wind. Initially flying at 2000ft towards WAL he was between cloud layers and was in communication with Liverpool Radar on 119·85MHz. It was clear that there was commercial traffic on the ILS approach to the E'ly RW and as a result he was radar vectored under a full IFR service through the Liverpool CTR. The routeing was N and E of the airport before he was cleared to resume a radar heading towards WHI. On leaving the CTR at 2000ft he tracked towards Old Warden but was still in cloud IFR so he elected to climb to 3000ft. By now he was listening out with London Information on 124·75Mhz squawking 7000 with Mode S about 15nm N of Coventry heading 110° at 150kt. It was either during the final stages of climb or when level that the PCAS gave a visual and aural warning of another ac. He monitored the separation, both in height and distance, and believed the other ac approached from the W, passing about 700-800ft below his ac but he was unable to estimate the horizontal separation that pertained. The other ac was not seen visually as he was in cloud but its height and distance was soon increasing so he maintained his heading and altitude. During this encounter the PCAS equipment was displaying 2 additional ac that were further away which were also being monitored. After this event he climbed to 3500ft and entered clear air, the cloud tops were 3200ft. The flight continued uneventfully with a descent after Old Warden to remain clear of Luton CAS before landing at North Weald. He assessed the risk as medium. He opined that ideally he would have liked a further radar service but his experience of getting this from EMA or Birmingham ATSUs had been very difficult and a LARS service was not always obtainable. It would have been helpful to be handed over to an ongoing radar service unit which he had experienced flying abroad but which was not always possible in the UK. He went on to comment about his difficulties since the summer of 2007 in obtaining a service from London Information unless crossing an FIR Boundary or joining CAS. The 'controller' is often managing both FIS frequencies which results in it being busy. Whereas previously he would have directly contacted London Information, he now only carries out a listening watch. He assumed that the other ac involved was a commercial departure from Coventry under

an instrument departure and wondered if it had radar cover which could have improved safety in this situation and avoided a TCAS alert. Further comment was made on the benefit of all ac carrying transponders and the fitting of budget TCAS systems, such as his PCAS unit, which would greatly help safety in light ac. Finally, he stated that he will persist in trying to obtain a radar service while in IFR conditions, either from a LARS unit or from a local ATSU, and will try to use London Information once again.

**THE COVENTRY APR** reports the L188 departed Coventry at 1243 and its details had been passed to East Midlands ATC, having been cleared from the CT to the EMW at altitude 3000ft. When the flight set course from the CT, TI was passed on an unknown ac just SE of Measham VRP. No specific height information was given although the pilot was advised that it was believed to be at 2000ft [Mode C SSR displayed on radar but not approved for use]. He then commenced a handover to East Midlands (EMA) ATC, informing the controller that the L188 was under a RIS and that TI had been passed on the unknown ac. EMA ATC told him that the unknown ac was seen to be climbing and this was passed to the L188 flight with an updated position. He agreed with EMA to keep the L188 until the 2 ac had passed whilst EMA told him that he could turn the L188 L if he wanted to. As the radar blips continued to converge, he asked the L188 crew if they wanted to avoid the unknown ac which they informed him they did. At the time the unknown traffic appeared to alter course to the S so, according to the Rules of the Air, he suggested a turn to the R of 30°. He did not consider that he had sufficient time to upgrade the service. The unknown ac's track then resumed a SE'ly track and TI was passed again *"12 o'clock range 0·5nm believed to be similar altitude"*. Seconds later the L188 crew called *"RA descent"* which he acknowledged and after an appropriate pause he informed the L188 flight when it was clear of the unknown. The L188 crew were asked if they wished to file an Airprox and they stated that they would do so on their return.

The Coventry METAR was EGBE 1220Z 12012KT 080V160 9999 FEW020 SCT025 04/01 Q1015= and 1250Z 12013KT 9999 BKN020 04/01 Q1015=

**ATSI** comments the L188 crew had filed a plan to route via the airways system from Coventry to Doncaster at FL90. Unfortunately, due to various difficulties, it was decided that the ac would route in the FIR via the EMW NDB at EMA to Doncaster. The Coventry APR coordinated with EMA and it was agreed that the ac would depart on track to the CT and then the EMW climbing to 3000ft. Further climb would be approved by EMA.

The L188 flight departed Coventry and contacted the APR who informed the crew that they were identified and instructed them to squawk 0260. (*ATSI note: Coventry ATC receive SSR from the Clee Hill radar source. They are seeking approval to use SSR however, this is not yet in place. In the meantime, the codes 0260 and 0261 are being allocated as conspicuity codes*). On being asked, the crew advised that they requested a RIS, which the APR provided. After a short while the APR transmitted *"(L188 c/s) there is traffic in your left eleven o'clock range of eleven miles southeast bound no height information but believed to be at altitude two thousand feet*", which was acknowledged. This traffic was not in contact with the Coventry APR and had not been coordinated with him. The APR telephoned EMA and passed a radar ident on the L188. It was agreed that the APR would transfer the ac once it had passed the opposite direction unknown, i.e. the subject SR20, which was not in contact with East Midlands. The EMA controller suggested to the APR *"... you could always jink him left if you want to"*. The radar shows that the SR20 was squawking 7000 with Mode C which, at the time, was indicating FL020 (approximately 2060ft QNH 1015mb).

The APR updated the TI *"(L188 c/s) that previously mentioned traffic now in your er half past eleven range of er three and a half miles he's climbing now through altitude two thousand five hundred feet"*. This was acknowledged and then the APR transmitted "*(L188 c/s) your present track, you'll go just to the right of that one if you want avoiding action I suggest a right turn heading zero three zero*". The crew responded by advising that they were turning R heading 030°. The APR then transmitted "*That opposite direction traffic is now believed to be at three thousand feet and it's turned back towards you twelve o'clock range half a mile*". The crew replied with "*(L188 c/s) TCAS descent*".

[Analysis of the radar recording at 1246:09 shows that the L188 tracking approximately 350° at FL030 (3060ft QNH) with traffic, the subject SR20, tracking 130° and climbing slowly from FL020 (2060ft QNH). At approximately the time the suggested R turn onto 030° was given, the SR20 was in the 11 o'clock of the L188 at a range of 1·5nm and 200ft below. The effect of the turn was to take the L188 across the front of the SR20. The radar recording, timed at 1247:35, shows the L188 having started to turn and descending through FL028 (2860ft QNH), in the 1 o'clock position of the SR20 at a range of 0·4 nm and 200ft below it. The next radar sweep, the CPA, displays the

L188, having crossed from R to L ahead of the SR20 and now in its 10 o'clock at a range of 0·3nm with the L188 indicating FL024 (2460ft QNH) and the SR20 FL031 (3160ft QNH).]

The APR complied with the terms of a RIS by passing and updating TI to the crew of the L188, however, the suggested R turn onto 030° took the L188 close to the SR20 and, with the benefit of hindsight, a L turn would have been more effective. If the L188 crew had not turned, or the APR had not suggested a heading to avoid the traffic, then it is assessed that the two ac would still have come into close proximity.

## PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Pilot Members noted the SR20 pilot's comments about difficulties in obtaining an ATS or LARS in the area where the Airprox occurred. Although mindful of his previous problems, the pilot might have tried contacting an ATSU adjacent to his track for a service particularly as he was flying in IMC. However, the SR20 pilot's chosen route in Class G after WHI had placed the ac to the E of Shawbury and W of Cottesmore LARS units and thereby outside LARS coverage. It was considered that the SR20 pilot, being cognisant of the enroute weather forecast, could have planned a slightly different route so that he passed through a LARS unit's area of responsibility and thereby obtained a radar service. As it was, he elected to fly under IFR in IMC without receiving a radar service within Class G airspace where the primary means of collision avoidance is through 'see and avoid'. He had seemingly placed great reliance in his PCAS system (effectively a 'sense and avoid' device). However, the GA Member opined that use of this equipment should really be looked upon as a 'last resort' method for collision avoidance after a sound lookout and an ATS.

The L188 crew, flying in cloud, had been told about the approaching SR20 by the Coventry APR and had monitored its progress on TCAS. Although only under a RIS, the L188 crew followed the APR's proffered avoidance turn onto 030°, as they could see from their TCAS that the SR20 had been climbing up slowly towards their cruising altitude. However, the subject ac continued to close; the L188 receiving a TCAS TA and then an RA 'descend' which was followed. The SR20 pilot had elected to climb to 3000ft and had been warned by his PCAS equipment of the approaching L188. The equipment indicated that the L188 had passed 700-800ft below his ac, however, he was unaware of how close the L188 passed laterally whilst the latter's crew manoeuvred robustly following the 'descend' RA and the avoidance turn. Neither the L188 crew, nor the solo SR20 pilot, saw each other's ac owing to the prevailing IMC, the radar recording revealing that the L188 moved rapidly across the SR20's 12 o'clock from R to L with the CPA measured at 0·3nm after the ac had crossed. Mindful of the close proximity, non-sightings by both crews, the late but robust manoeuvring taken by the L188 crew whilst the SR22 pilot climbed in cloud on instruments, the Board concluded that although this conflict in Class G airspace had been resolved by the L188 crew following TCAS, safety had indeed been compromised.

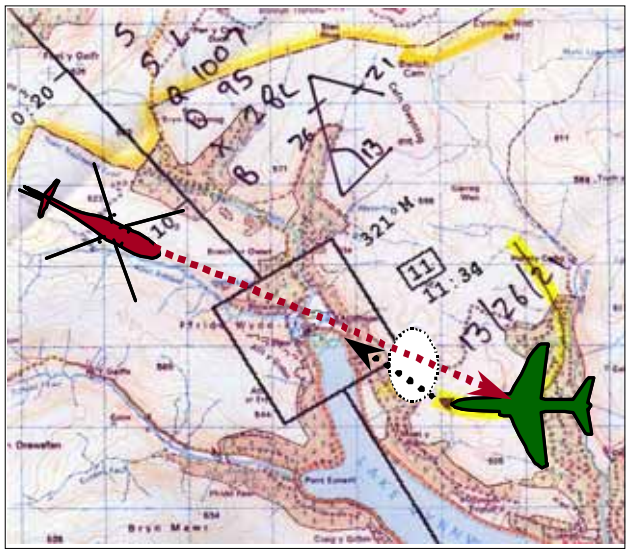
## PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A conflict in Class G airspace resolved by the L188 crew following TCAS.

Degree of Risk: B.

## AIRPROX REPORT NO 002/08

| | | |
|---|---|---|
| *Date/Time:* | 9 Jan 1406 | |
| *Position:* | 5247N 00331W | (5nm N Lake Bala) |
| *Airspace:* | UKDLFS/LON FIR | (Class: G) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | Hawk | A109 Helicopter |
| *Operator:* | HQ AIR (Trg) | Civ Comm |
| *Alt/FL:* | 800ft↓ | NR |
| | (N/K) | (N/K) |
| *Weather* | VMC | NR NR |
| *Visibility:* | Good | NR |
| *Reported Separation:* | | |
| | 100ft V/Nil H | NR |
| *Recorded Separation:* | | |
| | NR | |



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

**THE HAWK PILOT** reports flying a black ac with HISLs and nose light switched on, on a local singleton tactical low flying sortie with an instructor in the rear seat. They were flying in LFA7, from RAF Valley, squawking 7001 with Mode C, were not in contact with any unit but were listening out on the LFS frequency. They were under a medium workload while repositioning their ac for a second dive attack on a simulated target to the N of the Airprox location and were in a descending RH turn at 420kt towards the Initial Point which was the N end of Lake Vyrnwy. Half way round the turn, a belly check was conducted to clear the underside of the ac in the turn. The right hand turn was then continued to line the ac up with the track for the practice attack. As soon as the turn was recommenced, the rear seat pilot (instructor) saw a small blue helicopter with white rotor tips 500yd away in their 11 o'clock coming towards them, about 200ft below. He shouted "Pull Up". On this command a maximum performance climb was initiated and shortly after the instructor saw the helicopter pass about 100ft beneath them and slightly to the right of their ac.

They reported the incident to Valley APP on first contact. Due to their successful avoidance, they assessed the risk as being Medium.

**THE A109 HELICOPTER** was based in Ireland and despite its company being contacted on several occasions the pilot did not submit a report.

**HQ AIR (Trg)** comments that it is disappointing that the helicopter crew have not submitted a report to assist in determining of the cause of this Airprox. This appears to be a sighting issue that was resolved by the crew of the Hawk.

### PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included a report from the Hawk pilot and a report from its operating authority.

Members were disappointed that the A109 pilot did not provide a report as without it and in the absence of any radar recording there was little on which to base their deliberations. The Board had no reason whatsoever to doubt the Hawk pilot's report and accepted it as best information. It would seem that the A109 pilot had also been 'valley flying' and, since he was based overseas, some Members doubted that he had been fully aware of the extensive military low flying activity in Wales.

However, both ac had been flying legitimately in Class G airspace where the pilots were obliged to see and avoid other traffic. Largely due to the terrain, the Hawk crew's acquisition of the A109 - although late - had been as early as the circumstances permitted. Members agreed therefore that this incident had resulted from a conflict in the

FIR and that, due to the effective avoidance taken by the Hawk pilot as a result of the rear seat pilot's call, whilst safety had not been assured there had been no risk of collision.

A GA Member proposed that a copy of the final Report into this Airprox should be brought to the attention of the overseas Airprox agency so that lessons identified could be considered for publication locally to the benefit of pilots planning to operate at low level in UK airspace. This proposal was accepted and the Chairman undertook to write an appropriate letter.

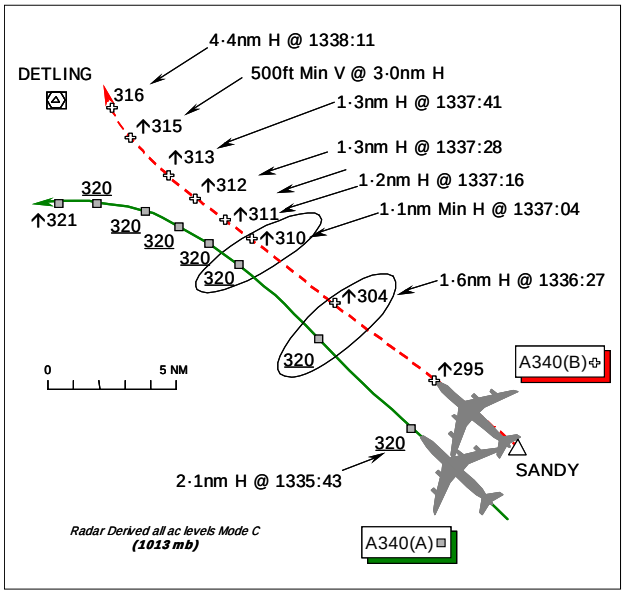
## PART C: ASSESSMENT OF CAUSE AND RISK

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

Degree of Risk: B.

## AIRPROX REPORT NO 003/08

| | | |
|---|---|---|
| *Date/Time:* | 10 Jan 1337 | |
| *Position:* | 5116N 00016E (10nm SE DET VOR) | |
| *Airspace:* | UAR UL613 | (Class: C) |
| *Reporter:* | LACC | |
| | *1st Ac* | *2nd Ac* |
| *Type:* | A340 | A340 |
| *Operator:* | CAT | CAT |
| *Alt/FL:* | FL320 | NR |
| *Weather* | IMC NR | NR |
| *Visibility:* | NR | NR |
| *Reported Separation:* | | |
| | 600ft V/1·9nm H | NR |
| *Recorded Separation:* | | |
| | 500ft Min V @ 3nm H | |
| | 1·1nm Min H @ 1000ft V | |




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

**THE LACC LONDON UPPER SECTOR 1&2 TACTICAL CONTROLLER (LUS TAC)** reports that A340(A) was northbound, routing DET-TLA at FL320. A340(B) was initially offered by S16 (DVR) S of RATUK and at the time was passing FL265, immediately beneath A340(A). Her PLANNER – LUS PLAN - rejected the ac, advising DVR that A340(B) would not be accepted unless the flight was "able FL340", due to traffic on the same route, immediately above - A340(A). The A340(B) was subsequently offered to them again by S26 – London Middle Sector (LMS) - and again rejected so the track "went background" [a less intense brightness of the TDB but still displayed]. She next became aware of A340(B) some 15nm S of DET as an "intruder" track, noticing the ac at the same time as her PLANNER, climbing through FL304, immediately below A340(A) that was maintaining FL320. Immediately, she turned A340(A) L by 15°, thinking that perhaps A340(B) had erroneously taken another ac's call to climb to FL310 which is the standard acceptance level onto LUS. When A340(B) was seen to pass FL311, she issued an avoiding action L turn onto 270° to the crew of A340(A) and passed traffic information. At no time did the crew of A340(A) indicate they had received a TCAS advisory. During this period, the LUS PLANNER confirmed that he had not "given any climb away on the A340(B)" and was trying to track down who was working the ac but it seemed to them at the time that the crew of A340(B) was not speaking with any sector. When A340(B)'s Mode C indicated it was continuing the climb through FL314, she climbed A340(A) to FL330 and again passed traffic information.

She believes that had the A340(B) been a more efficient ac type, the incident would have been much more serious, as the climb rate would have been higher. If Mode S data had been available it would have given her a much earlier indication of A340(B)'s selected flight level (SFL) and therefore she would have given the avoiding action as her first call to A340(A).

**THE LACC LONDON UPPER SECTOR 1&2 PLANNER (LUS PLAN)** reports that at approximately 1335 he rejected an offer from DVR on A340(B) in the VESAN area [over France]. Approximately 2min later he rejected the same ac offered by LMS. Soon after he noticed the A340(B) S of DET passing FL304 and pointed this out to LUS TAC. He asked LMS to what level they were climbing the A340(B) but they said they did not have the flight so he called DVR and they said they did not have the ac either. During this call he observed the A340(B) passing FL311 climbing in direct confliction with the A340(A) that was same direction traffic maintaining FL320. He hung up and immediately made his TACTICAL controller aware of this. Avoiding action was given but he believes that the A340(B) reached FL316. Subsequently, he observed the A340(B) begin to descend and turn away hard R and was advised that A340(B) was on DVR S16's frequency.

**THE LACC DOVER SECTOR 15/16/17 TACTICAL CONTROLLER (DVR TAC)** reports he took over as the combined S15-17 DVR TAC at the commencement of the shift at 1330 [some 7min before the CPA occurred]. As

part of the position hand-over he was made aware that the A340(B) had been transferred to LMS S26 but no acknowledgement of the frequency change had been received from the A340(B) pilot.

The combined Sector traffic levels were average for this time of day, his main concern at the time being the late acceptance of traffic by the Local Area Group (LAG) of several transatlantic departures from Paris.

He was alerted by his PLANNER that A340(B) was climbing without being in contact with either LMS or LUS and asked to check that the flight was not still on his frequency. Initial calls to A340(B) brought no response. As vertical separation between A340(B) and A340(A) reduced below 1000ft, the crew of A340(B) called him whereupon he immediately issued avoiding action including a turn and descent. Unfortunately there was no response to this avoiding action instruction and it was not until several transmissions later that the crew of A340(B) actually responded to instructions during which separation between the two ac deteriorated further.

Once standard separation was regained, A340(B) was re-coordinated with LMS at FL300 and transferred to 132·6MHz. His attention then returned to the Paris TMA departures that were still awaiting a response from LAG.

**THE LACC DOVER SECTOR PLANNER (DVR PLANNER S15/16/17)** reports he took over the position as mentor to a trainee just as the A340(B) had been rejected by LUS. It was then offered to LMS and accepted at FL280. The ac was then instructed to switch to LMS TAC on 132.6MHz. The A340(B) crew did not respond and this was handed over to the oncoming DVR TAC controller whilst they were busy trying to co-ordinate the next "bunch" of Paris outbounds with LUS. The first of these was rejected by LUS but they suggested verbally that they would accept the traffic behind it. These were then offered to LUS. After some time these were still not accepted by LUS and they were asked by their DVR TAC to chase it up, who then said to offer them to LMS at FL280.

LMS phoned and asked what they were doing with the A340(B) but he responded that it was not on their frequency and he asked DVR TAC to check this. LUS also phoned with the same inquiry as they had the A340(A) directly above. DVR TAC attempted to contact the A340(B) a few times and after some time the crew replied whence avoiding action was given.

He asked for a 'secondary' controller to plug in with the TAC who said he wanted the Sector split which was promptly done.

Following the avoiding action, the A340(B) was re-coordinated with LMS at FL300 on track to HALIF. DVR TAC routed the ac to HALIF and instructed the crew to contact LMS TAC on 132.6MHz. The A340(B) read back the frequency but the wrong position, which was corrected by the TAC. A few minutes later, LMS phoned to say that they still did not have the A340(B) on frequency. The oncoming tactical controller checked and instructed the crew of A340(B) to transfer to 132·6MHz again.

**THE LACC LONDON MIDDLE SECTOR 25/26 TACTICAL CONTROLLER (LMS TAC)** reports his attention was drawn to the two ac when STCA activated. Although he was expecting A340(B) to appear on his frequency, he had not given it any thought as he was busy elsewhere in his Sector. He noticed that A340(B) was apparently climbing, through about FL300 as he recalls, which he noted as odd since he was expecting the ac at FL280. His initial thought was that the ac had been re-co-ordinated into LUS airspace and he looked across at his PLANNER's screen to see that this was not the case. There was a certain amount of confusion at this time as none of the sectors were aware of what was happening. He became aware that LUS TAC had noticed the potential conflict with A340(A) and had started to take action. His PLANNER was also communicating with DVR S16 so there was nothing for him to do other than try to raise the A340(B) crew on his frequency, which was unsuccessful. A340(B) was eventually transferred to his frequency a few minutes later, after the conflict had been resolved.

**THE LACC LONDON MIDDLE SECTOR 25/26 PLANNER (LMS PLAN)** reports that the A340(B) was offered into the Sector at FL280 that was accepted. He then noticed it passing about FL304 and called DVR S16 to ask what was happening but they did not know. At the same time he saw that directly above the A340(B) was A340(A), level at FL320, and heard LUS instructing the flight to turn. He tried calling DVR S16 several times to see if they had any luck with raising the A340(B) but they said they were not in contact with it and did not know what it was doing. They, on LMS, never spoke to the crew of the A340(B) until LAM where it called them at FL300.

He opined that Mode S would have helped prevent this incident as they would have been able to see what level the A340(B) was going to, even when it was not speaking to anyone, rather than wait to see if it went through FL310.

**LACC LOCAL AREA SUPERVISOR SOUTH (LAS)** reports that his attention was drawn to the DVR PLAN Mentor on Sector 16 shouting across the Ops room, "we are not working it". He immediately looked at his radar to see STCA activated between the subject ac.

He went over to the DVR Sector which was operating with Sectors 15, 16 and 17 in a 'band-boxed' configuration with medium traffic levels. At this point, DVR TAC was issuing avoiding action and he observed separation between the aircraft was 500ft and 2nm.

He immediately asked an adjacent controller to plug in but the DVR TAC requested that Sector 17 be split-off. A further three controllers were called back to split the Sector and remove the incumbent team as soon as was practicable.

**THE PILOT OF A340(A)** reports that he was in transit from Zurich to Los Angeles and in receipt of a RCS from London CONTROL. Established in a level cruise at FL320 in IMC, flying at 450kt, the crew was made aware of a possible conflict in traffic separation and instructed to turn onto a heading of 270°. Several other flights were on the same frequency and also displayed on TCAS so the actual conflicting ac could not be ascertained. He complied with the avoiding action heading given by the controller and a TCAS TA of "TRAFFIC" was "noted" but the crew experienced "no serious threat at any time". Minimum separation was reported as 600ft vertically and 1·9nm horizontally and the risk assessed as *"low".* Shortly thereafter they were cleared to proceed on track in accordance with their flight-planned route.

**THE COMPANY OF A340(B)** was contacted on several occasions by the UKAB Secretariat and requested to contribute to the investigation but to date no response has been given and no pilot's report received.

**ATSI** reports with RT transcript that the crew of A340(A) established contact with LUS TAC at 1325:20, maintaining FL320 and was instructed to route VESAN – DETLING – HALIF on UL613. The crew of A340(B) contacted DVR TAC at 1327:50 and reported climbing to FL260. At the time, the radar recording shows A340(B) to be passing FL230 some 7·2nm away. DVR TAC asked the crew of A340(B) what was their requested level, [when this question was repeated] they advised FL320. At 1328:20, the crew of A320(B) was instructed to *"..climb flight level 2-8-0"* and this was correctly read back – *"climbing 2-8-0* [A340(B) C/S]. This was the level that DVR PLAN had offered it to the next sector - LMS - and at which the flight had been accepted into LMS.

At 1333:00, DVR TAC instructed the crew of A340(B) to contact LMS TAC, "[A340(B) C/S] *contact LONDON one three two six bye"*. This transmission crossed with that of another flight and so the frequency change for A340(B) was repeated but there was no response from the crew. The transmission was made for the third time but again there was no response. At this time A340(B) was in the 2 o'clock of A340(A), range 2nm, with A340(A) maintaining FL320 and A340(B) passing FL275. Analysis of the Mode S data shows that some 10sec later, the Selected Flight Level (SFL) for A340(B) was changed to FL320. (ATSI note: this information would not have been available to the DVR TACTICAL controller).

At 1334:30, a change of controller took place on the DVR TAC position. The oncoming controller reported that, as part of the handover, he was advised that the crew of A340(B) had not read back the frequency change instruction.

LUS TAC noted that A340(B) was climbing through FL304 whilst A340(A), which she was working, was in close proximity at FL320. Accordingly, LUS TAC instructed the crew of A340(A) to "*…turn left 15º*". She then, at 1336:45, attempted to call the crew of A340(B) but there was no response and so she tried again but without success. Immediately afterwards, at 1337:15, she issued an avoiding action turn onto 270º to the crew of A340(A) and passed traffic information on A340(B), "[C/S] *avoiding action turn left immediately heading 2-7-0 degrees there is traffic..2 miles in your right hand side supposed to be climbing to your level"*.

Meanwhile, telephone calls were being made between LUS, LMS and DVR to try and establish who was in contact with A340(B) and ascertain to what level it was climbing. At the same time as LUS TAC was passing avoiding action to A340(A), DVR TAC called the crew of A340(B) to see if it was still on his frequency. When DVR TAC

made the first call at 1337:20, A340(B) was in the 2 o'clock position of A340(A), range 1·2nm some 900ft below it. There was no reply to the first call but, when a second was made, the crew of A340(B) responded. DVR TAC transmitted at 1337:30, "[A340(B) C/S] *avoiding action turn right heading north..descend now flight level 3 Hundred*". Unfortunately, two other aircraft made their initial calls on the frequency immediately after the avoiding action transmission was passed and this prevented both the crew of A340(B) and the controller from communicating with one another. DVR TAC called the crew again just after 1337:40, to which they replied: "*..heading north..and..climbing flight level 3-2-0*". The controller replied by telling them that they were not cleared to FL320 and must descend now to FL300, which the crew acknowledged. When the avoiding action instruction was being passed to the crew of A340(B) the two ac were 1·3nm and 800ft apart. The turn instruction previously given to A340(A) by LUS TAC started to take effect and the horizontal separation increased slowly. However, A340(B) did climb to a maximum of FL316, i.e. 500ft below A340(A), before commencing a descent.

Analysis of the RTF showed that the original off-going S17 DVR TACTICAL controller was speaking very quickly on the RTF and some instructions had to be repeated. In the 7min period when A340(B) was on frequency, a total of 7 frequency change instructions were given. However, none contained the word 'decimal', as is required when passing a frequency change, but were simply the frequency digits. Of the three transmissions that the controller made to instruct the crew of A340(B) to change frequency, only the last at 1333:10, was in the correct format of "[A340(B) C/S] *contact LONDON one three two decimal six bye*". Given that this frequency contains the digits three and two, which were the same as the requested level of A340(B), it is possible that the crew mistook this frequency change for a level change. This hypothesis is supported by the fact that there were no other transmissions at the time involving this level and at about 1333:20 - some 10sec after the instruction was passed - the crew of A340(B) changed their selected flight level from 280 to 320 [as evinced by recorded Mode S data].

Additionally, the unit's MATS Part 2 (DVR 2.4, para 2.4.2.9) states that all traffic operating at or above FL260 transferred from DVR to LMS is released for climb to FL300. It is possible that one or both of the DVR TACTICAL controllers, thought that although the crew of A340(B) had not read back the frequency, they had in fact received the instruction and were now in contact with LMS who were continuing A340(B)'s climb as they were entitled to do.

## PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included a report solely from the pilot of A340(A), transcripts of the relevant RT frequencies, radar video recordings, reports from the air traffic controllers involved and a report from the appropriate ATC authority.

It was unfortunate that the company of A340(B) had not responded to requests from the UKAB for a report from their pilot. The Board was briefed by the ATSI Advisor that a report from NATS into the Airprox had contained a comment that:

The Captain of A340(B) confirmed by telephone that he thought he had not received a modification of the ATC clearance climbing to FL320 and that the frequency change onto 132·6Mhz was not noticed by the crew. No TCAS resolution had appeared and no avoiding action was initiated. Furthermore, an investigation had also been initiated to inventory all headset technical defects for flight crew occurring within the past 6 months.

Thus it seemed that the crew of A340(B) had not appreciated that a climb to their initially requested level of FL320 was not approved. However, the ATSI report coupled with the RT transcript of the Sector frequencies had made it plain that at 1328:20 the crew of A340(B) had been clearly instructed by DVR TAC to climb only to FL280. This instruction was immediately and unmistakably read back by the crew of A340(B), just before 1328:30, with no indication of any other interference on the frequency that might have affected their understanding at that point. This was the only level instruction issued to this crew before the Airprox and the Board recognised that any mistake over the assigned level was clearly on the flight deck of A340(B) after the readback had been given. Members discounted any suggestion that headset unserviceability had played a part in this 'level bust'. Whilst difficulties with A340(B)'s RT or audio equipment on the flight deck might subsequently have effected the reception of the frequency change instructions, Members were convinced that it was not contributory to the basic misunderstanding of their assigned level at the time of readback. However, although clarity of the transmission was not a factor in the level instruction passed by the DVR TAC controller, the ATSI report had pointed out that the frequency change instruction transmitted exactly 5min later onto the new frequency of 132·6MHz, included the numerals 3 and 2 as did the level requested by the crew of A340(B). Some 10sec after the frequency change transmission was made, the crew of A340(B) adjusted their selected flight level from 280 to 320, the instruction to

change frequency remaining unanswered. Members recognised that, although unfortunately not yet available to the Sector controllers here, the recorded downlinked Mode S data from A340(B) had shown that the crew had set the selected level erroneously to FL320, strongly suggesting a misunderstanding of this second transmission to them, albeit that in the high RT traffic loading that pertained there was no readback of this instruction identifiable on the RT transcript at all. This lack of acknowledgement of the frequency change had been apparent to the off-going DVR TAC controller who had forewarned his colleague. When it subsequently became evident that the crew of A340(B) had climbed above the assigned level of FL280, the controller took action promptly but the ATSI report had shown that it took some time to contact the crew once more. Here then was potential evidence of RT/audio problems in A340(B) but fortunately LUS TAC had spotted that the flight was exceeding its assigned level and promptly issued avoiding action to the crew of A340(A) to remain clear. As it was the crew of A340(A) had no influence on the cause of this Airprox and little effect on the outcome apart from responding promptly to LUS TAC's timely intervention, which prevented the situation from deteriorating further. The radar recording showed that the acs' tracks got no closer than 1·1nm and at that point 1000ft of vertical separation existed. It was not surprising to Members that no RA was enunciated and in all probability the TA reported by the pilot of A340(A) occurred when separation had reduced to a minimum of 500ft vertically – but at a range of 3nm.

Taking all these various factors into account, the Members concluded unanimously that this Airprox had been caused when the crew of A340(B) climbed above their assigned and acknowledged level into conflict with A340(A). The Board also agreed that due to the prompt intervention of the controllers involved, no risk of a collision had existed in the circumstances reported here.

## PART C: ASSESSMENT OF CAUSE AND RISK

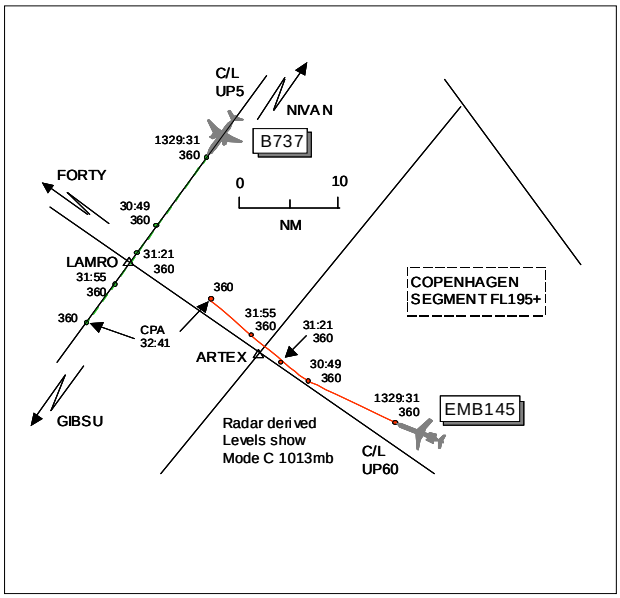
Cause: The crew of A340(B) climbed above their assigned and acknowledged level into conflict with A340(A).

Degree of Risk: C.

## AIRPROX REPORT No 004/08

## AIRPROX REPORT NO 004/08

| | | |
|---|---|---|
| *Date/Time:* | 11 Jan 1333 | |
| *Position:* | 5658N 00337E (180nm E Aberdeen) | |
| *Airspace:* | UAR UP5/UP60 (Class: C) | |
| *Reporter:* | ScACC MORAY P&T | |
| | *1st Ac* | *2nd Ac* |
| *Type:* | B737-300 | EMB145 |
| *Operator:* | CAT | CAT |
| *Alt/FL:* | FL360 | FL360 |
| *Weather* | NK NR | VMC NR |
| *Visibility:* | NR | >10km |
| *Reported Separation:* | | |
| | Not seen | NR |
| *Recorded Separation:* | | |
| | Nil V/12·2nm H | |




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

**THE SCACC MORAY PLANNER & TACTICAL** reports monitoring a "Stage 2" trainee and that there was a lot of moderate turbulence around the sector between FL240-FL360. They received an estimate on the B737 routeing NIVUN to GIBSU at FL360 and about 5min later an estimate was received on the EMB145 at FL200 routeing from LAMRO to FORTY for landing at Aberdeen. There was no reason to believe that FL200 was incorrect as it was thought to be because of the extensive turbulence. The B737 flight called on frequency, was identified and was given its routeing. As the B737 was approaching LAMRO the EMB145 flight called on frequency, but was not in radar cover, reporting at FL360. The trainee was a bit taken aback as he was not expecting any traffic at FL360 so he asked for confirmation of the c/s of the ac that had just called. The EMB145 flight called again and confirmed at FL360. At the same time the Copenhagen telephone rang: on answering, the Copenhagen controller asked if they had 2-way contact with the EMB145 flight and requested confirmation on the FL that they had. The trainee confirmed that 2-way contact was established and that FL200 had been passed but the flight reported at FL360. He, the mentor, took control and asked the Copenhagen controller where the EMB145 was in relation to his B737 approaching LAMRO at the same level, as there was still no radar contact on the EMB145, and did he need to turn the EMB145. The Copenhagen controller advised him to turn the EMB145 R 10° which they did. A few minutes later the EMB145 appeared on radar, was identified and was seen to pass about 10nm behind the B737. Once the EMB145 had passed through the B737's 6 o'clock, the B737 flight was transferred to Tyne Sector and the EMB145 flight was put on its own navigation to FORTY.

**THE B737 PILOT** reports that the crew were not aware of any loss of separation or degradation of safety margins owing to the proximity of other traffic either by ATC or TCAS.

**THE EMB145 PILOT** reports at M0.76 and FL360 and in receipt of a RCS from Scottish on 129·225MHz squawking with Mode C. On checking-in with Scottish near to ARTEX they were asked to confirm their level (FL360) and they were given a radar heading 300°. Other traffic was noted on TCAS at the same level [no horizontal separation stated]. No TA or RA was received.

**ATSI** reports that at the time of the Airprox both the B737 and EMB145 flights were in communication with the ScACC Moray controller. The sector was being operated by a mentor and trainee who were performing the duties of both the Tactical and Planner. An estimate was passed from Stavanger indicating that the B737 was maintaining FL360 and routeing NIVUN – LAMRO – GIBSU – NEW following UP5 and UP16. The estimate passed for LAMRO was 1334. The data passed by Copenhagen in respect of the EMB145 was that it was maintaining FL200 and routeing ARTEX - LAMRO – FORTY – ADN along UP60 and estimating LAMRO also at 1334.

Although the flight level passed on the EMB145 was somewhat unusual, the controllers were not overly surprised as turbulence had been reported between FL240 and FL360 that day. Scottish control radar coverage in the vicinity of LAMRO is normally provided by a choice of the Sumburgh (SSR only), Aberdeen or Great Dunfell radars. On this occasion the Moray mentor and trainee were making use of the Sumburgh and Aberdeen radars to provide coverage for the whole of their sector. Normally, the Great Dunfell and Aberdeen radars would have been selected on the 2 available displays to cover the area around LAMRO but the Great Dunfell was out of service. The coverage available to Scottish is such that solid cover cannot be assured either in the vicinity or E of ARTEX so reliance is placed on Copenhagen's coverage in this area.

At 1323:30, the crew of the B737 called and reported at FL360. The trainee instructed them to squawk and he would report when he had radar contact. At 1328:15, the flight was identified, placed under a RCS and instructed to route direct to CUTEL. At 1329:30, the EMB145 crew called and advised they were maintaining FL360 and routeing to ARTEX. The trainee issued a squawk and asked them to confirm their level, which they did as FL360. At this point the EMB145 was inside the Scottish area of responsibility (but in the portion of airspace which is delegated to Copenhagen at or above FL195) but not in radar cover nor expected to enter it for a number of minutes. At 1330:00, Copenhagen called Scottish and a brief discussion took place regarding whether contact had been made with the EMB145 and about the ac's level. It was clear from the conversation that the Copenhagen controller realised there was a possibility of an incorrect level having been passed and it was established that the EMB145 was at FL360 and not FL200 as passed. The Copenhagen controller apologised and stated that they were having some problems with their system. (ATSI Note: The B737 was transferred from Stavanger direct to Scottish control and so Copenhagen would have no knowledge of it, given that it would not be entering their airspace.)

[UKAB Note (1): Transfer of Control is at ARTEX and Transfer of Communications is at or before ARTEX.]

The mentor then took over the phone conversation and asked for the relative position of the EMB145 with respect to the B737 and the Copenhagen controller advised that the EMB145 should be turned R 10°. The trainee told the crew to turn R 15° and that the B737 crew should continue on their present heading. At this time only the B737 was visible on radar and it was not until 1331:55 that an intermittent return from the EMB145 appeared.

From radar pictures supplied by Copenhagen the EMB145 can be seen tracking NW whilst the B737 is heading SW. The EMB145 passed behind the B737 and the minimum separation between the ac at 1332:41 was 12·2nm at the same level. The required separation was 10min.

Copenhagen was unable to determine the exact sequence of events due to a technical fault. However, they were able to establish from voice recordings that the EMB145 had been cleared to FL200 initially and then given further climb as the flight progressed. It is clear that no level revision was passed to Scottish but it has not been ascertained whether the Copenhagen controller did not do this or the automated system failed to on the controller's behalf.

## 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 and video recordings, reports from the air traffic controllers involved and reports from the appropriate ATC authorities.

The NATS Advisor informed Members that a review is underway in collaboration with Stavanger and Copenhagen ACCs for the establishment of a Flight Level Allocation System over the North Sea to ensure procedural separation in the area of poor Scottish radar coverage. Also, there is currently a Moray Sector safety survey in progress, with both due for completion by November 2008.

Members understood the Moray controller's concerns with this Airprox as both ac were allowed to be under his control in an area with poor radar and RT coverage. In this case, ScACC were not given the EMB145's correct FL on the On-Line Data Interchange from Copenhagen so the ScACC Moray controller was oblivious to the confliction until the flight called on frequency and the crew informed him of its correct FL. This occurred before the flight had reached the transfer of control point ARTEX, in Moray's area of responsibility, leaving the controller little time to resolve the confliction. As a consequence of this 'new' level of FL360 being revealed, procedural separation was lost. Almost immediately thereafter, the Copenhagen controller had called the Moray controller,

apparently aware that the EMB145's level information previously sent might be incorrect, and apologised for passing the inaccurate data. Members were clear that the incorrect FL being passed, when ScACC were operating in a procedural environment, had resulted in the EMB145 flying into conflict with the B737 and this had caused the Airprox.

With the EMB145 flight reporting at FL360 and with ETAs for both flights at LAMRO identical, a serious loss of procedural separation had occurred. The EMB145 was not visible to the Moray controller but he could see the B737 flying SW bound along UAR UP5 through LAMRO [16nm NW of ARTEX]. Moray had elicited position information on the EMB145 relative to the B737 from the Copenhagen controller who, with good radar coverage, was able to offer a radar-derived solution to the situation. The Moray controller had turned the EMB145 R 15° and locked the B737 on a radar heading which had resulted in the subject ac passing with more than the required 10nm lateral separation that the Moray controller would have needed to apply had both ac been identified and displayed on his radar display system. The EMB145 appeared on the Moray's display just after passing ARTEX, before the CPA, but by now the situation had been resolved by the good TRM shown by the Moray and Copenhagen controllers. Although this had had the potential for being a serious incident, the Board agreed that the actions taken by all parties had quickly and effectively removed any risk of collision.

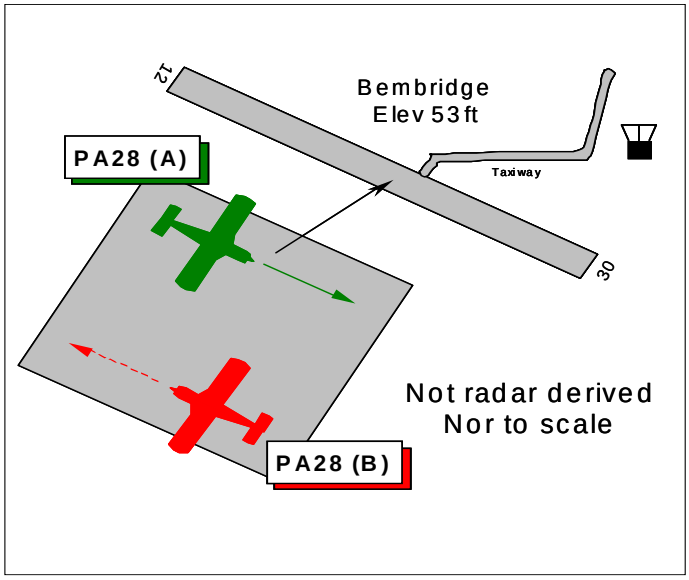
## PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Copenhagen ACC passed an incorrect FL to ScACC and, in a procedural environment, the EMB145 flew into conflict with the B737.

Degree of Risk: C.

## AIRPROX REPORT NO 005/08

| | | |
|---|---|---|
| *Date/Time:* | 12 Jan 1217 (Saturday) | |
| *Position:* | 5041N 00107W (Bembridge A/D - elev 53ft) | |
| *Airspace:* | Bembridge ATZ | (Class: G) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | PA28 Cadet | PA28-180 |
| *Operator:* | Civ Pte | Civ Gp |
| *Alt/FL:* | 0ft | 0ft |
| | aal | aal |
| *Weather* | VMC NR | VMC NR |
| *Visibility:* | 10km | 10km+ |
| *Reported Separation:* | | |
| | Nil V/8m H | Nil V/10m H est |
| *Recorded Separation:* | | |
| | Not recorded | |




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

**THE PIPER PA28 CADET PILOT [PA28 (A)]** reports that he was inbound to Bembridge from Fairoaks in his blue coloured ac. The HISLs were on. Subsequent to executing a go-around and after being advised of the RW conditions whilst on FINALS, he circuited again for a landing on RW30. The RW was clear and he was the first ac in the landing sequence for RW30 with two ac following behind.

On touchdown, he was welcomed to Bembridge and asked by the A/G Operator to "… expedite a backtrack on RW30 and then exit left onto the hard taxiway". This was due to soft ground conditions on the 'normal' grass taxiway. After landing and a short ground roll, he made a U turn on the RW and whilst backtracking down RW30 heading 120° at 10kt, he observed another PA28 - the subject PA28-180 [PA28 (B)] on FINALS about 800m away. Expecting the pilot of PA28 (B) to execute a go-around he continued backtracking along the RW to the taxiway. Whilst not yet at the taxiway, he realised that the pilot of PA28 (B) was going to continue with his landing and so he pulled over to his L [the RH side of RW30] and broadcast on the Bembridge A/G Station frequency (123·250MHz) that he was "… still on the RW". The pilot of PA28 (B) continued with his landing – fortunately on the L side of RW30 – and passed his ac starboard to starboard about 8m away while on the final phase of landing (ground roll) with a *"high"* risk of a collision.

**THE PA28-180 PILOT [PA28 (B)]** provided a very frank account reporting that he gained his PPL in September of 2007, some 4 months before the Airprox occurred. He had only landed twice before at an aerodrome where an Air/Ground Communication Service was provided – both of these occasions were at Bembridge - but on very quiet days with no other traffic in the cct.

On this day he arrived from Blackbushe via Midhurst and established contact with Bembridge RADIO overhead Hayling Island. He executed an overhead join for RW30 - reporting overhead on the RT. Descending DEADSIDE to 1000ft QFE, he called "..DEADSIDE" when Bembridge advised that there was one in the cct ahead of him. Joining the cct for RW30RH at 1000ft QFE CROSSWIND, he called "..DOWNWIND" when abeam the downwind end of RW30 and "..No 2 to land". The ac ahead of him was flying what appeared to him to be quite a lengthy DOWNWIND leg and mindful that after landing on RW30 at Bembridge ac have to backtrack to taxi off the RW he flew a wide DOWNWIND leg to gain some separation between himself and the ac that was No 1 ahead of him in the cct. [UKAB Note (1) in a subsequent telephone conversation with UKAB Staff the pilot advised that he did lose sight of PA28 (A) ahead for a while.] Turning BASE LEG at 1000ft QFE he started his descent and upon turning FINALS, now lined up with RW30, he called "..FINALS" and received a wind reading for RW30. He then saw what he thought at the time was another ac at a much lower level (maybe as low as 500ft QFE) cutting across from the S on a converging course. It was not clear to him at first where this ac was headed [it was actually the No1 that he had re-acquired]. Then he heard an ac callsign and a "FINALS" report over the radio with a wind reading from

Bembridge RADIO in response - he judged that this was either the ac in view, [which it was - PA28 (A)] or someone behind him so continued his approach. Next he saw the other ac - PA28 (A) - land on RW30. He heard the radio call inviting PA28 (A) to backtrack. At this stage he was preparing in case he needed to go-around. As he continued his descent PA28 (A) was backtracking and its pilot had positioned towards the RH edge of RW30. At a height of about 200ft on FINALs heading 300° at 70kt he saw that PA28 (A) was on the RW very close to the "RW exit" and he decided to proceed with the landing. As a precaution he positioned his ac to the LH side of the RW30 centreline and landed his ac with about 20-30ft of horizontal separation between the two ac, but he noticed that PA28 (A) was still on the edge of the RW and had not vacated. He reports quite openly that it was immediately clear to him that he should have 'gone around'.

After landing the pilot of PA28 (A) approached him. The pilot of PA28 (B) made it clear to the pilot of PA28 (A) that in retrospect, he should have 'gone around'. Had the preceding PA28 (A) not been backtracking on the edge of the RW and been very close to the RW exit he would have 'gone around' and so he does not believe that there was a risk of collision, but he realises that he should have set a decision point to 'go-around' much sooner and not attempted to "second guess" a preceding ac's vacation from the landing RW.

**THE BEMBRIDGE AIR GROUND STATION OPERATOR** (A/G) reports that the pilot of PA28 (A) called FINALS and was advised of the surface wind. As there were a few ac in the circuit a blanket call of, 'all landing aircraft may have to backtrack to vacate' was issued by A/G. The pilot of PA28 (A) having landed on RW30 was advised to backtrack and vacate first hard left as the grass taxiways were water logged. The pilot of PA28 (A) acknowledged this and started to backtrack, whereupon the pilot of PA28 (B) called FINALS and was given the surface wind and advised 'one aircraft backtracking'. This was acknowledged by the pilot of PA28 (B) whilst on FINALS. PA28 (A) was continuing to backtrack as the pilot of PA28 (B) carried on with his approach getting close enough that as he was about to give a warning, the pilot of PA28 (A) called up with "I'm still on the runway". At this point the backtracking PA28 (A) was close to the turn off. A/G immediately followed up with 'one on the runway'. Nothing was heard from the pilot of PA28 (B) who touched down and screeched up the runway with heavy breaking towards the intersection and PA28 (A) who was still fully on the runway. (A/G Note: there were 2 ac waiting for departure at the intersection). The pilot of PA28 (B) made no attempt at a 'go around'. PA28 (B) veered past the south side of the previously landed PA28 (A) with little room to spare and continued up to the end of the runway with no further call. The pilot of PA28 (A) vacated the runway and parked, whilst the pilot of PA28 (B) was advised to backtrack and vacate first hard L, which he did without acknowledgement. Neither pilots contacted the Control Tower after landing and no explanation was given by the pilot of PA28 (B) as to why he continued to land with one still on the runway.

Unofficial Weather report: S/W: 270/11kt; Vis: 20k+; Blue sky with FEW at 8-10,000ft;

QFE: 1009mb; QNH 1011mb.

UKAB Note (2): The UK AIP at AD 2-EGHJ-1-2 promulgates Bembridge ATZ as a circle radius 2nm centred on mid-point of the longest notified RW (12/30) 504041N 0010634W except that part of the circle SW of a line joining 504100N 0010939W and 503851N 0010748W [where the Sandown ATZ adjoins]. The ATZ extends from the sfc to 2000ft above the aerodrome elevation of 53ft and is active in Winter 0830-1800UTC, during which time an A/G Service is provided, C/S Bembridge RADIO, on 123·250MHz.

UKAB Note (3): This Airprox occurred outwith recorded radar coverage. However, it was feasible to track the 3 ac in the cct intermittently using the Pease Pottage SSR until they reached about ½nm FINALS for RW30. It was evident that following the reported go-around, PA28 (A) as the No1 ac in the cct had flown DOWNWIND to a range of about 2·2nm before turning BASE-LEG. As recorded at Note (1), the subsequent telephone conversation with the pilot of PA28 (B) revealed that he had lost sight of the No1 ahead in the cct – PA28 (A) - but had then re-acquired it after turning BASE-LEG, believing erroneously at the time that this was another ac approaching from the S that had cut in front, partly because a different voice (female) had been heard on the RT. However, it was evident from the radar recording and the A/G Operator's report that this was not the case. PA28 (B) had followed PA28 (A) in the cct and landed.

UKAB Note (4): The ANO at Section 2, The Rules of the Air 2007, Regulations specifies that:

Landing and take-off

Rule 14.—(2) Subject to paragraph (5), a flying machine or glider shall not land on a runway at an aerodrome if there are other aircraft on the runway.

(5) Paragraph (2) …shall not apply if the air traffic control unit at the aerodrome otherwise authorizes the flying machine or glider.

## PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac, radar video recordings and a report from the A/G Operator.

Whilst it was clear to the Members that the pilot of PA28 (B) had acted contrary to the Rules of the Air and good aviation practice, the Board commended the inexperienced pilot for his very frank and honest account. It was clear that he had made a very unwise decision to continue with his landing, when he could plainly see that PA28 (A) still occupied the runway. Without the benefit of any formal clearance to land, in the absence of a full Aerodrome Control Service at Bembridge, this might well have affected this inexperienced pilot's decision-making process here. The pilot of PA28 (B)'s own frank admission that he should have 'gone around' and should have made that decision much earlier was sound, indicating that he had 'hoisted-in' this lesson after the event. The subsequent close quarters situation on the RW was entirely the result of his unwise decision to continue with the landing and it was unfortunate that he had not realised that at the time. The Board concluded unanimously that this Airprox had resulted because the pilot of the PA28-180 [PA28 (B)] landed whilst the PA28 Cadet pilot [PA28 (A)] was still backtracking on the RW.

It was evident that Bembridge had experienced some wet weather because of the waterlogged grass manoeuvring area. A highly experienced GA Member observed that it was very fortunate that the paved runway surface was not wet itself, which might well have effected braking action and winter operations can be quite demanding on the inexperienced, necessitating extra care. He expanded on the perils of trying to avoid another ac on a wet runway whilst landing and rolling out and the difficulties that might ensue were readily apparent. It was therefore, fortunate that in this instance the pilot of PA28 (B) had been able to keep his ac on the LH side of the RW during the landing roll. Whilst considering the inherent risk, a Member who was familiar with operating at Bembridge observed that the RW surface is about 75ft wide and that the span of a PA28 is about 35ft. Whilst it was not clear exactly what room was available on the RW with the port wing of PA28 (A) possibly over the RW edge, there was clearly very little room for manoeuvre. Indeed the only option probably available to the pilot of PA28 (A) to avoid a collision 'in extremis' would have been to taxi his ac off the RW onto the grass it seemed. As it was, the reporting pilot had opined that there was 8m clearance between the two ac, a difficult distance to judge abeam, which was not dissimilar from the view of the pilot of PA28 (B) as he landed and who considered there was no risk. Nevertheless, the pilot of PA28 (A) who considered the risk to be "high" should not have been placed in this close quarters situation. With little debate, Members agreed unanimously that an actual risk of collision had existed in the circumstances conscientiously reported here.

## PART C: ASSESSMENT OF CAUSE AND RISK

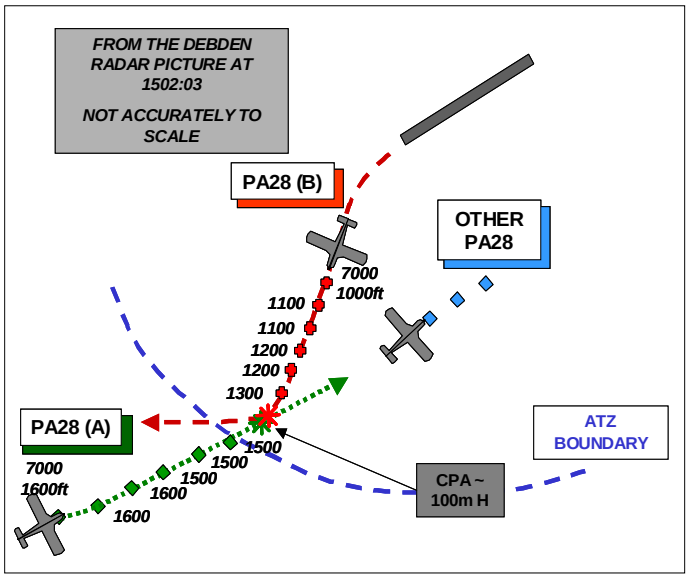
Cause: The pilot of the PA28-180 [PA28 (B)] landed whilst the PA28 Cadet pilot [PA28 (A)] was still backtracking on the RW.

Degree of Risk: A.

## AIRPROX REPORT No 006/08

## AIRPROX REPORT NO 006/08

| | | |
|---|---|---|
| *Date/Time:* | 12 Jan 1502 (Saturday) | |
| *Position:* | 5205N 00008E(Duxford CCT-elev 124ft) | |
| *Airspace:* | ATZ | (Class: G) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | PA28 | PA28 |
| *Operator:* | Civ Pte | Civ Pte |
| *Alt/FL:* | 1000ft (QFE 1008mb) | NR (NR) |
| *Weather* | VMC CAVOK | VMC NR |
| *Visibility:* | | 10km |
| *Reported Separation:* | 50ft V/50m H | NR |
| *Recorded Separation:* | NR V /~ 100m H | |




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

**THE PA28 PILOT (A)** reports flying a private VFR flight inbound to Duxford from Wellesborne Mountford in a blue and white ac with strobes selected on, squawking 7000 with Mode C and in receipt of a FIS from Duxford. He was flying a normal approach to Duxford, joining downwind for RW24 from the W, level at 1000ft on the QFE 1008mb [he thought] and heading 060° at 95kt when a departing ac appeared in his 11 o'clock position 50/100ft away. At the time he was no more than 100m from joining the downwind leg. He immediately turned right and descended and he thought that the other ac had turned right at the same time.

The normal joining procedure for RW24 is a left-hand circuit at 1000ft with no overhead joins or dead side. He heard no radio message from the other ac requesting an early left turn after departure.

He assessed the risk as being very high.

**THE PA28 PILOT (B)** reports flying a VFR private flight from Duxford to Elstree in a blue and white ac squawking with Mode C and in communication with Duxford. He departed from RW24 and at about 8-900ft AGL commenced a climbing LH turn towards BKY, continued by climbing to 2400ft and changed frequency to Essex Radar soon afterwards.

He was in uncontrolled airspace and VMC with good visibility and not aware of another ac in the vicinity at the time [See UKAB Note: (2) below].

As the pilot of the other PA28 reported that he (PA28 (B)) was in his (PA28 (A)'s) 11 o'clock, he then assumed PA28 (A) was entering the circuit or very early downwind and its pilot would have noticed his ac in a climbing turn on climb out from the active RW. Since he was in a left-hand [See UKAB Note: (2) and radar diagram] climbing turn he would not have seen the other ac in that position as he does not have downward visibility on the right-hand side of the ac. He was not aware of an ac in the downwind or early downwind position when he commenced his turn.

No call was heard from PA28 (A) nor was any Airprox reported on the RT.

He is an experienced pilot with single and multi engine with instrument ratings and is a regular visitor to Duxford. He is also aware of the need to keep a good lookout at all times when VFR and is aware that in uncontrolled airspace pilots must maintain visual separation at all times.

He did not assess the risk.

UKAB Note (1): An analysis of the Debden Radar shows the incident clearly. As the recording starts, an ac (PA28 (B)) is seen getting airborne from RW 24 at Duxford. At 600ft London QNH (1009), at a point just after the airfield boundary, it turns left onto a track of 195° inbound BKY and continues its climb. As this ac turns, the other PA28 (A) is 3nm in its 12 o'clock tracking 135° at 1800ft (QNH) before turning left onto 060° at 1600ft to establish on a long (2nm) downwind position from Royston. PA28 (A) continues on 060° descending to level at 1500ft while PA28 (B) continues towards PA28 (A) on a line of constant bearing in a slow climb. At 1502:02 the ac are 350m apart, 1.8nm SSW of the airfield, with PA28 (A) at 1500ft (QNH) and PA28 (B) in its 11o'clock. Unfortunately, its Mode C drops out at this point: on the previous sweep (6sec before) it indicated 1300ft still climbing. Just before the CPA, PA28 (B) appears to initiate a hard right turn through at least 70° - its Mode C still does not show - while PA28 (A) descends by 100ft. The ac then diverge, PA28 (B) to the W and PA28 (A) joining downwind.

UKAB Note (2): Since PA28 (B) pilot's report did not seem to accord with the radar recording, the Secretariat contacted him requesting further information, in particular as to whether or not he saw PA28 (A). He does not recall seeing another but accepts totally that the radar recording is accurate. He flies VFR to Duxford fairly frequently but did not submit his report until 2 months after the event so it might be that he did see the other ac and avoided to the right. If that had actually been the case he did not consider the event particularly noteworthy and did not execute any violent avoidance, which he would have remembered.

**ATSI** reports that the Duxford ATZ is a circle radius 2nm centred on the longest RW (06/24), from surface to 2000ft aal.

[UKAB Note: The timings do not correlate accurately with those on the Radar recording].

PA28 (B) pilot was instructed to taxi to Holding Point Alpha for RW24 LH by the Duxford FISO at 1453 and passed the QNH of 1007mb. Approximately two minutes later, PA28 (A) (locally based) established communication with the FISO, reporting at Royston for rejoin; the pilot was informed that the RW was 24, LH circuit and passed the QFE of 1003mb. The pilot said he would call downwind. At 1457, the pilot of PA28 (B) reported ready for take off at Alpha and was told that he could take off at the pilot's discretion and was passed the surface wind of 240/6kts. In view of the continued presence of PA28 (B) on the RW, another PA28 - on final approach - reported going around. This ac was requested to report downwind and was informed of PA28 (A) joining from Royston. Subsequently, it positioned in the circuit ahead of PA28 (A).

The pilot of PA28 (B) reported transferring to Essex Radar at 1500. Shortly afterwards, the pilot of PA28 (A) reported downwind and about ninety seconds later turning base leg. Neither of the subject ac made any comment on the frequency regarding an Airprox.

The UK AIP states the Duxford Noise Abatement Procedures. Of note: 'There are no overhead joins at Duxford to assist in deconfliction of circuit patterns; Circuit patterns are variable with no dead-side. It is therefore essential that pilots obtain a briefing from Duxford before departure whether inbound or outbound; traffic joining for RW24 LHC join downwind and position for 2nm final.' In order to avoid CAS around Stansted 'inbounds from the N for RW 24: Route via Royston to join downwind'.

## PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

GA Members pointed out that where for sound reasons local procedures require downwind joins, extra care must be exercised to prevent situations just like this one where the tracks of departing ac can conflict or cross with those of ac joining the visual cct. Visual procedures in the locality of an aerodrome depend on an accurate knowledge of the number of ac in the area and a good lookout which leads in turn to sufficient visual spacing between those ac. Some airfields employ height separation between joining and departing ac but others operate quite successfully without such a procedure. However, in the recent past there has been at least one such incident per year reported to the UKAB.

Members concluded that despite PA28 (B)'s change of track, seen on the radar recording, the pilot probably had not, as he reported, seen the incoming PA28 (A) which had not yet, at the time of the incident, fully descended to circuit height (as can be seen on the radar recording).

Since the pilot of the departing ac probably did not see the joining one and the latter's pilot saw the departing one only very late, there had clearly been a reduction to normally accepted safety standards. However, PA28 (A) pilot's late but effective avoidance ensured that there was no actual collision risk.

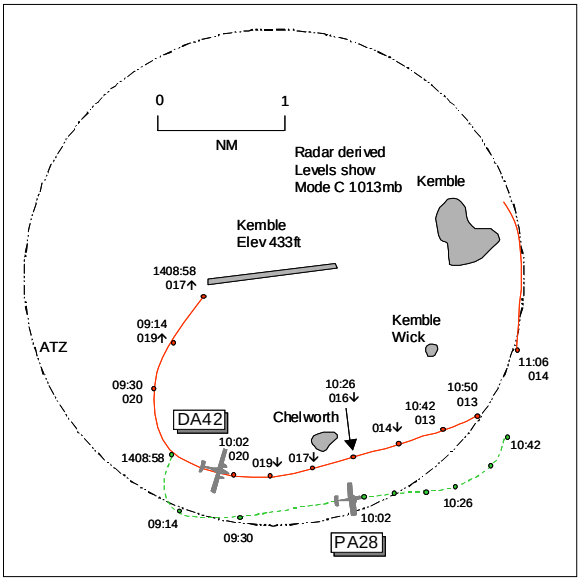
## PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A non-sighting by the pilot of PA28 (B) and a late sighting by the pilot of PA28 (A) in the Duxford ATZ.

Degree of Risk: B.

# AIRPROX REPORT NO 007/08

| | | |
|---|---|---|
| *Date/Time:* | 12 Jan 1411 (Saturday) | |
| *Position:* | 5139N 00201W (2nm SE Kemble - elev 433ft) | |
| *Airspace:* | ATZ | (Class: G) |
| | *Reporting Ac* | *Reporting Ac* |
| *Type:* | PA28 | DA42 |
| *Operator:* | Civ Trg | Civ Trg |
| *Alt/FL:* | 900ft↓ (QFE) | 900ft (QFE) |
| *Weather* | VMC CLNC | VMC CLBC |
| *Visibility:* | >10km | >10km |
| *Reported Separation:* | 50-75ft V/Nil H | 'above' V/50m H |
| *Recorded Separation:* | NR | |




**BOTH PILOTS FILED**

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

**THE PA28 PILOT** reports flying a dual training sortie from Kemble and in receipt of an AFIS from Kemble Information on 118·9MHz squawking 7000, he thought, with Mode C. The visibility was >10km in VMC and the ac was coloured blue/white with anti-collision light switched on. Established on base leg RW26 LH cct heading 360° at 80kt descending through 950-900ft QFE following the promulgated noise abatement procedure, his student exclaimed loudly as he spotted a DA42. He, the instructor, looked L and saw the ac about 100m away approximately 50ft below approaching at high speed. He raised the ac's nose into a climbing attitude, stopping its descent, and applied some power, the DA42 passed 50-75ft below, maintaining its height. It was seen to continue away to the E before leaving the ATZ, flying around the far side of Kemble village and re-establishing on the deadside, apparently making no attempt to conform with the standard traffic pattern or noise abatement procedures. He assessed the risk as medium.

**THE DA42 PILOT** reports flying a dual training sortie from Bournemouth to Kemble and in communication with Kemble Information squawking with Mode C. The visibility was >10km in VMC and the ac was coloured white with strobe lights switched on. Whilst in the cct at 900ft and 130kt crosswind for RW26 following a go-around on the previous cct, he saw a PA28 downwind but he became pre-occupied with trying to get his student to slow the ac down in the cct and identifying the villages to avoid for noise abatement. He lost sight of the PA28 and under-estimated the speed at which they were catching it up and that it was slightly wider than them in the cct. He next saw the PA28 as it popped-up in front on base leg, passing through their 12 o'clock, slightly above, crossing from R to L whilst they were still late downwind. He could hear the PA28's engine and see its pilot clearly, estimating it passed 50m away just above. With hindsight he realised he should have maintained sight of the PA28 but thought that the other pilot should have looked inside his turn onto base leg. He assessed the risk as very high.

UKAB Note (1): Met Office archive data shows the Lyneham METAR as EGDL 121350Z 20008KT 9999 FEW015 SCT150 07/04 Q1007 BLU NOSIG. The METARs for Gloucestershire and Brize Norton were very similar and the Kemble QNH was assessed as being 1007mb.

UKAB Note (2): The UK AIP at AD 2-EGBP-1-2 promulgates Kemble ATZ as a circle radius 2nm centred on longest notified runway 08/26 514005N 0020325W from SFC to 2000ft aal, elevation 433ft. Page 1-3 Para AD 2.21 Noise Abatement Procedures states a) Pilots should avoid overflying the villages and hamlets of Kemble, Kemble Wick, Rodmarton, Culkerton, Ashley and Chelworth, b) Final approach to Runway 26 is offset to the South to avoid overflying Kemble village. Para 2.22 Flight Procedures states b) Circuit Heights: Jet circuit 1500ft aal. Fixed-wing 1000ft aal. Helicopters/Microlights – 600ft aal.

UKAB Note (3): A UK Flight Guide publishes a map showing the noise abatement preferred tracks for RW08/26. Chelworth and Kemble Wick villages are 1·3nm SSE and 1·3nm ESE of the ARP respectively. Kemble Wick avoidance by Fast Jets/Microlights and Helicopters is by turning 'inside' the village and light ac by turning 'outside' whilst positioning onto base leg. Light ac should also turn onto final approach remaining SW of Kemble which is at range 1nm on, and N of, the extended C/L RW26.

UKAB Note (4): The radar recording does not capture the CPA but clearly shows the events leading up to the Airprox. The Clee Hill radar recording at 1408:58 shows a 7000 squawk, believed to be the DA42, turning crosswind indicating unverified FL017 (1520ft QNH 1007mb), climbing, GS 95kt with a primary only return, believed to be the PA28, 1·3nm to its S tracking S'ly. Sixteen seconds later the PA28 has turned L downwind whilst the DA42 is tracking 200° climbing through FL019 (1720ft QNH). A further 16sec later (1409:30) the DA42 levels at FL020 (1820ft QNH) and is seen to have commenced a L turn with the PA28 1·25nm to its SSE on a steady downwind track. At 1410:02 the DA42's GS has increased to 130kt as it is about to roll out downwind with the PA28 at range 1nm in its 12 o'clock. The DA42 then commences a descent 8sec later and by 1410:26 the ac's GS is showing 160kt as it descends through FL016 (1420ft QNH), the PA28 now in its 1 o'clock range 0·8nm. The PA28 is last seen on primary at 1410:42 as it is about to steady onto base leg in the DA42's 1230 position range 0·5nm as the DA42 levels at FL013 (1120ft QNH). The DA42 is seen for 1 further sweep before fading from primary and secondary radars for 1 sweep, next appearing at 1411:06 2nm ESE of Kemble tracking N'ly and indicating FL014 (1220ft QNH).

## PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

From the recorded radar, the DA42's flightpath was noted to be somewhat erratic, looking at the crosswind track flown; the high speed attained and the climb above the cct before descent back to cct height on the downwind leg. Members opined that the DA42 instructor had concentrated on his trainee's actions and the need to follow the noise abatement procedures, one experienced flying instructor Member commenting that during any training sortie there comes a point where the instructor has to say 'stop' to the trainee and take over control of the ac. The speed differential had led to the DA42 quickly catching up and flying into conflict with the PA28 on the downwind leg, after the DA42 instructor had lost visual contact with it and this had caused the Airprox.

If the PA28 had been kept in visual contact after the initial sighting, the DA42 pilot would have had the option of passing/overtaking it on its R whilst allowing his trainee to sort out the ac's configuration whilst integrating with the cct traffic. However, this had not happened as the DA42 pilot only saw the PA28 again as it crossed in front from R to L just above before passing 50m clear. Fortunately the PA28 student had seen the DA42, albeit very late, to his L which alerted his Instructor to its presence. The Instructor, on seeing the approaching DA42 about 100m away and 50ft below, had arrested the PA28's descent before the DA42 was seen 50-75ft below. The Board agreed that the actions taken by the PA28 Instructor had been enough to remove the actual collision risk but that safety had not been assured during the encounter.

Members considered that the one major lesson to be learnt from this incident is the need to maintain a good lookout in the visual cct.

## PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The DA42 pilot flew into conflict with the PA28 having lost sight of it in the cct.

Degree of Risk: B.

## AIRPROX REPORT NO 008/08

| | | | |
|---|---|---|---|
| *Date/Time:* | 20 Jan 1320 (Sunday) | | |
| *Position:* | 5606N 00400W (8nm N Cumbernauld) | | |
| *Airspace:* | Scottish FIR | (Class: G) | |
| | *Reporting Ac* | *Reported Ac* | |
| *Type:* | PA38 | PA28 | NO DIAGRAM POSSIBLE |
| *Operator:* | Civ Trg | Civ Club | (Insufficient information) |
| *Alt/FL:* | 1800ft | NR | |
| | (QFE 1012mb) | | |
| *Weather* | VMC CAVOK | NR NR | |
| *Visibility:* | 30km | NR | |
| *Reported Separation:* | | | |
| | 50ft V/1-200ft H | NR | |
| *Recorded Separation:* | | | |
| | NR | | |

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

**THE PA38 PILOT** reports flying a trial lesson in a white ac with strobes switched on, squawking 7000 with Mode C. He had just called Cumbernauld Radio to advise them that they were transferring back to Glasgow Approach. They were heading 330° at 90kt and just as he was about to select the new frequency he noticed another ac about 1nm away in their 10 o'clock, on a converging course and slightly higher (50 to 100ft) so he made his student - who was at the controls - aware of it. The other ac was on what seemed to be a converging course so this took his full attention and he delayed contacting Glasgow APR. The other ac then turned right so he thought it was intending to give way to him as per normal avoidance procedure. However, to his surprise the ac stopped the turn to track directly in front of them. Up to then his student was in control throughout but as the other ac approached their 12 o'clock he was uncomfortable with the safety margin so he took control and pitched the ac down,descending by about 100ft to pass about 50ft below. The other ac continued on track Alva and took no avoiding action.

On their return to Glasgow, suspecting the other ac may have been Cumbernauld based, he contacted their ATC who confirmed the ac had been airborne between 13:15 and 13:35hrs. He therefore called Cumbernauld Flying School and spoke to the CFI who advised him that the ac was on an instructional flight. The PIC of the other ac was also an instructor so he asked that instructor to contact him to discuss the incident. He later called back and established that the other pilot had not seen them.

He assessed the risk as being high.

**THE PA28 PILOT** had left the school concerned and returned to Spain. The CFI contacted him but he declined to complete an Airprox report. The CFI confirmed however that he did not see the other ac.

UKAB note (1): The ScACC radar recording was of poor quality and not useable.

### PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted solely of a report from the PA38 pilot.

Members were disappointed that the PA28 pilot elected not to provide a report as this combined with the lack of any radar data meant that the Board had little hard information on which to base its deliberations.

Members were able however to determine that both ac had been operating legitimately in Class G airspace where the pilots had an equal and shared responsibility to see and avoid other traffic. Under the Rules of the Air, the PA38, having the other ac on its left, had right of way, but that of course is dependant on both pilots seeing each other's ac. In this case, apparently the PA28 pilot did not see the PA38 therefore he could not avoid it, forcing the PA38 pilot to take his own late, but effective, avoiding action which prevented any risk of collision.

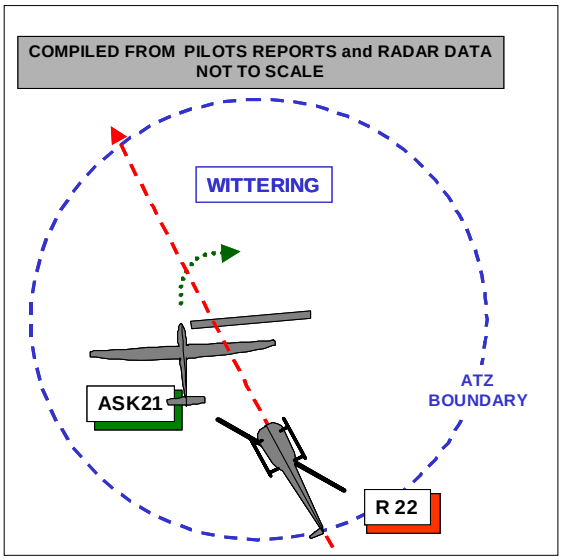
## PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Apparent non-sighting by the PA28 pilot.

Degree of Risk: C.

## AIRPROX REPORT NO 009/08

| | | |
|---|---|---|
| *Date/Time:* | 27 Jan 1530 (Sunday) | |
| *Position:* | 5237N 00028W (Wittering - elev 273ft) | |
| *Airspace:* | Wittering ATZ | (Class: G) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | ASK21 | R22 Heli |
| *Operator:* | Civ Club | Civ Pte |
| *Alt/FL:* | 1300ft | NR |
| | (QFE 1020mb) | (QNH NR) |
| *Weather* | VMC | VMC Clear |
| *Visibility:* | >50km | 40nm |
| *Reported Separation:* | | |
| | 100ft V/<20m H | 500ft V/Nil H |
| *Recorded Separation:* | | |
| | NR | |




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

**THE ASK21 PILOT** reports that glider winch launching was taking place to the W at RAF Wittering, within the ATZ up to 2300ft. He launched on an instructor training flight at about 1525hrs to a height of 2000ft aal. After a brief climb in wave, the glider was descending gently (about 1 mps) in a series of turns about 1km N of the centreline and abeam the W end of the RW. As they were turning from a heading of approx 000° to 090° at 50kt, an R22 helicopter appeared from their 6 o'clock position and flew over them with less than 50ft horizontal separation and 50 to 100ft vertical separation (their turn meant that they crossed under the R22). The R22 had also crossed the active winch line below the top height of the cable and well within both the ATZ and the published Glider Launch zone. The ac was sufficiently close to them that they had a brief glimpse of its registration on the boom as it passed.

He did not assess the risk.

**THE R22 HELICOPTER PILOT** reports flying a blue and white ac to Gamston from a private site 5nm S of Wittering. The strobe was switched on and he was squawking 7000 but Mode C was not fitted. After takeoff whilst climbing on a heading of 330° at 80kt, he called Cottesmore LARS on 130.20 but they did not reply so he passed the details of his flight blind. Shortly afterwards he saw a glider just N of Wittering flying parallel with the RW but just to the W. The visibility was excellent and he first saw the glider from 4nm and as a result climbed from 1500ft to 2500ft agl. Since there was no risk he took no other avoiding action.

UKAB Note (1): The recording of the Debden Radar shows the R22 tracking 330° about 1nm to the W of the airfield datum at Wittering. It is squawking 7000 but has no Mode C readout. The glider does not show at any time.

UKAB Note (2): The Wittering ATZ is a circle of 2½nm radius up to 2000ft aal (2273ft amsl) and is active H24. Neither Wittering ATC nor Cottesmore LARS is however active at weekends.

UKAB Note (3): Wittering is promulgated as a Glider Launching Site (by winch/ground tow (W) and tug aircraft/ motorglider (T) in the UKAIP (Civ) at ENR 5-5-1-6 up to 3000ft [agl] for the hours above. It is also notified in Vol 3 of the UK Mil AIP as operating up to 3000ft [agl].

### PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members were disappointed to note that this was another occurrence where a light ac flew through an active glider launch site below the height promulgated and clearly marked on the VFR chart as maximum winch launch height. The Board considered why this had happened.

The Board noted that when seeing the glider at a distance of 4nm (shortly after lift off) the R22 pilot was flying at 1500ft and he climbed as a result of the sighting. One Member pointed out that if 1500ft had been his planned height for the leg, then he would also have infringed the Wittering ATZ which was on his track and is permanently active up to 2000ft aal. Bearing this in mind he suggested that the source of the problem had most likely been poor route selection followed by inadequate flight planning and route study. This, he considered was further exemplified by the R22 pilot being unaware that Cottesmore LARS is not available at weekends and apparently that the Wittering ATZ is permanently active and therefore cannot be penetrated without permission from ATC. (If there is no response to a call to them the ATZ must be avoided).

Due to the differing height reports given by the two pilots and the lack of any Mode C information, Members could not be certain whether or not the R22 had actually infringed the ATZ in addition to overflying the glider launch site. The Helicopter Member, who was very familiar with the R22, pointed out that the registration, which is painted on the tail boom (itself little over a foot in diameter), is only of the order of 9 inches in height and therefore one must be fairly close to be able to read it as the glider pilot did; in his opinion much less than 500ft, the separation reported by the R22 pilot. Members therefore, agreed that the 100ft vertical separation reported by the glider pilot had probably been the more accurate.

Despite that flying close to a glider launch cable (the Gliding Member described a moving launch cable as being akin to a chain-saw) is a very dangerous activity, the glider in this instance was not at the time on a winch launch and Members agreed that the R22 pilot had seen and maintained visual contact with the glider until he passed above it, albeit by a closer margin than ideal; therefore there was no risk that the ac would have collided.

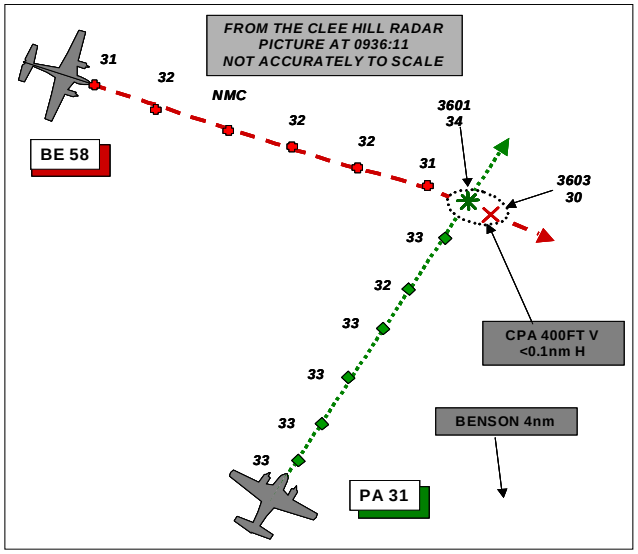
## PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The R22 pilot flew through a notified and active Glider Launching Site and into conflict with the ASK21 glider

Degree of Risk: C.

## AIRPROX REPORT NO 010/08

| | | |
|---|---|---|
| *Date/Time:* | 30 Jan 0936 | |
| *Position:* | 5149N 00102W | (3nm SW Westcott) |
| *Airspace:* | Lon FIR | (Class: G) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | PA31 | BE58 |
| *Operator:* | HQ Air (Ops) | Civ Pte |
| *Alt/FL:* | 3300ft | NR |
| | (QNH 1024mb) | (N/K) |
| *Weather* | VMC CAVOK | VMC CAVOK |
| *Visibility:* | 40km | >10km |
| *Reported Separation:* | | |
| | 500ft V/0 H | 300-500ft V/0 H |
| *Recorded Separation:* | | |
| | 400ft V/<0.1nm H | |




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

**THE PA31 CHIEFTAIN PILOT** reports flying a blue and white ac with HISLs switched 'on' on a VFR training flight from Boscombe Down to RAF Coningsby, squawking 3601 with Mode C and in receipt of a RIS from Benson. The ac was established in the cruise, heading 035° at 185kt and at 2900ft on the QNH passed. General contacts had been previously called by Benson. However, some reports were confusing as slightly poor radio performance resulted in left/right 9/3 o'clock transpositions. At about 0937, a new contact was called in their *'left 10 o'clock passing left-right'* but the PF misheard the TI as left 2 o'clock: the pilots' assistant quickly confirmed the direction passed by ATC in–cockpit. On looking left, the PF almost immediately saw a white and orange ac in their 9 o'clock at similar level about ½nm away and coming straight towards them. The autopilot was immediately disconnected and their ac was climbed rapidly by 3-400ft levelling at 3400ft QNH. The wings were waggled but no response was seen from the other ac, which passed directly under them with about 500ft vertical separation. He reported the incident on landing and assessed the risk as being medium.

**THE BE58 PILOT** reports flying a private flight VFR from Sleap to Biggin Hill in a white and maroon ac with HISLs switched on, squawking as directed with Mode C and in receipt of a RIS from Brize Zone. While heading ESE at 180kt, Brize advised them of traffic in their right at a distance he could not recall, just before handing them over to Benson. The traffic was sighted 3nm away 45° right of the nose, slightly higher than them, about 1min before it crossed their track so they initiated a slight descent to increase the vertical separation. Just as the Navajo was about to cross above them its pilot advised Benson that he was *"Taking avoiding action*" and banked right and left before passing overhead. He believed the Navajo pilot was startled due to his late sighting of them but he had been watching him for about 1min. He assessed the risk as being none.

**MIL ACC** reports that a PA31 was receiving a RIS from Benson Zone (BENSON) while a BE58 had been receiving a RIS from RAF Brize Norton (BRIZE) but at the time of the incident was being handed over to BENSON. A U/T controller who was close to validation was occupying the BENSON position and being screened by a fully validated controller who described the workload as being 'high'. The time sources of BRIZE, BENSON and the radar replay are not synchronised so errors in times are possible.

The BE58 pilot was given TI by BRIZE at 0933:06, *'(Beech C/S) traffic right one o'clock five miles manoeuvring indicating three thousand feet above and descending; further traffic right, two o'clock seven miles (PA31 C/S) crossing right left indicating slightly above.'* The Beech pilot acknowledged saying *'Thanks a lot we are looking er (Beech C/S)'*. At 0933:48, BRIZE gave further TI to the BE58 pilot saying *'traffic left eleven o'clock six miles reciprocal indicating one thousand feet above'*, which he again acknowledged. The radar recording at 0934:02 clearly shows the three different tracks called by BRIZE, the second of which was the PA31. At 0934:24, BRIZE initiated a handover to BENSON for a MATZ transit and after giving the C/S and identifying the track and squawk to BENSON, they replied *'Contact squawk 3603'* so BRIZE passed the BE58 pilot the new squawk which he

acknowledged. BRIZE then said *'3000ft 1024'*, which BENSON repeated before going on to say, at 0934:33, *'A Beech 58 from Sleap to Biggin Hill radar information'* and BENSON again read back the information before saying *'(Beech 58 C/S) identified'*. BRIZE finished the handover at 0934:46 by pointing out the previously called traffic, saying *'Okay, traffic right 2 o'clock 4 miles crossing right to left 3601 (PA31 C/S) is called as is the traffic left 10 o'clock 4 miles north west bound on a 7000'.*

BENSON identified the BE58 and gave the BENSON frequency, then asked BRIZE LARS (LARS) for a pre-note. Whilst waiting for LARS to pick up the landline, BRIZE transmitted to the BE58 (now wearing the BENSON squawk of 3603), at 0935:12, *'(Beech C/S) previously called traffic right two o'clock three miles crossing right left indicating two hundred feet above'* and 7sec later the pilot responded with *'Ah, we're visual thanks (Beech 58 C/S)'* so BRIZE sent the BE58 to the pre-briefed BENSON frequency. At about the same time LARS picked up the landline and BENSON started to hand over an ac unconnected with this Airprox. However, at 0935:46, they stopped the handover to call traffic to the PA31, saying *'traffic left 10 o'clock 2 miles crossing left to right indicating 100ft below'* and 8sec later the pilot replied *'looking'* so BENSON updated the TI.

At 0936:11 (time taken from radar replay) the BE58 passed underneath the PA31 with 400ft vertical separation showing on radar. At 0936:14 the BE58 pilot checked in with BENSON who immediately responded, saying *'identified 3000ft 1024 radar information traffic left 8 o'clock 1 mile crossing right to left indicating 200ft above'* and the pilot replied *'Yep, we have that traffic, (Beech 58 C/S) and we're descending now to 2400ft'*. At 0936:36, BENSON continued saying *'(Beech C/S) roger report level further traffic left 10 o'clock 1 mile crossing left right crossing left to right no height information'*, to which the pilot replied *'(Beech C/S) Wilco and we're looking'*. BENSON then gave further TI unrelated to the incident and the pilot acknowledged with *'Still looking'*. Between 0936:56 and 0937:28, BENSON handed a helicopter over to BRIZE.

[ACC Note: The PA31 pilot called BENSON once, at 0937:19, but the call was not acknowledged – it is assessed that this call occurs just after the reported Airprox.]

At 0937:31, with the handover complete, BENSON passed TI to the PA31 pilot as *'traffic right 2 o'clock 2 miles similar correction reciprocal heading indicating 1100ft above'* and the pilot replied *'visual'*, but the rest of the transmission was clipped. BENSON gave the BE58 pilot the London QNH (1027) and instructed the pilot to report not above 2400ft. At 0938:06, the PA31 pilot informed BENSON *'the erm not the previous called traffic but the traffic called above that we had to climb for we're gonna have to file an Airprox for that we can do it on the ground or we can pass the details to you now.'* After being asked to *'standby',* to deal with another ac, the pilot passed the Airprox message at 0938:42, stating *'Okay, (PA31 C/S)…(clipped transmission)...we're a Chieftain aircraft and the time of the Airprox was 9, was probably about 937, 3 miles to the South of Westcott we were heading approximately 030 at 3000 feet 180 knots VMC'.* BENSON acknowledged the message and the pilot continued *'and the aircraft passed left to right we climbed approximately 500 feet vertical separation as we passed over the top of each other could you er do you know who'd controlling that or is he VFR that traffic'* and they replied *'(PA31 C/S) negative he's squawking 7000'*. Thereafter, horizontal separation increased.

It is considered that there were no Mil ATC causal or contributory factors in relation to this Airprox since both ATC Units complied fully with JSP 552 (Rules of RIS) in that:

BRIZE passed the BE58 pilot good TI on the PA31 on 2 occasions (7nm & 2nm) and as a result of the 2nd call the pilot reported *'visual'*.

BENSON passed TI to the PA31 on the BE58 on 2 occasions (2nm & 1nm).

UKAB Note (1): Neither the PA31 Station nor HQ Air wished to add any further comment.

UKAB Note (2): Under the Rules of the Air Regulations Rule 9 (3)…. When two ac are converging in the air at approximately the same altitude, the aircraft which has the other on its right shall give way.

## PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board noted that both ac were operating legitimately under VFR in Class G airspace and that both pilots had sensibly opted to use a RIS to assist them in their responsibility to see and avoid other ac. Under the Rules of the Air Regulations, Rule 9(3), the PA31 had right of way since it was on the BE58's right. Members noted that the BE58 pilot saw the PA31, called on the RT and reported that he gave way by descending however, a Member who is a GA pilot, noting the radar data, observed that the BE58 pilot could have taken some lateral separation in addition to descending by 200ft, thus providing the PA31 pilot with some assurance that he had seen and was avoiding the latter's ac. Members concurred the BE58 pilot's view that the PA31 pilot may have been startled by his late acquisition of the BE58. Although the first TI given by Benson had been slightly late at 2nm, it was accurate and was quickly followed up 1nm later. However, due to the slight confusion in the PA31 cockpit the TI had probably not been assimilated immediately by the pilot who saw the opposing BE58 later than he would have wished, leaving time to take action short.

Members agreed that this incident had been a conflict in the FIR since both pilots had seen and avoided the other ac.

## PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A conflict in Class G airspace.

Degree of Risk: C.

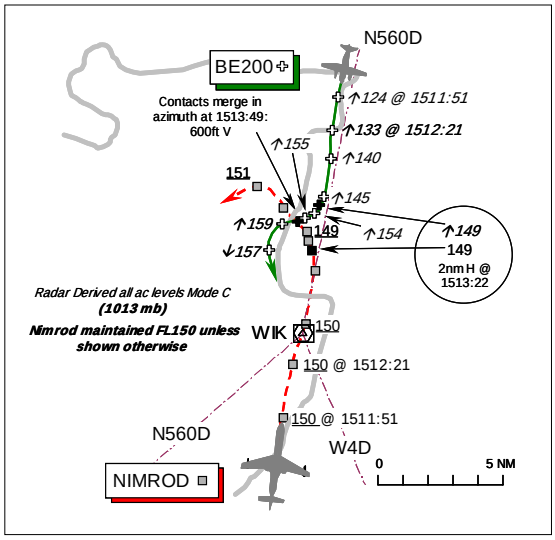
## AIRPROX REPORT No 011/08

## AIRPROX REPORT NO 011/08

| | | |
|---|---|---|
| *Date/Time:* | 29 Jan 1513 | |
| *Position:* | 5832N 00306W (4½nm N of Wick) | |
| *Airspace:* | ADR N560D | (Class: F) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | BE200 | Nimrod MR2 |
| *Operator:* | Civ Comm | HQ AIR (Ops) |
| *Alt/FL:* | ↑FL155 | FL150 |
| *Weather* | IMC NR | IMC 'tween layers |
| *Visibility:* | NR | NR |

*Reported Separation:*
Fm TCAS: 500ft V/nil H Not seen

*Recorded Separation:*
600ft V @ nil H/2nm H @ nil V




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

**THE BEECH 200 PILOT (BE200)** reports he had departed from Kirkwall under IFR and was routeing ADR N560D to the WIK thence southbound on W4D. He was in receipt of a RIS from ScACC on 129·225MHz climbing to FL155 in IMC and flying towards Wick at 180kt. The controller advised of unknown traffic 12nm ahead tracking N on which he had a TCAS contact. ATC suggested that he take his own avoiding action as required so he monitored the other ac on TCAS as it approached Wick from the SW thinking it would cross the ADR. At a range of about 7nm he decided to increase his RoC and turn R 45° onto a heading of 240°; at 5nm ATC suggested he maintain his current level at which point TCAS enunciated an RA of MONITOR VERTICAL SPEED. He disconnected the AP and increased the RoC and bank angle, as the other ac appeared to turn towards them and passed 500ft below on TCAS with a *"high"* risk of a collision. They reduced their RoC approaching FL160; when they could see they were clear [on TCAS] they resumed their own navigation to overhead Wick and descended to FL155.

Subsequently, they found out the other ac was a Nimrod taking up the hold overhead Wick with, he thought, a very late hand over from military to civilian ATC. He added that on initial contact with ScACC he requested a direct route to Aberdeen off the ADR but the controller asked him to remain on the ADR due to military traffic. He believed it ironic that if they had flown direct there would have been no conflict.

**THE NIMROD MR2 PILOT**, a QFI, reports that previously, whilst on recovery to Kinloss, he was informed he would have to hold off for 30min because of the amount of traffic on recovery. To maximise the training value he elected to fly a no-notice practice diversion (PD) to Wick. A freecall was made on the SCOTTISH MIL ICF, and a RIS obtained. He advised ScATCC (Mil) of his intentions and requested 'own navigation' to the WIK, which was approved. At this time his ac was about 15nm SSE of the WIK, flying level at FL150 heading 320° at 210kt. The SCOTTISH MIL controller [ScATCC (Mil) ALLOCATOR] then had a period of high workload with numerous RT calls. Following an instruction to squawk A7000 and call Wick APPROACH on 119·7MHz, on contact with Wick he was immediately told to call Scottish CONTROL. At this point his ac was now entering the WIK hold. As soon as he had dialled in the Scottish CONTROL frequency he became aware of the conversation between the controller and another ac – the BE200 – and it soon became apparent that TCAS avoiding action was being taken against his ac, which the ScACC controller confirmed soon afterwards. He assessed the risk was *"low". Once* separation had been achieved he was given descent in the Wick hold and continued the PD without further incident. At no time during this incident did he see the conflicting traffic due to the flight conditions at the time, which was intermittently IMC between layers. Neither TCAS, Mode S nor any other form of CWS is fitted; a squawk of A7000 was selected with Mode C. HISLs and navigation lights were on**.**

**THE ScACC MORAY COMBINED PLANNER & TACTICAL CONTROLLER** reports that the BE200 crew climbing out from Kirkwall to FL155 on ADR N560D, reportedly took a TCAS RA against unknown traffic squawking A7000. This unknown ac was previously squawking a ScATCC (Mil) code of A4620, at FL150 just N of WIK. Traffic

information had previously been passed to the BE200 crew about the unknown traffic under an "Area" ATS, which was subsequently found to be a Nimrod which had been working Wick ATC. He thought prescribed separation was eroded to 1nm at the same level. No avoiding action was issued.

**THE WICK APPROACH CONTROLLER (WICK APP)** reports that Wick ATC was phoned by the ScATCC (Mil) ALLOCATOR at 1510 asking if Wick could accept a Nimrod for a PD at 1515. Wick APP agreed to the request and received details on the Nimrod, which was level at FL150 inbound from the S with an ETA WIK at 1515 and requesting a VOR/DME procedure to RW31. He asked for the Nimrod to be kept level at FL150 and that he would coordinate the descent with ScACC. Immediately on hanging up the landline Wick APP phoned the MORAY Sector. The established procedure is that the MORAY Sector Assistant (SA) at ScACC will answer the Wick line. Wick APP asked to speak to the MORAY SC. At the same time (1511) the Nimrod crew – now in contact on RT - was instructed to maintain FL150 until Wick APP could co-ordinate their descent and therefore, to report joining the WIK hold. The MORAY SA advised that the Moray SC would phone back, which he did at 1512. Wick APP asked for descent for the Nimrod and was told he could not because of the BE200 beneath the jet. The Nimrod was then transferred to MORAY Sector.

**MIL ACC** reports that the Nimrod was returning to Kinloss after conducting a military training sortie. The Nimrod crew, at the time of the reported Airprox, was not receiving an ATS from ScATCC (Mil), but had been prior to the incident, and were attempting to obtain a procedural service from Wick whilst entering the Wick hold at FL150. Minimum vertical separation occurred at 1513:22.

Mil ACC Note: Due to technical difficulties, a tape transcript of this incident was not available. The sequence of events has been constructed from the relevant controllers, supervisors and pilots' reports.

The ScATCC (Mil) Allocator's (ALLOC) workload was "high", with the recovery of multiple ac during a Tactical Leadership Programme (TLP) exercise. The Nimrod crew had been receiving a RIS from ALLOC, who had been trying to arrange a no-notice PD into Wick, via the landline. According to the report from the ScATCC (Mil) Supervisor (SUP), the ALLOC achieved this and had sent the Nimrod crew 'en-route' at about 1511:21 [Mil ACC Note: the time was taken from seeing the squawk change on the ScATCC (Mil) radar replay] instructing the pilot to "Squawk 7000 and call Wick APPROACH (119·7MHz)".

At about the same time that the ALLOC switched the Nimrod crew across to Wick APP, the SUP reports asking the ALLOC if the Nimrod had been given traffic information on the BE200, but the ALLOC did not answer as he was busy with recoveries from the TLP, some of which were below radar cover. The SUP notes that, at that point, he recalls seeing the BE200 passing FL115 in the climb. At this point, there was 17nm and 3400ft separation between the two ac. SUP goes on to say that as he observed the two ac, STCA activated. He expected the BE200 *"..to stop climb at about FL135 (noted from its passing level). I was surprised therefore to see it climb steadily through FL140 then appear to climb more rapidly above FL150"*. The SUP added later in his report that:

"*I spoke to the ScACC Controller involved some time later who told me that the Beech 200 was under a type of service that I was not familiar with* [an AREA service] *which meant he got a RAS against participating traffic and information on non-participating traffic. He also said he tried to call Console 2 for TI but got no response (this is because the Nimrod was on a 4620 squawk which is an ALLOC squawk.* Further he said *"..he had tried to stop the Beech at FL140 but had been told to standby*".

Analysis of the Aberdeen radar replay (a camcorder recording of the replayed radar data) shows that, at 1511:21, the Nimrod changed squawk from A4620 to A7000 in compliance with ALLOC's instructions. STCA activated less than 1min later at 1512:15.

By 1513:22, the Nimrod having maintained a track of 005° through the WIK VOR, was about to turn L to take up the hold level at FL150. The Beech 200 continued to climb passing FL149. The RoC of the Beech 200 started to increase. With the Nimrod maintaining FL150, the minimum vertical separation is estimated to have occurred at about 1513:22, with the two ac at the same level, about 2nm apart. [The contacts merge in azimuth at 1513:49, the BE200 passing FL156 in the climb, some 600ft above the Nimrod maintaining FL150.] At 1513:48, the BE200 was above the Nimrod, with 600ft vertical separation between them. Thereafter, as horizontal separation increased, the BE200 began to turn L back towards WIK VOR and descended back down to FL155.

This Command considers that there were no Mil ATC causal factors relating to this Airprox because the Nimrod crew was instructed to switch to their en-route frequency when the BE200 was about 17nm away with 3400ft between them. The Nimrod was in Class F airspace and did not intend to descend. Finally, ALLOC's priorities were to the recovering (limited endurance) fast jet recoveries and managing the control team.

The SUP reported that, in hindsight, it would have helped if the Nimrod crew had been given traffic information before sending them en-route. It could be argued that this was a contributory factor. However, under a RIS, pilots are responsible for separation on other traffic, whether or not it has been called. Added to that is the fact that the Nimrod pilot might not have been able to obtain visual contact with the BE200 some 17nm away and some 3400ft below it as the crew was instructed to switch to Wick ATC. This Command considers that, whilst traffic information would have increased the Nimrod crew's SA temporarily, it would have been of limited use as the pilot would have gone en-route not knowing what level the reported traffic was climbing to nor whether it had turned.

**ATSI** reports that the Wick APP controller described his workload as light. He was unaware that an Airprox had been reported until some time after the event, as no comments were made at the time.

Wick ATC received a telephone call from the Scottish Military Assistant Allocator, at 1510, requesting if Wick would accept a Nimrod for a practice diversion in 5min. The Wick controller responded *"should be able to accommodate that"*. The Nimrod was reported to be descending to FL150 and requesting a VOR/DME approach to RW31. Wick APP controller replied *"To 3-1 okay and you put him to me when you're ready I'll co-ordinate a descent with Scottish"*. The Assistant Allocator asked if there was a squawk but it was pointed out that Wick is not equipped with radar and it would be a procedural clearance. The Wick Controller agreed that a handover was not required and the Nimrod would be transferred on a *"free call"*.

Immediately following the end of the telephone call with Scottish Military, Wick APP telephoned the ScACC MORAY Sector. [Due to previous problems with the telephone system at Wick, calls to the MORAY Sector are routed through the Assistant position (MORAY SA), but the controller added that he believed these problems had now been resolved.] Accordingly, the MORAY SA answered the telephone call [at 1511:20] and Wick APP asked to speak to the Controller. He was asked to standby. Forty seconds later he was informed that the controller would *"be with you this second"*. The MORAY SA rang off but it was some 30 seconds later before the MORAY SC telephoned Wick [establishing communication just before 1512:50].

Meanwhile, in the period that Wick APP was waiting for the Moray SC to answer the telephone, the Nimrod crew made their initial call on the Wick APP frequency, reporting at FL150. The controller replied *"..information Lima's current the Wick QNH is 1-0-1-4 maintain Flight Level 1-5-0 towards Wick"*. The pilot reported *"..4 miles south of the Beacon this time"*. The controller responded, *"if you maintain 1-5-0 next report Whiskey India Kilo joining trying to co-ordinate descent to you"*. It was some 40sec later that the MORAY controller, as mentioned above, telephoned the Wick controller.

MORAY SC asked Wick APP *"Are you trying to speak to me about something is it 1-5-0 in your overhead"*. Wick answered *"That's right yeah can I have descent on him"*. Moray replied *"No there's traffic right in beneath it at the moment so I can't give you descent"*. Wick asked *"Okay do you want me to put this one to you he's a Nimrod".* This was agreed and although the level is unintelligible on the recording, it is believed that Wick was requested to instruct the Nimrod to maintain FL150 and to contact the MORAY Sector frequency.

The conflicting traffic referred to during the telephone call was the subject BE200, whose crew had established communication with the MORAY SC at 1506, some 7min earlier. The Sector was single manned, the controller describing the workload as moderate. The BE200 pilot reported *"off Kirkwall passing Flight Level 3-4 climbing 1-5-5 towards Wick" and* was requested to squawk *"ident"*. The BE200 crew requested to route direct to the ADN (Aberdeen) VOR i.e. off the ADR to which the MORAY SC replied *"okay it's Air Traffic Advisory Service* (ATAS) *at the moment and I would like you to stay in the Advisory Route unable I'll be unable to provide you with a service otherwise there's too many military traffic"*. The pilot replied *"that's understood"*. Just before 1507, the BE200 crew was instructed to climb to FL155 to maintain.

At 1510:56, MORAY SC informed the BE200 crew *"traffic information 12 o'clock position at a range of about 12 miles Scottish Military squawk at 1-5-0 presently vaguely northbound against you"*. The pilot reported *"nothing on TCAS yet"*. Just after 1511:10, the MORAY SC continued *"Roger that traffic looks like it's starting to climb now I'll keep you advised"*. [UKAB Note (1): The Nimrod indicated FL151 briefly and then ↑FL150, but maintained FL150

thereafter.] The BE200 pilot reported at 1511:20, *"just got a contact now we will monitor"*. Immediately afterwards, the MORAY SC telephoned the ScATCC (Mil) Console 2 Controller to enquire about the unknown Nimrod which, at the time, was squawking a code allocated to the ScATCC (Mil) ALLOCATOR [calling Console 2 at the same time Wick APP was calling MORAY]. As MORAY SC did so, the unknown Nimrod ac changed squawk to A7000 and the telephone call was ended. Accordingly, just as the Nimrod crew was contacting Wick, the MORAY SC transmitted to the BE200 crew at 1511:40, *"..that traffic is not working Scottish Military it's just got a 7 Thousand squawk so I'm unable to coordinate anything it shows 1-4-9 in the descent opposite direction to you should pass your starboard side 12 o'clock 10 miles"*. The pilot confirmed he had it on TCAS. The controller responded *"I'm gonna have to say avoid at your discretion"*. STCA activated at 1512:15, as the BE200 was passing FL132 Mode C in the climb and just as the MORAY SA reported that Wick APP wished to speak to the SC. Before talking to Wick APP, the MORAY controller transmitted to the BE200 crew *"I'm getting information that says that traffic may be going into Wick for an approach 7 Thousand squawk showing 1-5-0 still 12 o'clock 5 miles"*. The controller then communicated with Wick, after which he spoke to the BE200 crew *"that's confirmed it is a Nimrod at 1-5-0 can I suggest you stop off where you are or descend to 1-4-0 to attempt to keep some space"* to which the BE200 pilot responded "[C/S] *er standby"*. The radar recordings show the two ac on reciprocal tracks, 4½nm apart, with the BE200 passing FL142 Mode C in the climb. Shortly afterwards, the controller queried the BE200's level at FL154. The pilot replied *"affirm we're just responding to TCAS"*. Straight afterwards, the Nimrod crew made their initial call on the Moray SC's frequency reporting at FL150 in the Wick hold.

Information was passed to the Nimrod crew about the BE200, now at FL156 Mode C, which was taking TCAS action against it. As the Nimrod ac was not identified, the MORAY SC suggested that the crew maintained FL150, with the BE200 at FL160, climbing. The pilot of the Nimrod reported maintaining FL150. The BE200 pilot commented *"we had to respond to TCAS on that we came within 3 hundred foot and we then saw those two contacts"*. (NB Only one contact is observed on the radar recording.) Subsequently, the BE200 crew reported *"well clear of the conflict"* maintaining FL155 towards Wick. The Nimrod was then identified in the Wick hold and after co-ordination with Wick APP, it was descended to 3000ft QNH. During the encounter, the minimum separation was assessed as 2·3nm/nilft.

ScACC Supplementary Instruction (SI) 01/08 states the following procedures:

"When aircraft have flight planned to operate IFR within an ADR, the following levels of service apply:

**AIR TRAFFIC ADVISORY SERVICE (ATAS) shall** be provided.

If **only** ATAS is being provided, the pilot shall be informed:

"Air Traffic Advisory Service – separation against participating traffic only; no information on unknown traffic"

**Note that although ATAS is a procedural service, traffic may be identified and radar used to confirm separation and level occupancy.**

**RADAR ADVISORY SERVICE (RAS)** should be provided (in addition to ATAS). The NATS licence states that controllers should endeavour to provide RAS to ADR traffic.

Note that it is unacceptable to limit RAS to participating traffic only, RAS shall be applied against all traffic.

**RADAR INFORMATION SERVICE (RIS)** may be provided (in addition to ATAS) if it is not possible to provide RAS.

*When a RIS is being provided in addition to ATAS the pilot shall be informed*

"Air Traffic Advisory Service – separation against participating traffic only: Radar Information Service against unknown traffic"

Note that traffic information must be passed on all unknown aircraft.'

On this occasion the Moray SC opted to provide an ATAS, although he did not use the correct phraseology. Additionally, he did provide traffic information about the unknown Nimrod approaching WIK, which may have confused its pilot about the type of ATS being provided. His written report stated he was in receipt of a RIS.

Wick is situated beneath the junction of two ADRs: W4D, from WIK VOR to the Aberdeen VOR (magnetic track from WIK 163°), its upper limit FL185 and N560D from Sumburgh VOR to Glasgow VOR. From WIK to BONBY, its magnetic track is 234°, with an upper limit of FL190 and approaching WIK from the N its magnetic track is 197°. The UK AIP at ENR-3-1-2-6 and-3, states the controlling authority as Scottish ACC, frequency 129·225 (MORAY Sector).

The Wick MATS Part 2 at Page 4-7, details the procedure for IFR Traffic: Under the title 'Clearance to enter Advisory Airspace' it states 'There are two advisory routes radiating from WIK VOR. For those flights who wish to participate in the advisory service, clearance to enter is to be obtained from the MORAY Controller at ScACC'. Additionally, Page 4-11, states, concerning co-ordination with ScACC: 'When the ATCO receives details, from an agency other than ScACC, of an inbound which will enter N560D or W4D they should co-ordinate the traffic with the Moray SC'.

The Wick APP controller commented that it was unusual for ScATCC (Mil) to co-ordinate Nimrod flights into Wick. Normally this would be carried out by Lossiemouth. It was also unusual for the Nimrod to be as high as FL150. As far as he was concerned he followed the usual procedures by accepting the flight, then co-ordinating its entry into the ADR with the MORAY Sector. This co-ordination process could be delayed because telephone calls are routed through the MORAY Assistant position. On this occasion, according to the information provided by ScATCC (Mil), at 1510, the Nimrod crew's estimate for WIK was 5 minutes later. However, 1 minute later the flight contacted Wick, reporting 4 miles from the airport. The controller was not aware of its proximity to WIK, as Wick is not radar equipped.

Following approval for the PD between Wick APP and ScATCC (Mil), the Nimrod crew was allowed to route to WIK at FL150 i.e. into ADRs N560D/W4D. At the same time, the BE200 flight was under the control of the ScACC MORAY Sector, routeing southbound on ADR N560D towards WIK climbing to FL155. No co-ordination was carried out with the MORAY Sector, the controlling authority for the ADRs in the Wick vicinity, before the Nimrod entered the ADRs approaching WIK. Consequently, it was not possible to arrange appropriate separation in advance of the Nimrod entering the ADR. Having accepted the flight towards WIK at FL150, the Wick Controller had little time to arrange co-ordination with the MORAY Sector. Firstly, he was not able to telephone the MORAY Controller directly and secondly, the Nimrod arrived at WIK, over 3 minutes ahead of its estimate supplied by ScATCC (Mil). Although the Wick APP Controller believed he was operating within the usual procedures, his actions did not prevent the confliction between the two ac. It is considered that Wick APP should have instructed ScATCC (Mil) to co-ordinate with the MORAY Sector before it was agreed that the Nimrod would be transferred to Wick, on a free-call, routeing to WIK.

The MORAY SC informed the BE200 pilot that he was providing the flight with an ATAS, albeit not using the correct phraseology stated in SI 01/08. Subsequently, MORAY SC used radar information to provide the BE200 crew with traffic details on the unknown ac. Although this may have confused the pilot as to the type of ATS being provided, it did ensure that appropriate information was issued early to the flight.

In order to address the prevention of any similar incidents occurring in future, the following recommendations are made:

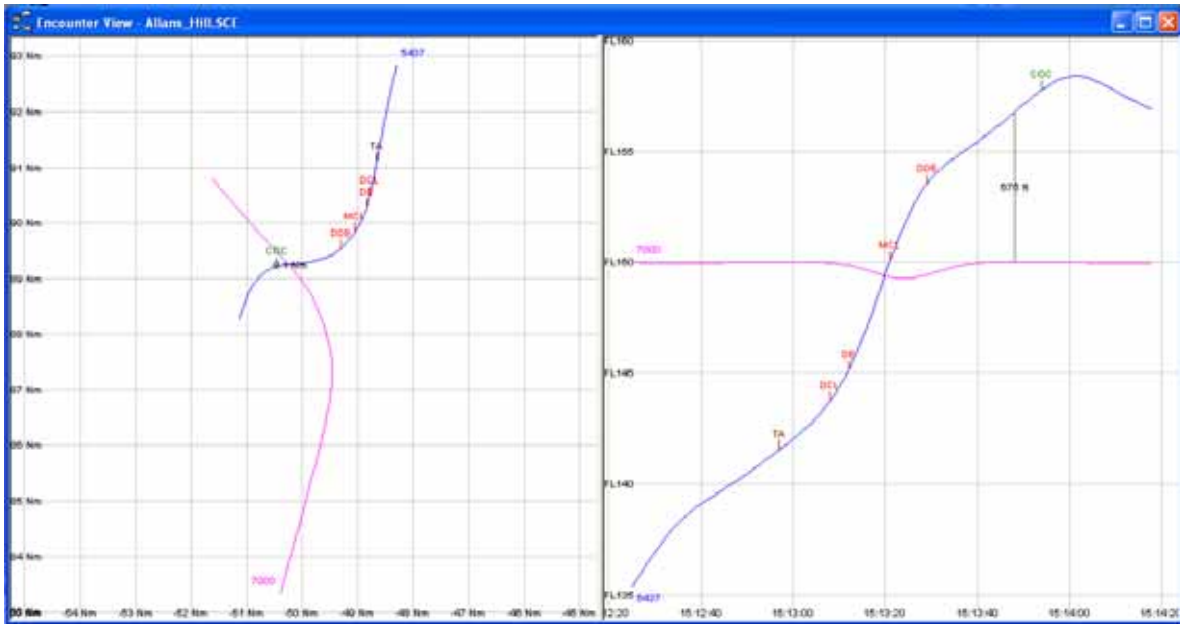
**ATSI RECOMMENDATIONS**

(1) It is recommended that Wick, ScATCC (Mil), Lossiemouth and ScACC, review the joining procedures for flights from Class G airspace into Wick, bearing in mind that Wick is not radar equipped. Any procedures should ensure that co-ordination takes place with the MORAY Sector concerning any traffic wishing to participate in the ATAS or RAS, before it enters the ADRs in the vicinity of WIK.

(2) It is recommended that the telephone system at Wick is reviewed to establish whether it is now possible to have the option of being able to dial the MORAY SC directly if necessary.

UKAB Note (2): NATS Systems Safety Department conducted a TCAS simulation of this event using the InCAS simulator. Depending on the location of the Airprox and its proximity to ground based Mode S monitoring devices, down-linked Mode S data can also be presented to reinforce the simulation data. However, in this instance no independently recorded Mode S data was available to replicate the actual TAs and RAs enunciated to the BE200

crew during this event. Moreover, only the BE200 was fitted with TCAS. Nevertheless, there is no evidence to suggest that the NATS TCAS simulation of these events using this standard simulation device was in error.




The simulation indicated that the BE200 crew (A5437) received a TCAS Traffic Alert (TA) as the ac climbed towards FL150 where the Nimrod (A7000) was in level flight at FL150. At the time of the TA the aircraft were separated by 5·55nm laterally. As the BE200 continued to climb the crew was issued with an "ADJUST VERTICAL SPEED" Resolution Advisory (RA) instructing the pilot that the aircraft should NOT climb. The radar tracks indicate that the BE200 increased its RoC, whereupon the alert changed to a "DESCEND" RA. The simulation indicates that 4sec passed between the initial "ADJUST VERTICAL SPEED" RA and the "DESCEND" RA. One way in which the RAs could be communicated to the BE200 pilot is via the Instantaneous Vertical Speed Indicator (IVSI). The simulated IVSI indications for the BE200 at the time of the RA alerts are shown below.


The simulated IVSI above shows that, at the time of the initial "Adjust Vertical Speed" RA, the BE200 was climbing at approximately 1600ft/min and that the RA required a negative vertical rate. By the time of the subsequent "DESCEND" RA the aircraft's RoC had increased to 2500ft/min, while the RA now required a rate of descent of not less than1500 ft/min.

The simulation indicates that as the BE200 climbed through FL150, where the Nimrod was in level flight, the RA changed again to a "MAINTAIN VERTICAL SPEED" RA instructing the pilot that the aircraft should maintain the current RoC. At the time of this RA the ac were horizontally separated by 2·4nm. The BE200 continued to climb and the RA weakened to an "ADJUST VERTICAL SPEED" RA instructing the BE200 pilot that the ac should not

descend. The simulation indicates that as the BE200 continued to climb through FL158 the crew was issued with "CLEAR OF CONFLICT".

The BE200 pilot filed a report stating that they received a "MONITOR VERTICAL SPEED" RA and reacted to it by increasing the rate of climb. The pilot's report did not mention any subsequent RAs.

It is possible that the initial TCAS RA might have been incorrectly simulated because of the way in which the SSR data is processed. Radar data regarding the flight path of an ac is available in roughly 6-second intervals. However, TCAS uses a 1-second update cycle based on SSR interrogations. To compensate for this disparity the simulator interpolates the time between consecutive radar points in order to gain a reasonable estimate of the flight path of the aircraft. This is a known limitation of the simulation process.

The pilot of the Nimrod filed a report stating that the ac was not TCAS equipped.

**HQ AIR OPS** comments that whilst this area of the country is in solid ScACC/ScATCC (Mil) radar coverage, such information is not available to the controller at Wick. In this instance, the Nimrod, level at F150 was instructed to maintain level, as the Wick controller was aware of climbing traffic below. However, notwithstanding the type of service the BE200 and the MORAY SC thought was being provided, the MORAY SC could have done more to keep the two ac apart.

## PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

In the light of the comprehensive ATSI report into this complex Airprox, the Board looked initially at the Wick APP controller's involvement. Members noted that although Wick APP accepted the Nimrod from ScATCC (Mil) ALLOC flying towards WIK and reportedly descending to FL150, without access to radar the controller would clearly have no knowledge whatsoever about other traffic in the vicinity or transiting through the Wick overhead on the ADRs. ATSI considered that Wick APP should have instructed ScATCC (Mil) to co-ordinate with the MORAY Sector before it was agreed that the Nimrod could be transferred to Wick. However, controller Members believed that any criticism of the Wick controller was a little unfair in his non-radar environment as APP had merely accepted the Nimrod for a PD into Wick at this stage and had not placed the flight under an ATS. Moreover, APP was hardly in a position to instruct ScATCC (Mil) to keep the Nimrod clear of the ADR. Although APP would have recognised that the Nimrod would enter the Class F ADRs – airspace under the control of MORAY SC - no position was given by the ASSISTANT ALLOC [who is not empowered to effect co-ordination] to the Wick controller, merely an estimate overhead the WIK and that the Nimrod was descending to FL150. Whilst APP had little time to arrange any co-ordination with the MORAY Sector before the Nimrod arrived at the WIK, over 3min ahead of its estimate, the controller did so as soon as he was able. Whilst the ATSI report had highlighted that Wick APP had not been able to forestall the conflict, controller Members emphasised that APP did not know the exact location of the Nimrod and was unaware of any potential conflict until contact was belatedly achieved with MORAY SC who astutely instructed the controller not to descend the Nimrod and to switch the flight to his Sector frequency.

With the ASSISTANT ALLOC apparently not aware that Wick ATC did not have radar, the ALLOC should have known and would also be aware that the MORAY SC was the controlling authority for this ADR. Wick APP had advised the ASSISTANT ALLOC "..*you put him to me when you're ready*" and it was not unreasonable for APP to expect the Nimrod to be transferred to them from ScATCC (Mil) either clear of confliction or with any essential traffic information already passed. Members did not believe that APP had to 'spell it out' for the ALLOC, especially when the ALLOC was providing a radar service to the Nimrod crew as it flew through the ADR: ALLOC was far better placed to assess any potential for a conflict than the 'procedural only' Wick APP controller. Accepting that there was little time to do so, Controller members believed that ALLOC might have contacted MORAY about the flight beforehand, which might have highlighted the conflict and enabled appropriate co-ordination to be effected. It was pointed out that ALLOC was under a high workload with exercise traffic recovering to Kinloss [the very same that had precluded the return of the Nimrod to Kinloss earlier]. Notwithstanding the caveat that under a RIS pilots are responsible for separation on other traffic, whether or not it has been called, Members agreed with the ScATCC (Mil) SUP's observation that it would have been prudent if ALLOC could have provided the Nimrod crew with traffic information about the BE200 before it was switched to Wick APP. Notwithstanding any perceived urgency to pass

the Nimrod over to the next ATSU in the midst of a busy traffic situation, the BE200 was plainly there to be seen on ALLOC's radar [he had last seen it climbing through FL92, according to the SUP's report] so it could have been called to the Nimrod crew under the RIS that pertained. This could have been accomplished before the Nimrod reached Wick but as it was ALLOC did none of this and merely transferred the Nimrod to Wick APP without notifying the crew of the confliction. That said, with the Nimrod crew IMC in between layers the potential for spotting the BE200 was reduced and Members questioned the wisdom of operating IFR under a RIS which is essentially a VFR radar service where aircrew are required to afford visual separation over reported traffic.

The overarching ATSs provided to the BE200 were discussed in some detail and it was clear to the DAP Advisor that the expanded advice within the ScACC SI was an improvement over previous arrangements. The Board was also briefed that following much consultation and review, forthcoming changes to ATSOCAS will bear fruit in the Spring of 2009 which will rationalise applicable ATSs for pilots and controllers who operate in Classes F and G airspace. The BE200 pilot apparently recognised the limitations of the ATAS provided by MORAY and had accepted this, insofar as traffic information would only be provided on non-participating flights such as the Nimrod here - but this might not be so plain to others, it seemed to Members. Whilst recognising the MORAY SC was acting with the best of intentions and that his priorities lay with the provision of traffic information to the BE200 crew, Members were dismayed at the delay here when Wick APP tried to co-ordinate with the MORAY SC who was trying fruitlessly to call the wrong ScATCC (Mil) controller at the same time. APP was not able to telephone the MORAY SC directly - a somewhat awkward arrangement – and a concern highlighted in the second of the two recommendations from ATSI which the Board endorsed. Several controller Members were of the view that a RAS, if provided here in 'advisory' airspace, could have forestalled the conflict, one Member opining that TCAS should only be seen as one of the final safety nets. The MORAY SC's retort of *"I'm gonna have to say avoid at your discretion"* when the BE200 pilot confirmed he had the Nimrod displayed to him on TCAS was somewhat disappointing to controller Members. Nevertheless, here a RIS was being provided and the Board could only assess Airprox on the basis of what had happened rather than what might have occurred in different circumstances. Civilian controller Members agreed that the MORAY SC had provided a satisfactory flow of traffic information during the encounter and it was plain the MORAY SC had subsequently endeavoured to stop the BE200 crew from climbing above FL140 when he learned from the information provided by Wick APP that the Nimrod was entering the Wick hold at FL150. It was clear that the SC's attempts to effect some vertical separation, thus going beyond the nominal requirements of a RIS, were thwarted by the BE200 crew's non-committal reply and then by their subsequent report of *"…we're just responding to TCAS"* which effectively prevented the SC from interceding further. The NATS Advisor expressed a concern here about the RT used by the BE200 pilot, which might have confused the MORAY SC, rather than use of the standard phraseology extant at the time. [An ATSIN and a FODCOM were issued by the CAA in May 2008 highlighting changes to TCAS/ACAS RA phraseology which were subsequently promulgated in Edition 17 of the RT Manual - CAP413 dated 21 Jul 2008 - for the benefit of civilian controllers and pilots respectively].

Whilst Members recognised that the Nimrod crew had legitimately requested the PD to Wick and had obtained a radar service en-route from the principal ATSU in the area providing a service to OAT, the short notice of their PD had given Wick APP little time to co-ordinate with the MORAY Sector before the Nimrod arrived at the WIK, over 3min ahead of its crew's estimate. A controller Member observed this was a salutary learning point for the Nimrod crew here, insofar as the time remaining to effect co-ordination with the civil ATSUs concerned was plainly not sufficient before the Nimrod arrived overhead the WIK. Whilst this no-notice PD to Wick was probably of good training value to the Nimrod crew, in this intense traffic scenario there was seemingly little time for ATC to make the necessary arrangements in a managed way beforehand. As it was, the Nimrod crew was instructed to switch to Wick APP unaware of the presence of the approaching BE200. Overall the Nimrod crew had little affect on the outcome of this Airprox. Whilst some Members questioned the Nimrod crew's airmanship in flying along the ADR towards the WIK, it was suggested that this was the appropriate entry into the hold. The Board was well aware of the status of ADRs and concerns raised in the past over interaction between participating GAT and non-participating flights in Class F airspace. ADRs are promulgated on RAF FLIP En-Route Charts and crews were thus well aware of their existence, especially those who operate regularly in this locale. However, the Board recognised that their classification as advisory Class F airspace did not compel military crews to participate in the advisory service whilst either crossing the route or flying in the vicinity, thereby making such traffic 'unknown' to the ADR controlling authority. Nonetheless, having been instructed to fly to Wick at FL150 and to call Wick APP the Nimrod crew were indeed complying with the ALLOC's instructions without question and CAT pilot Members believed quite reasonably so. The thrust of the first of the two ATSI recommendations that Wick, ScATCC (Mil), Lossiemouth and ScACC, review the joining procedures for flights from Class G airspace into Wick, bearing in mind that Wick is not radar equipped was sound and the Board endorsed this. However, whether it should be

mandated that co-ordination should take place before traffic can enter Class F airspace might be overly prescriptive and outwith the overall principles for Class F airspace.

It would have undoubtedly helped the Nimrod crew's situational awareness beforehand if they had been given traffic information before sending them en-route. It is plain that under a RIS, pilots are responsible for separation on other traffic, whether or not it has been called, so the Board stopped short of including this as a contributory factor to the Airprox. But the Nimrod crew reported flying IMC in between cloud layers: thus they might not have been able to obtain visual contact with the BE200 whether called or not. Therefore, without the benefit of either traffic information from ScATCC (Mil) or from any form of TCAS II which might have forewarned the Nimrod crew as to the presence of the BE200 approaching from the N, they commenced their entry into the hold oblivious to the traffic climbing up towards them. A military Member was very concerned at the absence of ACAS equipment in a large ac such as the Nimrod. Other large military ac are fitted with this important safety device and the Board observed that carriage of ACAS is mandatory in CAT of a similar size. If military ac engage in IFR operations at civilian airports – especially those without radar surveillance capability - then the Board agreed that there seemed little reason to exclude fitment from large military ac such as the Nimrod. Members were in no doubt about the quantum leap in flight safety that has accrued overall following the general acceptance and fitment of this extremely effective device worldwide. The circumstances of this close quarters situation in IMC might well have been altered significantly if the Nimrod had been fitted with TCAS II and so the Director was charged with writing to the MOD to lend the Board's full support to the fitment of ACAS to large military aircraft.

Turning to the BE200 pilot's report, it was evident that he was also IMC in the latter stage of the encounter as he climbed to the desired cruising level of FL155. Following advice from ScACC that he take his own avoiding action with traffic information provided by MORAY, the BE200 pilot monitored the other ac displayed to him on TCAS as it approached, thinking it would cross the ADR. The Nimrod should have been indicating above the BE200 and clearly displayed on TCAS to the latter's crew. No other traffic was shown in the vicinity on radar so it was evident that any second contact the BE200 crew might have observed was spurious. It was clear that the Nimrod crew's intention was ultimately to execute a descent in the WIK hold at some point when cleared to do so by Wick APP. However, recorded radar data showed that the Nimrod had remained within 100ft of FL150 on Mode C throughout during this close quarters situation. But MORAY had perceived at the time, erroneously, that the jet was descending when it was 10nm away from the BE200. Whilst the BE200 pilot's reported 45° R turn onto a heading of 240° suggested to some Members that he might have unwisely based his attempt to avoid the Nimrod on azimuth information from his TCAS display, this had been supplemented by traffic information from the MORAY SC. Unfortunately the radar data showed that this R turn by the BE200 was countered when the Nimrod turned L into the hold after it had passed the WIK. From this point TCAS took a hand and enunciated an RA of MONITOR VERTICAL SPEED, the BE200 pilot reports, inducing him then to increase his RoC. However, the NATS simulation, whilst illustrating that the BE200 pilot would indeed have received such an RA later, shows that this was presaged by two other RA's immediately following the TA at FL142 before the BE200 crew turned R. Firstly the "ADJUST VERTICAL SPEED" RA instructing the pilot that he should not climb as he passed FL144 and secondly, when this was not complied with, TCAS quickly elected to strengthen the RA to a "DESCEND" advisory at FL145, commanding the BE200 pilot to descend as his ac approached to within 500ft of the Nimrod's level. However, having disconnected the AP and increased his RoC and bank angle, with the other ac now actually turning towards the BE200, the radar recording shows the climb was maintained as the twin climbed through the jet's level at a range of 2nm. Thereafter, with the Nimrod now just below the BE200, TCAS sensed this and modified the resolution of the conflict advising the BE200 pilot to maintain the climb by enunciating to the pilot a MONITOR VERTICAL SPEED as he had reported. This RA subsequently weakened to a fourth RA - ADJUST VERTICAL SPEED - as the vertical separation increased. Thus it had been shown that there were 4 separate RAs in the short space of 21secs, the simulation showing that about 1min 3sec passed from the initial TA before CLEAR OF CONFLICT was enunciated. Notwithstanding that the simulation used interpolated radar data provided at a 6sec update rate compared to the 1sec update afforded TCAS, it seemed to the Members inconceivable that a TCAS II equipped ac climbing below another Mode C transponding ac [albeit non-TCAS] in level flight might have generated a CLIMB RA scenario. Highly experienced CAT pilot Members perceived that, in all probability, a cognitive error on the part of the BE200 crew had led them to increase the RoC to climb above the Nimrod whilst their instruments were telling them not to climb. [It was subsequently ascertained that the subject BE200 was fitted with a 'glass' cockpit and the RA indications displayed to the crew would have been similar to the IVSIs red/green bands replicated here.] A test pilot Member emphasised the overarching importance of visually confirming from the ac's instruments the 'vertical sense' of what the TCAS enunciations were demanding. The logic of the simulation seemed irrefutable to Members who, whilst recognising that there was no supporting recorded downlinked Mode S data, could see that to achieve such a profile the BE200 pilot had, in all probability,

misinterpreted his TCAS and climbed through the Nimrod's level when TCAS had earlier commanded him not to climb. The available information from the radar recording coupled with the TCAS data led the Board to conclude, unanimously, that this Airprox had resulted because contrary to the TCAS RA descend indications, the BE200 crew climbed into conflict with the Nimrod.

Members believed that this Airprox was inherently Risk bearing. Both crews were flying in IMC and neither actually saw the other's ac at all. Moreover, with the BE200 turning R towards the Nimrod and the latter in a L turn, both ac were placed in a 'belly-up' situation to one another. Thus despite the best endeavours of the MORAY SC to provide traffic information to enable the BE200 crew to sight the other ac, they did not do so as they climbed up through the Nimrod's level. Without the benefit of TCAS the Nimrod crew were oblivious to the presence of the BE200 until they were instructed to switch to the MORAY SC's frequency when it would have become apparent to them from the SC's traffic information [transmitted as the contacts merged] that the BE200 was some 600ft directly above them. The only remaining safety net for the BE200 crew was their TCAS, whose resolution of the conflict was thwarted initially by their persistence to climb above the other ac. This was enough to convince many pilot Members that there was, therefore, an actual risk of a collision. However, other Members believed that the horizontal separation of 2nm as the BE200 climbed through the Nimrod's level was enough to remove any actual risk of a collision. The resultant 600ft as the BE200 overflew the Nimrod was sufficient in their view, but others contended that this degree of vertical separation was purely fortuitous in the circumstances. The Board was very evenly divided on this aspect and so the Chairman elected to confirm the Board's view with a vote; by the narrowest of margins, the Board finally concluded that the safety of the ac involved here had been compromised but that an actual risk of a collision had not existed.

Following their investigation of this Airprox, ScACC had made a number of recommendations, action on which is in train. In light of this Airprox and other serious incidents, the Board was reassured to learn that NATS has set up a TCAS Working Group (WG), which had held its first meeting on 22nd July - the day before the UKAB met to assess this occurrence. Among the issues raised at the WG's discussion were inappropriate response to TCAS by pilots and controllers' actions following TCAS RA reports from crews. The Members were encouraged to hear that the WG will focus on training both for controllers and pilots.

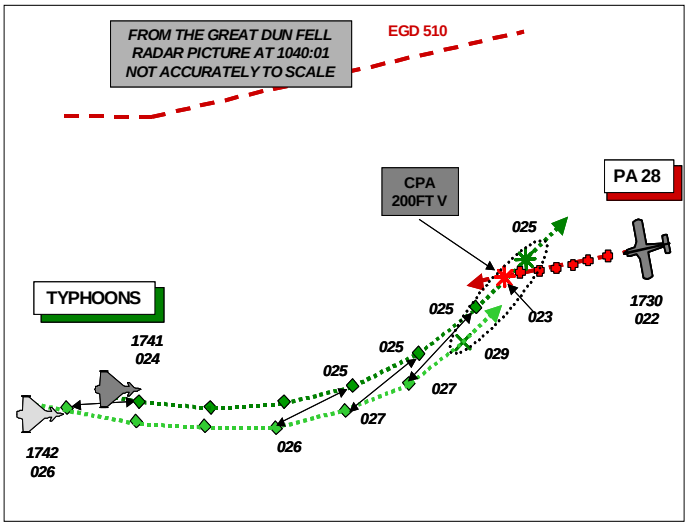
## PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Contrary to the TCAS RA descend indications, the BE200 crew climbed into conflict with the Nimrod.

Degree of Risk: B.

## AIRPROX REPORT NO 012/08

| | | |
|---|---|---|
| *Date/Time:* | 6 Feb 1039 | |
| *Position:* | 5456N 00224W(12nm E Carlisle) | |
| *Airspace:* | Scot FIR | (Class: G) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | Typhoon FGR4 | PA28 |
| *Operator:* | HQ AIR (Ops) | Civ Pte |
| *Alt/FL:* | 2380ft (RPS 1010mb) | 2500ft (1010mb) |
| *Weather* | VMC CAVOK | VMC CLBC |
| *Visibility:* | >10km | >10km |
| *Reported Separation:* | 200ft V/0m H | 300ft V/50m H |
| *Recorded Separation:* | 200ft V/ 0H (projected between sweeps but confirmed by leader's HUD recording) | |




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

**THE TYPHOON FGR4 PILOT** reports leading a formation of 2 Typhoons carrying out Forward Air Control (FAC) Training in Spadeadam Range under control of a ground based FAC operating concurrently on Spadeadam frequency. There was also an FAC helicopter in the area. During receipt of the target briefing while heading 084° at 331kt, Spadeadam ATC called a contact to them which was subsequently displayed on his ac system. The identified track appeared to pass behind his ac and was thus discounted by him as being a threat. Unfortunately, this track was not the conflicting ac that was called and they flew overhead the actual conflicting ac with minimal miss-distance and without being aware of its position.

(The ac mission tape was impounded by the Sqn for further analysis by the UKAB if required. The following is a transcript of the RT copied from the tape:

1038:15 SPADE Radar track BRA 098/06 (Pilot inserted into ac kit during Jackpot Tx)

1038:20 TYPHOON Can you confirm the Helicopter (CS) is airborne; I've got a radar track at 11 o'clock at 1000ft?

1038:32 SPADE Break, Break, this is Spadeadam, that traffic is working him, that is a VFR transit from Newcastle to Carlisle, will be at 2500ft, similar pressure (Radar track now passes formation)

1038:46 TYPHOON Apologies, say again

1038:47 SPADE This is Spadeadam ATC, that traffic that you're picking up is a PA28 working Spadeadam ATC transiting to Carlisle and back again. (Radar track now faded and assessed as being behind Typhoon formation). [See UKAB Note (1)]

1038:55 TYPHOON Copied.

(1039:54 HUD tape shows the light ac passing from right to left underneath Typhoon Leader at a distance subsequently assessed to be 200ft vertically and ZERO horizontally. Typhoon Leader can be seen to have been in a 30° AOB left turn with Typhoon 2 swept right at 0.9nm behind leader. The light ac passed down the left hand side of Typhoon 2 at about 1000ft separation).

**THE PA28 PILOT** reports flying in the RHS as a private VFR flight from Newcastle to Carlisle and return with the ac owner in the LHS. They were in a blue and white ac with the strobes switched on, squawking 7000 with Mode C and were in receipt of a FIS from Spadeadam Radar while heading 265° at 125kt tracking along the Tyne Valley

which lies 2nm to the S of the Spadeadam Range boundary. The Spadeadam Controller informed them of 2 Typhoons approaching from the SW at about the same level and shortly after this the 2 ac were spotted ½nm away flying on a conflicting track. No avoiding action was taken as, due to the early warning by the Spadeadam Controller, it was clear that the military ac would overfly them, provided they maintained their altitude and track, which they did. What did surprise him was the absence of any wake turbulence, considering the proximity of the 2 ac. He was informed after that the Typhoon pilot had filed an Airprox. He assessed the risk as being high.

**SATCO** at RAF Spadeadam reports that a limited RIS was being provided to a pair of Typhoons which had booked a 1-hour slot in the range to carry out FAC training. This involved receiving targeting instructions, initially from a Gazelle helicopter at 3000ft but later in the sortie, when this incident occurred, from a ground-based FAC utilizing a Spadeadam frequency. Just before the incident, control of the ac had been given to another controller whilst he attended to a phone call. On his return some 5min later, the Gazelle had landed and the Typhoons had been cleared to operate from SFC-17000ft, had been warned of their responsibility for terrain separation and given a RIS limited since they were flying close to the base of radar cover. He then resumed control of the ac. Newcastle ATC had warned him earlier of a light ac transiting from Newcastle to Carlisle and back at 2500ft and asked if he wished it to work him as they had range activity. Having initially not taken the light ac, he changed his mind as the Typhoons decided to make a further run with another FAC, so he contacted Newcastle who duly handed the light ac over to him.

The light ac pilot contacted him on the VHF frequency, was identified, assigned a squawk, placed under a FIS, given the Tyne Pressure of 1010mbs and he confirmed the altitude for his transit was 2500ft. A few minutes later, having repositioned outside the range boundary, the Typhoons were SW of the range by about 10nm in a left hand turn to position to the E of the range and commence their run. He was monitoring the FAC frequency as the FAC was delivering a comprehensive brief when a Typhoon asked him (the FAC) if the Gazelle was airborne again as he had a "radar contact in his 11 o'clock at 1000ft". At that time the PA28 was approx 10-12nm in the 11 o'clock of the formation [and closing at 7½ nm per min]. At this point he stepped in on the FAC frequency and advised Radar that the traffic was a light ac under his control on VHF transiting from Newcastle to Carlisle at 2500ft 1010mb. Having earlier been on a Tyne Pressure of 1008mbs, he also advised the Typhoon to adjust to 1010mb which was read-back and acknowledged. He then selected VHF and passed TI to the PA28. Upon seeing the formation close on the PA28 he asked the PA28 pilot if he was visual to which he advised that he was. About 10sec later Typhoon 1 pilot advised that he had just had an Airprox with a "stranger inside the range" that he was "at 2000ft and it passed below" him and was knocking off the run to RTB Leeming. The PA28 was outside the range at all times and indicating above 2000ft throughout the transit from Newcastle.

The Typhoons were climbed to 10000ft and the transit to Leeming was uneventful. He advised the pilot of the PA28 that an Airprox had been called and to contact him on landing which he did. The PA28 pilot advised him that he was happy with the events that took place and that following the initial TI he saw the Typhoons and observed them flying above him by a quoted " 3 or 400ft". The pilot of a Typhoon contacted him and advised that he believed the separation to be no more than 100ft.

**MIL ACC** reports that a pair of Typhoons from RAF Leeming was conducting a FAC exercise within or close to Spadeadam Range. A military Gazelle had been operating in the range as part of the exercise but was on the ground at the time of the reported Airprox. At the time of the Airprox the formation was receiving target instructions from the FAC and was turning left onto heading 084°, in level flight at 2380ft on the RPS 1010mb in good VMC, out of the sun. Typhoon 1 was squawking 1741 with Mode C and No2 was squawking 1742 also with Mode C and the ac were properly booked into the UKLFS. Meanwhile a PA28 was conducting a private flight from Newcastle to overhead Carlisle and back to Newcastle.

The Typhoons were working under the control of a ground-based FAC for the exercise, but were also receiving a RIS from Spadeadam Radar (RADAR) on (a separate frequency) 282.05MHz. This service was limited due to base of radar cover. The PA28 was receiving a FIS from RADAR on 128.725MHz and the frequencies were not cross-coupled. The RADAR Controller reported a low workload. Three different radars were selected to give greater situational awareness since the Typhoons were operating between the surface and 17000ft.

At 1034:17, RADAR responded to the PA28 pilot's initial call by saying *'identified on a FIS, Tyne pressure 1010, say again your altitude?,* the pilot responded immediately with *'1010 we are now 2500ft on 1019'* and RADAR continued saying *'PA28 C/S and just confirm it will be overhead Carlisle and then back to Newcastle?'*, which he confirmed. About 2min later Typhoon Leader asked the FAC *'just confirm your helicopter is airborne, I've got a*

*radar track left 11 o'clock now at err 1000ft'*. At this point, RADAR, who had been monitoring the FAC frequency, stepped in saying *'Break, break this is {RADAR} and err for Typhoon C/S that traffic is working me that's a VHF transit from Newcastle to Carlisle indicating 2500ft similar pressure.'* Typhoon Leader did not hear the transmission properly and, thinking that the FAC was talking to him said *'Apologies FAC C/S, say again' and* at 1036:57, RADAR repeated the warning saying *'This is {RADAR} that contact you are picking up is a PA28 working {RADAR} transiting to Carlisle and back again'*. Typhoon Leader thanked RADAR for the information and was given the new Tyne pressure of 1010mb, which is acknowledged. (Between 1037:18 and 1038:12 [see UKAB Note (1) regarding timings] the FAC was briefing Typhoon Leader on the FAC frequency). At 1037:31, RADAR called the PA28 pilot and, after getting a response, said *'PA28 C/S, I've got err two Typhoon aircraft south west of you by four miles indicating similar altitudes keep a good look out' and* the pilot replied *'PA28 C/S copied and looking'*. RADAR continued *'Roger and they've got a radar contact on your position'*, which was acknowledged. Twenty sec later RADAR asked the PA28 pilot *'are you visual with those fast jets' and* he replied *'affirm'*. Immediately after this, Typhoon Leader transmitted *'Terminate, terminate, standby'*. At 1038:16, Typhoon Leader informed RADAR *'{RADAR} stranger in the range ……..(2 sec pause)…… our position heading west'*. The pilot then instructed his No2 to climb to 5000'. After exchanging callsigns, Typhoon Leader told RADAR at 1038:39 *'I've just had an Airprox with an aircraft at err, I was at 2000 feet he was below me, we are terminating the exercise and RTB Leeming'*.

The R/T transmissions and the radar replay could not be matched up due to a large discrepancy in the timings. Therefore, analysis of the Great Dun Fell (GDF) radar is limited to showing the relative positions of the ac just before and just after the point of the reported Airprox.

It is considered that there were no Mil ATC causal factors relating to this Airprox because, under a RIS or a FIS (respectively), the pilots were responsible for separation on other traffic, whether or not it has been called. RADAR gave timely TI to both the Typhoons and the PA28, giving all concerned a better chance of seeing and avoiding the other ac. There was however, one Mil ATC contributory factor relating to this incident: namely not repeating the altitude of the PA28 on second transmission to the Typhoon pilot at 1036:57 thus possibly reducing his (their) SA.

UKAB Note (1): The discrepancy between the timings on the Spadeadam RT and the GDF radar recording made the sequence of events difficult to determine. It was however assumed that the latter was accurate and the timings herein are based on that datum. The radar recording shows the Typhoons complete an attack on a NW track at about 1036:55 and enter a slow left turn onto ESE while rejoining. As they roll out on ESE at 1038:20 the PA28 is in their 11 o'clock at exactly 10nm and at 2000ft amsl. This is about 2min after the Spadeadam Controller first passed the TI to the Typhoons regarding the PA28 and it is assumed to be the time that the Typhoon Leader asked the FAC if the helicopter was airborne (see also Typhoon HUD RT tape) as he had a radar contact, and the Spadeadam Controller stepped on him to pass further TI. It is most likely that the radar contact that the Typhoon Leader had was actually the PA28 concerned (the helicopter was not airborne and the GDF shows no other contacts within 20nm). The ac then close at 450kt (7½nm/per min) until 1040.01, the time of the CPA. The Typhoons initially cross the PA28's track from its 1o'clock to its 1130 but then turn left slightly to conflict effectively head-on. Typhoon Leader indicates about 200ft above the PA28 throughout as they close. The CPA is about 4nm S of the Southern boundary of D510 in LFA 13.

**HQ AIR (OPS)** comments that nobody did anything wrong in this incident, and the PA28 was visual with the Typhoons and content that they would pass clear of him. FAC missions are extremely busy and complex activities. The Typhoon pilots were in a very busy phase of the exercise copying the details for the next attack from the FAC. Indeed, the Spadeadam controller was aware of this as he was monitoring the frequency and broke into the FAC's transmission to pass TI. However, I do not believe that the pilots appreciated that the PA28 was going to be a factor and were surprised that it came so close to them. The first transmission from RADAR was not copied, and the subsequent transmission did not include any height information.

## PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

A Board Member who was familiar with operations at Spadeadam briefed the Board that GA ac frequently fly the route that was being flown by the PA28 using the A69 as a reference and are almost always directed by Newcastle or Carlisle to call Spadeadam if their range is active. Further, she informed the Board that military activity often stretches outside the Danger Area boundary into the associated dedicated LFA, as was the case with the Typhoons.

The Board was also briefed that a Combat Air Support sortie, particularly in single seat ac, is a very high work load activity and in particular the writing down of target details is a most intensive task that must be accomplished by all pilots in the formation simultaneously and that was most likely why the Typhoons were at 2500ft rather than lower. Further, the Typhoon and the pilots at the time of the incident were just commencing air-to-ground operations and had relatively little experience of that type of flying. That being the case, one civilian Member suggested that high workload parts of the activity where lookout might be degraded would better be conducted within the limited protection afforded by the Danger Area, even if the limited size of the Area means that the whole activity cannot be flown therein. Another very experienced professional pilot suggested that the indications were that the Typhoon pilots' workload had been such that they might have become saturated and knocking off the exercise and returning to base had been wise.

No Board Members, including a current fighter Test Pilot, could offer any explanation as to why the Typhoon 'kit' had apparently 'dumped' the PA28 and not displayed it as a threat when patently it had been, as witnessed by the HUD recording (visual) and the GDF radar recording. Further, Members were completely satisfied that there had only been one other ac in the exercise area at the time and that had been the PA28 concerned, which had painted on the GDF radar throughout.

Despite distractions, the Spadeadam Controller had provided good TI to the pilots of both ac on more than one occasion. This TI had enabled the PA28 pilot to see the Typhoon and, although Members were sympathetic with his situation considering the closing speed, it had been too late for him to make any meaningful lateral avoidance. A GA pilot Member noted that this is often the case and when flying a light ac at relatively low speed and seeing a fighter closing quickly, even from a distance, there is a tendency to trust the fighter pilot to avoid you, as any avoidance that you might take would have only a very limited effect.

Since the Typhoon pilots had not seen the PA28 until they passed it Members agreed that there had been an erosion of normal safety standards; however since the PA28 pilot had seen the Typhoons and was content that they were not a significant problem, there was no actual risk of a collision.

## PART C: ASSESSMENT OF CAUSE AND RISK

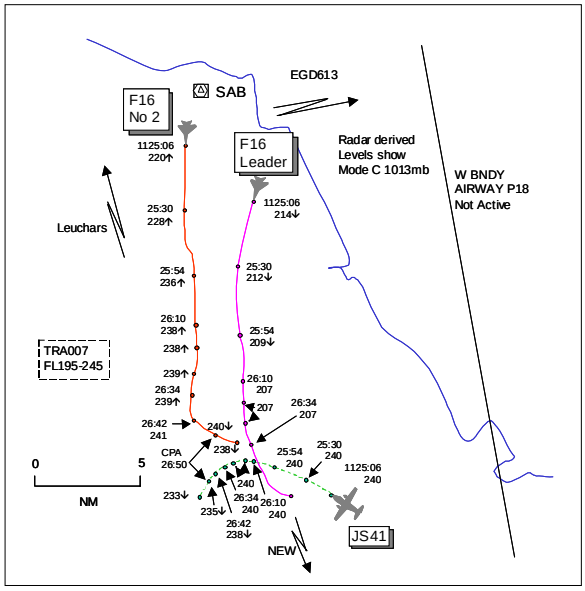
Cause: A non-sighting by the Typhoon pilots and a late sighting by the PA28 pilots.

Degree of Risk: B.

## AIRPROX REPORT No 013/08

## AIRPROX REPORT NO 013/08

| | | |
|---|---|---|
| *Date/Time:* | 7 Feb 1127 | |
| *Position:* | 5537N 00210W (17nm S SAB) | |
| *Airspace:* | TRA007 | (Class: C) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | JS41 | F16x2 |
| *Operator:* | CAT | Foreign Mil |
| *Alt/FL:* | FL240 | max FL240 |
| *Weather* | VMC CLAC | VMC CLOC |
| *Visibility:* | >50km | >10km |
| *Reported Separation:* | | |
| | Nil V/NR H | 2000ft V/2nm H |
| *Recorded Separation:* | | |
| | v Leader 3300ft V/1·6nm H | |
| | v No 2 500ft V/2·3nm H | |




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

**THE JS41 PILOT** reports inbound to Aberdeen IFR at FL240 and 285kt and in receipt of a RAS from Scottish Mil on 124·05MHz squawking 4635 with Modes C and S. The visibility was >50km flying 10000ft above cloud in VMC and the ac was coloured white/blue with nav and strobe lights switched on. They were advised of fast moving military traffic in their proximity and although they were in good VMC nothing was seen. Various calls from ATC were received, all were hesitant with no clear instruction, and eventually they were told to 'standby'. Moments later a call was received *"JS41 c/s turn L 270° for avoiding action"* followed immediately by *"JS41 c/s turn L 090° avoiding action"*. During the L turn a TCAS RA 'descend, descend now' was triggered, demanding ROD 2000fpm, which they executed immediately. ATC was informed immediately, the ac subsequently levelled-off at FL230 and continued to Aberdeen via PTH. The other ac was not seen visually but its flight path was varying greatly at a very high rate with vertical separation estimated to be nil but horizontal separation was not known. He assessed the risk as very high.

**THE F16x2 LEAD PILOT** reports compiling his report from memory 3wk post-incident without benefit of recorded data. He was scheduled on a 4+4 v 4 mission in the OTA Echo and at the time their formation were on CAP in the Southern part of the area. About 53nm S of Leuchars Boulmer reported a civil airliner approaching from the SE and they were given a top (capped) altitude of 24000ft, giving at least 3000ft vertical separation [he thought]. Heading 140° at 300kt they first saw the airliner on radar at range 10nm and later picked it up visually, a low wing twin turboprop type coloured white. They maintained vertical separation under VFR 'see and avoid' and steered more towards the SE to allow the airliner to pass to their R, separation was 2000ft vertically and 2nm horizontally at the CPA. They continued their mission without any further issues, assessing that there had been no danger during the incident. He opined that his formation was operating under 'see and avoid' regulations and this is not deconflicted with IFR traffic flying with TCAS.

UKAB Note (1): The formation leader was contacted later by the Secretariat to clarify his wingman's perspective of the incident. The Leader confirmed that his wingman was displaced both vertically and laterally, the leader descending to avoid the JS41 whilst the wingman climbed to 24000ft before turning away from the JS41 whilst following the leader.

**THE ScATCC MIL CONSOLE 2 CONTROLLER** reports acting as a screen controller when taking over the console with a trainee. The off-going controller handed over 2 civil ac (same company) on similar tracks 50nm and 30nm NW of NEW both under a RAS, AC3 at FL185 and the subject JS41 at FL240. Also a Nimrod was operating S of D613 complex at FL95 on a FIS. To the NE of the 2 civil ac were multiple fast jets manoeuvring over the sea between SL and FL660 working Boulmer showing various levels. The off-going controller told her that Boulmer had a major exercise on and that the ac would not be entering OTA E but would be remaining over

the sea. Therefore, both civil ac were positioned 10nm overland to parallel the coast. Just as they were about to take over the position AC3, was given avoiding action onto 270° to avoid tracks [the subject F16s] which were tracking S towards it. She asked the trainee if he was happy to take the traffic and at this point they took over the position. She told the trainee to turn the JS41 onto 290° to de-conflict with the fast jet traffic [subject F16s] which were 25nm to the N tracking S. The next few transmissions by the trainee were incomplete as he was giving avoiding action and TI to the wrong ac [subject JS41]. She intervened and the trainee corrected himself and offered correct avoiding action to AC3 to maintain heading as the traffic was in its 5 o'clock at 7nm FL210 descending. As the conflicting ac [F16s] continued to track S over land it climbed and then became a confliction with JS41. Avoiding action was offered by the trainee at 15nm, the flight was turned L onto 250° and the crew reported seeing the confliction on TCAS. The conflicting ac then manoeuvred closer and was continuing to climb so further avoiding action was given at 8nm, turning the JS41 L onto 090° and the crew reported 'TCAS descent'. The conflicting traffic then began to track E so the JS41 flight was given further avoiding action, turn R onto 270°. Both AC3 and the JS41 then became clear of the traffic and were given vectors towards the TMA. At this stage she and her trainee discussed obtaining airways joining clearances to get both ac to join CAS at FINDO and limiting the type of service owing to traffic density.

**THE BOULMER WEAPONS CONTROLLER 5** reports the exercise involved 2 forces, 1 aiming to simulate bombing Spadeadam whilst the other force attempted to prevent this occurring. In the Air Tasking Order (ATO) operating levels were briefed as SFC to FL660 within D613C and not above FL245 outside, unless cleared higher by Boulmer; the flights were not cleared higher. She had previously worked on similar sorties throughout the preceding week so she knew that when the ac were in position and called 'fights on', the tempo of the sortie would be high and remain so. Also, she believed that the crews would not want to coordinate, as this would be detrimental to the mission. Therefore she called the ScATCC Mil Allocator, possibly the assistant, before 'fights on' and gave them TI for all controllers to the effect that there would be a large package of ac on various Boulmer squawks (she thought the squawks were passed at the time) and that they would be pushing W into OTA E from D613C not above FL245 or its equivalent RPS. She also suggested that if they had any RAS civil transits, they should push them into the upper air. After the initial 'fight' within D613C, the attacking force [including the F16s] pushed W into OTA E and it was at this point that all ac were reminded to manoeuvre not above 24000ft on the Orkney RPS of 1006mb outside the confines of D613C. Whilst in OTA E the F16s held whilst some of the other ac routed to Spadeadam. She noticed 2 ac wearing ScATCC Mil squawks of 4624 [AC3] and 4625 [JS41] passing NEW N'bound and she monitored these tracks and saw them depart the link route in a W'ly direction tracking towards the F16s. The 4625 track [the subject JS41] caused her concern, being co-level with her F16s, as it did not appear to be taking any course of action to avoid her traffic. She called its position, heading and level to her flights and, in addition, told the pilots that the traffic was IFR (an assumption based on experience) as they were foreign and unfamiliar with the airspace. At no time did ScATCC Mil pass any TI to her but she felt that it would be safe to assume that their ac were civil. After monitoring civil ac's progress she updated the TI to the F16 pilots and stressed that the traffic was a TCAS equipped ac, again an assumption. The final call she made was that the traffic was co-level on the nose at which point they called visual.

**MIL ACC** reports that the day of the Airprox was the 3rd day of a busy military exercise taking place in Operational Training Area (OTA) Echo and the East/Central MDA region [within Temporary Reserved Area TRA007].

An ACN was not issued due to the late notification of the activity by the sponsoring squadron to AUS. However, 2 NOTAMs had been issued fully detailing the activity and airspace involved.

H0169/08 NOTAM valid 0802051030 till 0802071800 for activity 5th-7th 1030-1230 and 1530-1800. Exercise Dutch Tartan up to 16 fast jet ac, many in formation, will conduct high energy manoeuvres and may not comply with Rules of the Air within area bounded by 5612N00329W – 5641N00200W – 5600N00100W – 5500N00100W – 5500N00300W – ORIGIN (Operational Training Area E – Northumberland and the Borders). SFC – FL240.

H0170/08 NOTAM valid 0802051030 till 0802081800 for activity 5th-7th 1030-1230 and 1530-1800. Exercise Dutch Tartan Intense aerial activity within and below EGD613A-C (Central MDA). Up to 16 fast jet ac, many in formation, will conduct high-energy manoeuvres and may not comply with rules of the Air. SFC-FL100.

In addition the JS41 Airline Operations had been informed by ScATCC Mil [on the 1st day of the exercise, i.e. 2 days prior to but not on the day of the incident] that the area would be very busy and a recommendation that their ac remain within the airways structure was made. [Airway P18 was not available for use].

## AIRPROX REPORT No 013/08

Approximately 1hr before the Airprox, Boulmer Weapons Controller 5 (WC5) informed the ScATCC Mil Assistant Allocator that the Exercise would be taking place between 1100Z and 1200Z. He also advised them that participating ac would not be in the Upper Air, operating outside active Danger Areas and that it would be best for transits in receipt of a RAS to avoid exercise traffic by flying in the Upper Air. However, ScATCC Mil controllers were apparently not informed of the full exercise details passed by Boulmer to the ScATCC Mil Assistant Allocator.

At the time of the Airprox, ScATCC Mil Controller 2 had 3 ac on frequency: the subject JS41, another ac from the same company (AC3), both receiving a RAS and a Nimrod which the controller was trying to transfer to the ScATCC Allocator on a FIS. Shortly before the Airprox, the ScATCC Mil Controller 2 position was handed over to a U/T Controller supervised by a screen.

The Boulmer controller was providing a RIS to 15 participating exercise ac. Despite the high number of units on the frequency, she, supported by a Supervisor, was operating within her capability. Immediately prior to the incident the civil traffic was called a total of 5 times to the pilots concerned and they had called visual.

At 1117:40 the JS41 crew called ScATCC Mil Controller 2 (Cont 2) reporting at FL240. The ac was identified, placed under Radar Control and given own navigation direct to ADN. Cont 2 established that a RAS was required outside of CAS. Between 1118:23 and 1119:14 there was a landline conversation between Boulmer Assistant 6 (Boulmer) and ScATCC Mil Assistant 2 (Asst 2). The initial landline exchanges were cut off by the R/T recording but it is clear that Boulmer was informing Asst 2 that the Military Exercise was about to commence. Danger Area 613C would be 'hot' and the [exercise] ac would be "coming out of the airway". During this exchange, the pilot of AC3 contacted Cont 2 requesting a RAS en route Aberdeen at FL185; Cont 2 identified the ac and placed it under RAS. At 1119:05, Asst 2 asked Boulmer "*What level are they climbing to?"* Boulmer replied "*Err, the height block sea level to FL660".* At 1119:15 Cont 2 interjected on the landline and asked "*Are they [exercise ac] going to be maintaining feet wet or are they coming over land over OTA E as well?"*. Boulmer replied "*we believe feet wet".* At 1119:38, Cont 2 informed the pilot of AC3 "*There is a major exercise just off the coast of St Abbs involving probably about 10 or more ac at all levels. I'll navigate you towards Leuchars initially and that should keep you clear if you remain over land".* The pilot acknowledged the information and was given own navigation Leuchars. At 1120:08 Cont 2 asked the JS41 flight "*…do you copy that?"* to which the crew replied "*…err, yeah copy that".* The full details passed to the AC3 crew were not repeated. The JS41 flight was then given own navigation Leuchars.

Between 1121:00 and 1123:32, in order to manage personnel over the lunch period, the ScATCC Mil Allocator, via Asst 2 told Cont 2 to try and get the Nimrod to transfer to the Allocator on a FIS. The Nimrod pilot attempted to call UHF without success and returned to the Cont 2 frequency. The Nimrod pilot was then instructed to try VHF. At 1123:40 Cont 2 issued avoiding action to AC3 flight "*…avoiding action, turn left heading 270, traffic right 1 o'clock 10 miles, reciprocal, indicating FL165"* he acknowledged at 1123:50 and complied with the instruction. At 1124:00 Cont 2 handed over the control position to a U/T and screen controller. During the handover, the oncoming screen controller was informed that Boulmer had a major exercise on and that they had informed him that the ac would not be entering OTA E but would be remaining over the sea. Immediately after taking over the control position (1124:14), the screen controller, via the U/T, instructed the JS41 flight to "*…for separation against traffic operating north by 20 miles, turn left heading 290"* which the crew acknowledged. The next 4 transmissions, between 1124:20 and 1124:32, involved the Nimrod flight informing the controller that they could not raise anyone on VHF and was told to stand by. At 1125:04 Cont 2 U/T began to give avoiding action and TI to the JS41 flight but the instruction was incomplete and given to the wrong ac [4 truncated and separate transmissions were made lasting 30sec and should have been addressed to AC3]. The screen controller intervened and gave the correct instruction to AC3 as "*AC3 c/s maintain heading previously reported traffic now right 5 o'clock, 7 miles, crossing right to left, indicating FL210 descending".* At 1125:50 the U/T controller took over control and immediately gave avoiding action to the JS41 flight "...*avoiding action, turn left heading 250. Traffic right 1 o'clock, 15 miles, crossing right to left, indicating FL235 climbing".* The pilot acknowledged the call taking the turn and informed Cont 2 that the conflicting ac was on TCAS. At 1126:25 further avoiding action was given to the JS41 flight "*turn left heading 090, previously reported traffic now right 2 o'clock, 5 miles, crossing right to left indicating FL240 climbing".* At 1126:35 the JS41 crew stated to Cont 2 "*TCAS descent".* The next transmission was from the Nimrod crew with a request and they were told to standby. Cont 2 gave further avoiding action to the JS41 flight at 1127:00 "*…further avoiding action, turn right heading 270 previously reported traffic now north east 5 miles tracking east indicating FL235"*; the crew took the turn. It is considered by Command that the Cont 2 screen did not intervene in a timely manner which led to the U/T providing late avoiding action to the JS41 which, combined with poor RT and phraseology, was insufficient to resolve the confliction.

Meanwhile, Boulmer WC5 was calling both AC3 and the JS41 tracks to the fighters using the controller's experience to opine that the ac were IFR and TCAS equipped.

[UKAB Note (2): At 1123:03 Boulmer WC5 broadcast the position of AC3 and then the JS41 as *"Boulmer group [AC3] bullseye 095/09 19 thousand friendly N'bound, additional group [JS41] 125/17 24 thousand friendly N'bound"*. Just over 1min later at 1125:07 the F16 leader transmitted *"Boulmer confirm that's group 120/09 24 thousand"* to which the controller replied *"negative group bullseye 010/06 19 thousand friendly TCAS equipped ac"*. The F16 leader then called *"F16 c/s and declare 120/08 24 thousand spades"*, Boulmer WC5 replying *"Boulmer friendly skip it"* which was acknowledged at 1125:28 with F16 Leader c/s and an unintelligible word.]

At 1126:16 approaching the CPA, Boulmer WC5 reported *"…F16 No2 c/s friendly BRAA 170/08 westbound IFR TCAS equipped ac 24 thousand".* Another exercise ac pilot asked if the transmission was for him, Boulmer WC5 reiterated that it was F16 No2 and at 1126:37, the controller called the JS41 to the conflicting F16 *"F16 No2 c/s friendly nose co level"* to which both F16 Leader and No2 replied, in turn, *"visual".*

[UKAB Note (3): The Claxby radar recording clearly captures the evolution of the encounter. At 1125:06, when the F16 Leader queries the JS41's presence with WC5, the JS41 is seen tracking NW'ly level at FL240 with the F16 Leader in its 0130 position range 14·4nm tracking 190° descending through FL214 with the F16 No2 in the Leader's 4 o'clock, displaced by 3·5nm, climbing through FL220. The F16 leader continues in a slow descent and rolls out on a S'ly track whilst the No 2 continues its climb remaining in its formation position. By 1125:54 as the Cont 2 U/T issues an avoiding action turn onto 250° to the JS41 flight, the F16 Leader has closed to a range of 6·4 nm indicating FL209 descending, >3000ft below the JS41. However F16 No 2 is now separated from the JS41 by 9·8nm and is seen climbing through FL236. Two radar sweeps later at 1126:10 the JS41's L turn is seen to commence with the F16 Leader now level at FL207 in the JS41's 0230 position range 3·9nm whilst the F16 No 2 is indicating FL238 having closed to range 7·1nm from the JS41. When the JS41 crew call 'TCAS descent' at 1126:35 and just before WC5 passes updated TI to F16 No2, F16 Leader is passing 1·6nm behind and 3300ft below it, the 1st CPA, whilst F16 No 2 is in the JS41's 3 o'clock range 3·7nm showing FL239, 100ft below. The next sweep 8sec later shows F16 No2 peaking at FL241 and commencing a L turn away from the JS41, which is descending through FL238, with a horizontal separation of 2·7nm. The 2nd CPA occurs on the next sweep at 1126:50, the JS41 now turning through heading 210° indicating FL235 descending with F16 No 2 turning sharply through a SE'ly heading descending through FL240 separated by 500ft/2·3nm.]

ScATCC Cont 2 then vectored AC3 back en route shortly followed by the JS41 who continued at FL230 [after the TCAS descent]. At 1128:38 Cont 2 informed AC3 and JS41 flights "*you are currently flying in an area of high traffic intensity, standard separation may not be achieved"*. In response, the JS41 crew asked if he could climb to FL250 and was informed that a joining clearance for the Tay sector was being negotiated. Cont 2 went on to say that "*the traffic we're trying to keep you away from is operating up to FL660…".* Both AC3 and JS41 flights were given own navigation and transferred to Scottish Control at 1133:06 at which point the JS41 crew informed Cont 2 that he would have to file the TCAS descent.

## 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 Boulmer WC5: she had shown a very good understanding of the situation, based on her previous experience, in particular the operational features of an airliner such as the JS41. The ASACS Advisor informed Members that the information concerning the exercise ac remaining 'feet wet' had been offered to ScATCC Mil Cont 2 by the Boulmer Assistant 6, whose controller would have been working other ac involved in the exercise on a different frequency. This information had undoubtedly led Cont 2 to believe that keeping AC3 and the JS41 overland, parallel to the coast, would avoid the exercise ac. However, it should have been evident from the NOTAMs that the exercise area included OTA E and that the exercise ac could conflict with any other traffic transiting through TRA007. This was confirmed when the WC5 passed detailed exercise information during her conversation with the ScATCC Mil Assistant Allocator an hour before the incident but unfortunately this information was not passed on to the ScATCC Mil Controllers. Members agreed that had the Cont 2 been a party to WC5's suggestion that transit ac should be encouraged to fly in the Upper Air, the potential for confliction would have been easily removed. Members questioned the Cont 2 screen's rationale for taking over the position when the off-going controller had just given avoiding action to AC3, with the JS41 also in potential confliction, and then

allowing the U/T to take control. The U/T then gave TI to the JS41 crew on the F16s 20nm away and a L turn onto 290° 'for separation'. Following a short RT exchange with the Nimrod flight, the screen had then allowed the U/T to try and pass avoiding action to AC3 but he had erroneously used the JS41 c/s with 4 incomplete instructions, before she intervened. These transmissions had taken up over 30sec of valuable 'air time' before AC3's situation was correctly addressed by the screen, further delaying any action needed with the subject JS41 as the F16s closed on it from the N. Members agreed that the Cont 2 screen should have taken over control at an early stage in an attempt to resolve the deteriorating situation. One controller Member opined that the subsequent TI and avoiding action given by the U/T (L onto 250°) was, by that late stage, going to be ineffective and that, because of the speed differential between the subject ac, it was always going to difficult for the Cont 2 team to achieve the requisite separation even if positive action had been taken from the outset. Looking at the geometry, another Member opined that a R turn onto N might have been a better option earlier but as the Cont 2 was under the misunderstanding that the exercise ac would be turning L and remaining over the sea, the initial L turn issued to the JS41 flight was understandable. That said, no attempt had been made to coordinate with WC5, which Members agreed might also have led to easier resolution of the situation.

Meanwhile, WC5 had given good TI to the F16 formation pilots who had seen the JS41 on radar at about 15nm range with the Leader descending and passing >3000ft below and 1·6nm behind the JS41. However, it was clear to the Board that the F16 No2 pilot had, during his tactical flying in formation with his leader, climbed up towards the JS41's cruising level. After receiving updated TI regarding the JS41, both the Leader and No2 reported visual, the radar showing No2 already turning L, with both F16 pilots taking visual separation on the JS41, unbeknown to the latter's crew. Members agreed that although the F16 No2 pilot was happy with the separation, his chosen flightpath had triggered a TCAS RA in the JS41 and this had caused the Airprox to be reported. From the JS41 crew's viewpoint, they were understandably concerned as they had received initially a turn onto 290° for separation then erroneous incomplete avoiding action instructions followed by a L turn onto 270° and then another turn onto 090°. As the JS41 turned L, TCAS gave an RA descend, which was actioned immediately but the crew were unable to visually acquire the 'conflicting traffic'. Although the separation margins were eroded, the Cont 2 team had tried to give avoiding action based initially on erroneous information and then tactically, albeit later than ideal, as the event unfolded. Taking all of these elements into account, the Board agreed that the visual sightings and manoeuvres flown by the F16 formation pilots had ensured that any risk of collision had been removed.

## PART C: ASSESSMENT OF CAUSE AND RISK

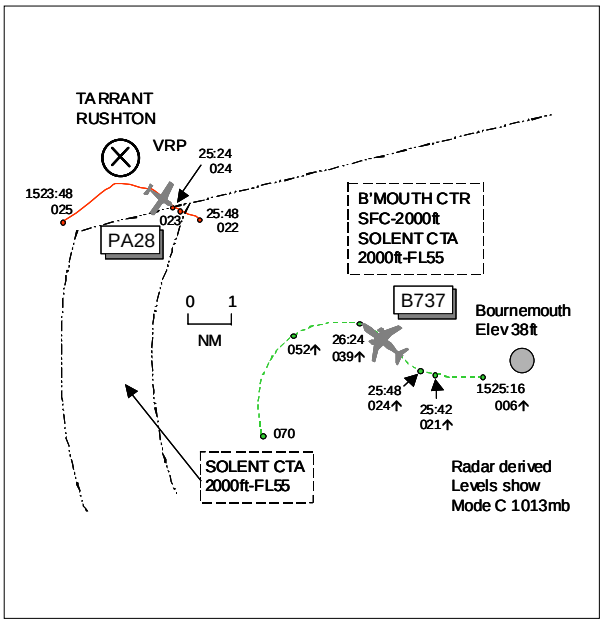
Cause: The F16 No2 pilot's chosen flightpath triggered a TCAS RA in the JS41.

Degree of Risk: C.

**Post Meeting Note.** On receipt of the final Report into this Airprox, the JS41 Operator advised that the Company was fully aware of Exercise Dutch Tartan and had been in daily, sometimes hourly, contact with Scottish Military as to the impact it would have on the Company's operations. When advised that Company aircraft should route via the airways structure, this was immediately implemented, a procedure which the Company follows during any military exercise. On the day in question, approximately one hour after this Airprox, Scottish Military advised the Operator to use the Airways structure which they did.

# AIRPROX REPORT NO 014/08

| | | |
|---|---|---|
| *Date/Time:* | 6 Feb 1526 | |
| *Position:* | 5048N 00157W (4nm NW Bournemouth - elev 38ft) | |
| *Airspace:* | Solent CTA | (Class: D) |
| *Reporter:* | Bournemouth Radar | |
| | *1st Ac* | *2nd Ac* |
| *Type:* | B737-800 | PA28 |
| *Operator:* | CAT | Civ Trg |
| *Alt/FL:* | ↑FL070 | ↓1500ft (QNH) |
| *Weather* | VMC NR | VMC CAVOK |
| *Visibility:* | | >10km |
| *Reported Separation:* | | |
| | Not seen | Not seen |
| *Recorded Separation:* | | |
| | NR | |




## PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

**THE BOURNEMOUTH RADAR CONTROLLER** reports that avoiding action was passed to the B737 flight to resolve a confliction with an unknown radar return squawking 7000 indicating A30 which was making an unauthorised penetration of CAS. This unknown ac was later identified by the ADC as the subject PA28.

**THE B737 PILOT** reports on initial climb-out following a departure clearance from RW26. As soon as they changed frequency to Radar they were instructed to 'turn L immediately L heading 030° for traffic avoidance on an unidentified ac'. They complied with the instruction and during the turn they received no TCAS or any other warnings; the weather was VMC.

**THE PA28 PILOT** reports flying as a student pilot on his first solo cross-country flight routeing Bournemouth, Tarrant Rushton, Gillingham, Dorchester, Tarrant Rushton and then Bournemouth. He flew this route with an instructor the previous week, the only difference being Tarrant Rushton to Gillingham and not Shaftesbury previously flown. He was aware of the Bournemouth Radar (119·475MHz) and Tower (125·6MHz) frequencies and these were programmed into the radio set. Prior to taxi he changed to Ground as requested and once airborne he set frequency 119·475MHz before changing to Compton Abbas 122·7MHz when O/H. He reverted to 119·475MHz after this. Just prior to Tarrant Rushton, flying at 3000ft heading 120° at 100kt, he attempted to call Radar several times but with no response. He was descending to 1500ft en-route to Bournemouth and still without a response so he changed to Tower which brought a response. By this point he was within CAS where the max level is 2000ft, he thought. He realises now that he should have orbited prior to entering whilst awaiting permission. His radio worked correctly thereafter and he could not explain why he was unable to establish contact with Radar. He did not see the B737 during the incident.

**ATSI** reports that the PA28 flight was cleared for take-off from RW26 at Bournemouth, with a R turn out, at 1444. The pilot, subsequently, at 1446, reported approaching 1500ft and was transferred to the Bournemouth Radar frequency. Although the pilot read back the frequency correctly, no communication from the flight was recorded on that frequency. The Radar Controller, aware of the PA28's departure, passed information about traffic believed to be in its vicinity at 1454. Further calls were made to the flight; at 1501 to request its position and level; at 1502 and 1503 to try and establish contact but no replies were received.

The B737 flight was cleared for take-off RW26, with a R turn out, at 1523:50. The flight had received a departure clearance routeing via SAM and NORRY, climbing to FL70. The radar recording at this time shows an ac squawking 7000, with Mode C FL025 (equivalent to 3000ft QNH 1030mb), tracking NE, just outside the NW boundary of the Solent CTA (Class D airspace, 2000ft-FL55). This was, subsequently, identified as the subject

PA28. The B737 crew was instructed to transfer to the radar frequency at 1525:27, just as the PA28 at FL024 (2900ft QNH) unverified entered the NW corner of the Solent CTA/Bournemouth CTR. (CTA 2000ft-FL55, CTR SFC-2000ft, both Class D airspace). As soon as the B737 pilot read back the frequency the ADC transmitted *"just before you go if you turn left heading one seven zero degrees"*. Presumably the pilot had already transferred as he did not reply. Meanwhile, the radar controller had noted the presence of the unknown ac and transmitted on the Approach frequency *"Aircraft one mile southeast of Tarrant Rushton at three thousand feet report your level correction report your callsign"*. No response was received. Shortly afterwards, at 1525:38, the B737 flight established communication, reporting passing 2800ft climbing to FL70 towards SAM. The controller replied *"B737 c/s Bournemouth Radar avoiding action turn left heading zero three zero degrees unknown traffic northwest of you four miles three thousand feet southeastbound"*. The pilot responded to the L turn and reported passing FL37. TI on the unknown was updated, just after 1526:20, as 2·5nm NW SE'bound descending. The pilot reported having the traffic on ACAS.

Approximately 1min later, the PA28 pilot called on the Tower frequency for rejoin. No response was received and 1min later the pilot transmitted again. The ADC asked the pilot to confirm that the aircraft was NW of the airfield at 1400ft, joining RH downwind. This was confirmed and the pilot was instructed to continue downwind. The flight was, subsequently, cleared to land RW26 at 1532.

The PA28 pilot entered Class D airspace without a clearance. As soon as it was apparent that the ac had unexpectedly entered CAS, ATC took appropriate action, as soon as possible, to control the situation.

The radar recordings do not show the PA28 after 1525:48, when it is just within the NW corner of CAS at FL022 (2700ft QNH). The B737 is passing FL024 (2900ft QNH) at the same time.

## PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members could add little to this Airprox, sympathising with the student's predicament on his first solo cross-country when faced with his return to Bournemouth but unable to make contact with Radar to obtain joining clearance. It was thought strange that although the PA28 student believed he had twice set the correct Approach frequency, once when airborne and again after leaving the Compton Abbas area, the Radar controller had made several transmissions to him whilst outbound without establishing 2-way contact and no RT calls were received on the radar frequency from the student whilst inbound. With there being no other apparent radio problems at the time and thereafter, Members thought that this had more likely been a frequency selection problem rather than any other cause. As the student stated in his report, with hindsight he should have remained clear of CAS whilst awaiting permission but instead he had continued towards Bounemouth and flown into CAS without clearance which had caused the Airprox.

Members commended the actions taken by the Radar controller as he had monitored the PA28's track and given prompt avoiding action and TI to the B737 flight when the CAS penetration occurred. The B737 crew had reacted swiftly and reported having a TCAS contact but no TA or RA warnings were received. The turn reversal given and the B737's fairly rapid climb through the PA28's level had led to a quick and effective resolution of the confliction which the Board agreed had removed any risk of collision.

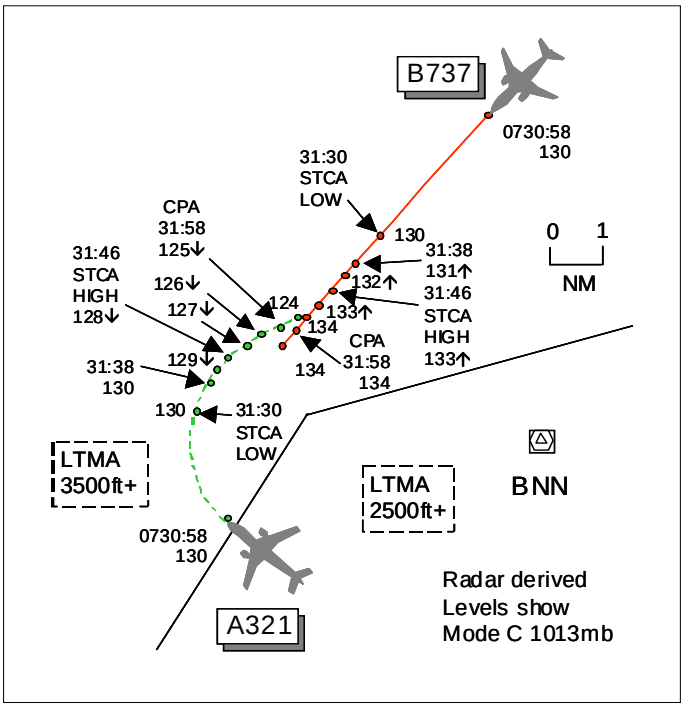
## PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The PA28 student pilot entered CAS without an ATC clearance.

Degree of Risk: C.

## AIRPROX REPORT NO 015/08

| | | |
|---|---|---|
| *Date/Time:* | 5 Jan 0732 (Saturday) (TWIL) | |
| *Position:* | 5146N 00041W (5nm NW BNN) | |
| *Airspace:* | LTMA | (Class: A) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | A321 | B737-800 |
| *Operator:* | CAT | CAT |
| *Alt/FL:* | FL130 | FL130 |
| *Weather* | VMC CLOC | VMC CLOC |
| *Visibility:* | >10km | 5000m |
| *Reported Separation:* | 700ft V/3nm H | 300ft V/2·5nm H |
| *Recorded Separation:* | 900ft V/0·3nm H | |




**BOTH PILOTS FILED**

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

**THE A321 PILOT** reports inbound to Heathrow IFR in the hold at BNN at FL130 and 220kt and in receipt of a RCS from London squawking with Mode C. Turning inbound they received a TA on traffic 6nm away which quickly generated an RA 'descend' as they proceeded along the inbound leg: the TCAS guidance was followed. The other ac was seen to be the subject B737, which climbed to avoid them, and was estimated to pass 700ft above and 3nm clear, he thought. He assessed the risk as high.

**THE B737 PILOT** reports outbound from Stansted IFR heading 225° at 300kt and FL130 and in receipt of a RCS from London squawking with Mode C. They received a TA at range 5nm then an RA 'climb' which was followed, the traffic passing 300ft vertically below and 2·5nm clear, he thought. Once clear of conflict they descended to maintain FL130. He assessed the risk as high.

**THE LTC NW DEPS** reports taking a handover at 0725Z at which point the B737 (Stansted CPT departure) was on radar heading of approx 260° climbing to FL130. The ac was being climbed beneath a Solent departure, an EMB145, climbing to FL140. The BNN stack for Heathrow was up to FL130 with the subject A321 being the highest in the stack. At about 0727 the B737 was turned onto heading 225° in order to turn it inside the EMB145 with the intention of climbing the B737 to FL160 in accordance with the standing agreement. However, as further traffic called on frequency inbound to BNN, he forgot to climb the B737 which was now heading towards the BNN stack as the A321 was beginning a turn inbound. The A321 crew called 'TCAS descent' at approximately 0728, he thought, and proceeded to descend to FL124 before climbing back to FL130 once the conflict was resolved. The B737 crew called 'TCAS climb' and this was acknowledged.

**ATSI** reports that at the time of the Airprox, both flights were in communication with the TC BNN/NW Deps controller. The controller described his workload as moderate whilst the traffic loading was moderate to high. He described this loading as fairly typical for the time of day.

The investigation was hindered, to some degree, when it was discovered that the time injection for the radar, RT and desk side were all different. Enquiries showed that the radar timings appeared to be accurate whilst the RT

was 30sec fast and the desk side was 23sec fast. This has been pointed out to the unit for them to take remedial action. Timings in this report have been adjusted accordingly to remove any timing errors.

The A321 flight established contact with the TC controller (controller 'A') at 0721:30, and the pilot reported descending to FL150 heading 145°, which was acknowledged. At 0723:36, the controller instructed the A321 flight to descend to FL140 and for the crew to resume their own navigation to BNN and be prepared to hold for some 15–20min. The crew were then instructed to reduce to holding speed. Meanwhile, the B737 had taken off from Stansted following a CPT 3R departure. This requires the ac to climb straight ahead to 3·1 DME and then turn R and track N to the BKY VOR. A L turn is then made towards WCO (track BKY 262 radial).

The crew of the B737 called the TC controller at 0724:55, when it was just S of BKY, and reported climbing to FL80. The controller instructed the crew to fly a heading of 260°. Approximately 1min later the controller instructed the A321 flight to descend to FL130. A handover of the position took place and a new controller (controller 'B') took control. One of his first transmissions, timed at 0726:35, was to the crew of the B737 with an instruction to climb to FL130. At this time the A321 was descending through FL136 and had crossed from R to L through the 12 o'clock position of the B737 at a range of 24nm.

The hold at BNN was busy and when the A321 crossed overhead the VOR, at 0728:05, the ac joined the stack at FL130. At this time the B737 was in the 9 o'clock position of the A321 at a range of 17·4nm. At 0729:30, the new TC controller instructed the crew of the B737 to turn L heading 225°, which was acknowledged. At this point the A321 was turning R onto the outbound leg of the hold and was still maintaining FL130. The two ac were now converging and both maintaining FL130. At 0731:35, as the A321 was in the R turn to intercept the inbound track to BNN, STCA activated between the two ac and shortly afterwards (0731:40), as the ac were on near reciprocal tracks at a range of 3·7nm, the crew of the B737 reported a TCAS climb whilst the A321's crew reported a TCAS descent. As the two ac continued towards each other, vertical separation started to increase whilst lateral decreased. When they were 2·3nm apart the vertical separation was only 500ft and when the lateral separation was 1·6nm the vertical was 600ft. The ac passed each other starboard-to-starboard, at 0731:58, with a lateral separation of 0·3nm and a vertical separation of 900ft.

Controller 'B' advised that this was his first session of the morning on TC BNN/TC NW Deps. He had been given a comprehensive handover by the outgoing controller and was aware of both the subject ac. He described the traffic situation and loading as being fairly typical for that time of the morning. When asked, he stated that CPT departures from Stansted were becoming very common and, in his view, they were one of the more tricky ones to deal with. The normal manner of handling such departures was to take them from BKY on a W'ly heading which would keep them to the N of the BNN hold. He was aware that traffic was holding at BNN up to FL130 and he had the 'stack windows facility' selected and displayed in the top L corner of his radar display. (*ATSI note: The stack windows display will show the levels of aircraft in the hold. It will also display any aircraft passing through the holding area if this has been targeted. However, in this case the B737 was vectored into the hold and so it would not have been displayed in the facility*). On his strip display he had a BNN strip for the A321 and 2 strips, one for BKY and the other for WCO for the B737.

On this occasion there was traffic, an EMB145 from Southampton routeing to Manchester, which was maintaining FL140 and routeing via CPT. It had been agreed, prior to controller 'B' taking the position, that the EMB145 would be transferred from TC South directly to TC Midlands. Controller 'B' was fully aware of this ac and had been provided with a fps. His plan was to route the B737 to the E of Compton, thereby avoiding the EMB145 and to climb it to FL160, the transfer level, so that it would pass over the BNN hold. Although his strips were correctly marked, he did not move the B737 WCO strip to the BNN bay in order to highlight any potential conflictions. He added that it was not his normal practice to do so.

Controller 'B' recalled checking the holding traffic at BNN when he instructed the crew of the B737 to turn L onto 225° and he intended to issue the climb clearance once he had seen the turn take effect. At the time there was a batch of inbound ac approaching his sector from the N and some of these needed to be coordinated above the standing agreed level due to the holding situation. Although the Coordinator was engaged in this it did take some of controller 'B's attention. Several of these flights then called, as well as 2 departures; one from Luton and one from Stansted. This distracted him resulting in him not issuing the planned climb clearance.

He first became aware of the conflict when a colleague shouted across the room to him. He recalled seeing STCA activate, a quick flash of white (low severity) and then almost immediately to red (high severity), before the crews

announced their TCAS RAs. He was somewhat shocked by the situation and he believed this is why he did not pass any TI to the crews. The A321 descended to FL124, in response to the RA and separation was lost against other traffic holding at FL120, which was following the A321 around the hold 3·5nm behind. Controller 'B' reported that he was aware of this confliction but considered his main priority was to restore the holding situation with the A321 back at FL130.

Once the two ac had passed, the crews reported climbing back to their assigned levels. Shortly afterwards controller 'B' instructed the crew of the B737 to climb to FL160 and then transferred them to the next sector.

## 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.

An ATCO Member familiar with LTC operations opined that NW Deps plan had been sound but he had made a basic mistake by forgetting to climb the B737. Shortly after turning the B737 L to pass E of the EMB145, with the intention of climbing the outbound B737, he had interrupted this process to then deal with other sector business. A classic 'aide memoir' used by controllers in such circumstances is to 'cock-out' the appropriate fps so that it is obvious that an action was outstanding for the relevant flight. This was not done nor did he move the B737 WCO fps into the BNN fps bay either. Another Member noted the position was bandboxed and asked whether this could have contributed to the incident. With the traffic loading medium to high, the ATCO Member said that the decision to split was ultimately down to the Sector Controller, after consultation with the Supervisor, and in his experience with 20min holding taking place the sector would normally be split but this varied somewhat between different Watches and individual controllers. The NATS Advisor opined that the controller had rated the workload as medium and that it was normal for the Traffic Manager to assess the situation using the Traffic Load Prediction Device (TLPD) and fpss, then liaise with the Supervisor and Sector Controller to agree on a course of action. In this case it was thought that NW Deps was comfortable with the scenario, having elected not to work the EMB145, which normally would be when busy. The ATSI advisor commented that there were gaps in the RT between traffic calling NW Deps when he could have given the B737 flight a climb, insofar as this indicated the Sector was not too busy with the RT loading not continuous. At the end of the day, Members agreed the cause of the Airprox was that NW Deps had vectored the B737 towards the BNN hold and into conflict with the A321.

The NW Deps controller had been alerted to the conflict by a colleague just before STCA activated at first low, then high severity. About the same time both crews had received TCAS TAs then complementary RAs, the A321 to descend and the B737 to climb, and the crews' reactions to these RAs were broadcast over the RT. The A321 and B737 crews had reacted promptly to their TCAS commands and had very quickly established 500ft vertical separation as the ac closed to 2·3nm apart before eventually passing with 0·3nm horizontal and 900ft vertical separation. The crews' actions were enough to allow the Board to conclude that any risk of collision had been quickly and effectively removed.

## PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The LTC NW Deps controller vectored the B737 towards the BNN hold and into conflict with the A321.

Degree of Risk: C.

## AIRPROX REPORT No 016/08

## AIRPROX REPORT NO 016/08

*Date/Time:* 11 Feb 1532

*Position:* 5128N 00027W (London/Heathrow Airport - elev 83ft)

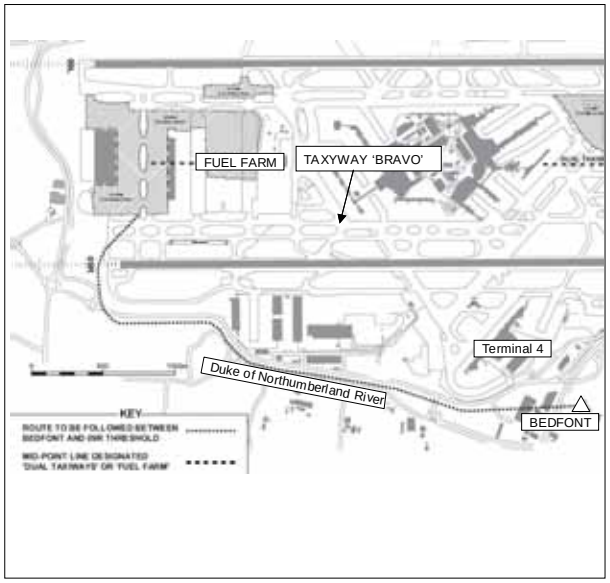
| | | |
|---|---|---|
| *Airspace:* | Heathrow ATZ | (Class: A) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | A321 | Enstrom 480B |
| *Operator:* | CAT | Civ Pte |
| *Alt/FL:* | Take-off↑ | 800ft |
| | QNH | QNH (1032mb) |
| *Weather* | VMC Ovc | VMC In haze |
| *Visibility:* | 10km | 10km |

*Reported Separation:*

400ft V/200-300m H 800ft V/500m H

*Recorded Separation:*

Not recorded (~300yd H)




Also see diagram at page 72

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

**THE A321 PILOT** reports that his ac was lined up on RW09R at London/Heathrow ready for a BPK5J SID outbound for Copenhagen under IFR, in VMC, and in communication with TOWER on 118·7MHz. The crew was aware of helicopter traffic to the S of the RW, in the vicinity of Terminal 4, and the TCAS display indicated the helicopter was 400ft above them. With traffic information that the helicopter would remain to S and W, TOWER issued their take off clearance. The Captain was the PF and so was looking inside the cockpit with the 1st Officer PNF looking forward along the runway. Whilst their A321 was on the RW the helicopter moved to the N side of RW09R, the 1st Officer only spotting the helicopter visually as it started to cross RW09R creating a hazard as they took-off. The helicopter passed abeam some 200-300m to port at a height of 400ft agl - by then flying W parallel to RW09R on a reciprocal course - as his A321 was still on the RW about to take-off heading 092° at 155kt. No avoiding action was taken. The risk was assessed as *"high".*

**THE ENSTROM 480B HELICOPTER PILOT** provided a very frank account reporting that he was in transit from Shoreham to Denham in his black & silver helicopter. HISLs were on. In communication with TOWER on 118·7MHz, squawking the assigned code of A7035 with Mode C, he was flying through the CTR on helicopter route H9 to cross Heathrow airport under Special VFR in VMC at an altitude of 800ft London QNH (1032mb)

He cannot remember the exact RT instruction that was given to him but, for whatever reason, he believed at the time [erroneously] that he was cleared to fly direct from BEDFONT RP to the FUEL FARM RP. Seeing the Airbus A321 lined up at the end of RW09R about 1000m away, before crossing he made sure that there was not an ac rolling on the RW. He crossed RW09R by taking the shortest route on a perpendicular track and after crossing the RW turned L to take a route to the FUEL FARM in the centre of and parallel to the RW's. The Airbus only started its take-off roll after he had crossed, when he was approximately half way down RW09R, westbound at 60kt. The risk was assessed as *"low".* In hindsight, he understands fully that it would have been highly unusual to be cleared across RW09R without there being a specific instruction.

Formal training on the helicopter Routes and Heathrow crossing procedures was conducted in 2004 with an instructor. Additionally, he had refresher training with an instructor, including a Heathrow crossing, in May 2007. Whilst very familiar with the crossing procedure when the westerly RW's are in use, this was the first occasion that he had crossed when the easterly RW's were active. It is clear that he misunderstood the procedure. The 2008 copy of Pooleys and the latest edition of the helicopter routes map were aboard but he was unable to consult the detailed crossing procedures en-route as he was flying solo. He opined that, in hindsight, when he was informed that it was an easterly RW in use he should have asked the controller for precise instructions.

**THE AIR NORTH ARRIVALS 09L (AIR 09L ARR)** controller reports that she was mentor to a trainee. The Enstrom was "warned-in" by Special VFR to cross the Airport S to N and that the pilot would call them approaching BEDFONT RP. On first RT contact the Enstrom pilot was instructed to hold at BEDFONT. The trainee then instructed the Enstrom pilot to "follow the Duke of Northumberland River, pass to the west of the 09R threshold and hold at the FUEL FARM" which she thought, the pilot read back accurately. Their attention was then directed to the ac on the runway and subsequently to the next 'lander'. Turning around to check where the helicopter was, it seemed the Enstrom was a little close to the southern runway – 09R. Air South DEPARTURES 09R (AIR 09R DEPS) said she was not happy with where the helicopter was, just as the AIR 09L ARR mentor asked the Enstrom pilot to confirm he was following the Duke of Northumberland River as the helicopter appeared to be to the N of it. The pilot replied that he was and that he was routeing to the FUEL FARM. When holding over the FUEL FARM the Enstrom pilot actually routed very close to the VCR and had to be asked to return to holding over the FUEL FARM. It was also reiterated that the hold should be N of RW09R and S of RW09L at all times. The subject A321 - once airborne - informed AIR 09R DEPS that the helicopter was at an altitude of 400ft and passed very close to them when they were just airborne. Visual observations from the VCR appeared to indicate to her that the helicopter could have been flying above the runway.

**THE AIR SOUTH DEPARTURES 09R (AIR 09R DEPS)** controller reports that she had been given prior warning by Special VFR of the helicopter crossing the airport from S to N. "A southbound check" up to the point where the helicopter arrived at BEDFONT had been applied. AIR 09L ARR had also warned her of the crossing helicopter and notified her that the Enstrom was progressing via the Duke of Northumberland River S and W of RW09R. Just as she thought the helicopter had turned westbound at BEDFONT, she cleared the A321 crew for take-off, having passed traffic information on the helicopter, telling the crew it would pass "south and west of the runway". The A321 was watched rolling down RW09R and as the ac rotated, she noticed the helicopter appeared to be closer to the runway than it should have been. From the VCR it was difficult to tell exactly where the helicopter was in relation to RW09R but it appeared to be somewhat N of the river. The helicopter's position was pointed out to AIR 09L ARR and she heard them transmit to the helicopter pilot about his position. Once the A321 was airborne and climbing away, she asked the pilot about the relative position of the helicopter as he took-off. The A321 pilot told her that the helicopter had been N of 09R at an altitude of about 400ft as he departed. Some minutes later, the driver of an Operations vehicle called on the frequency to say that he had been on taxyway BRAVO SOUTH at the time of the incident and that the helicopter had passed overhead.

**ATSI** reports that Heathrow was operating easterlies with arrivals to RW09L and departures from RW09R. The AIR 09L ARR position was being operated by a mentor and a relatively inexperienced trainee. At 1523, the LTCC Special VFR Controller telephoned AIR 09L ARR to co-ordinate the transit of the Enstrom helicopter across the airport from S to N from Helicopter Route H9. The trainee was advised of its squawk – A7035 (to allow it to be tracked on the ATM) and that it would hold S of BEDFONT RP. Due to a number of departure routeings i.e. CPT; MAY; MID and SAM SIDs not being separated from traffic on H9, a southbound check was placed on departures. AIR 09L ARR was informed, at 1524, that the Enstrom was at Oxshott, routeing northbound up H9. The Enstrom pilot established communication with the AIR 09L ARR controller at 1528, reporting its squawk – A7035. The Enstrom pilot was instructed to hold at BEDFONT RP and was passed the surface wind of 090°/6kt. Reporting at BEDFONT about 2min later, the hold instruction was repeated by the AIR 09L ARR controller. At 1531:50, the Enstrom pilot was instructed to "[C/S] *route the Duke of Northumberland River to the west of the 0-9 threshold right and hold at the FUEL FARM"*. The Duke of Northumberland River runs along the southern side of the airport, S of RW09R and the perimeter road, until it turns N to pass to the W of the RW09R threshold. The Fuel Farm is situated E of Terminal 5 in between RW09L and 09R. The pilot read back the clearance *"Hold at the Fuel Farm"* but no mention was made about the routeing before that point. Neither the mentor nor the trainee challenged the pilot's incomplete readback.

Meanwhile, the subject A321 had been cleared to line up on RW09R by AIR 09R DEPS who was aware of the Enstrom's cleared routeing. At 1531:52, traffic information and take off clearance was issued to the A321 crew*"…traffic information there'll be helicopter traffic routeing south and west of the airfield you're cleared for take-off 0-9 right surface wind 0-8-0 degrees 10 knots"*. The pilot reported *"Cleared take-off 0-9 right visual with the helicopter traffic* [C/S]" just after 1532:00. The AIR 09R DEPS controller commented that the helicopter was turning westbound at BEDFONT at the time. As the A321 rotated on the RW, it appeared to this controller that the helicopter was closer to the runway than intended and the AIR 09L ARR Controller was alerted. The latter had just turned round to check the helicopter's position. The mentor then transmitted to the Enstrom pilot *"and* [C/S] *just to confirm that you are following the Duke of Northumberland River you appear to be north of it at the moment"*.

## AIRPROX REPORT No 016/08

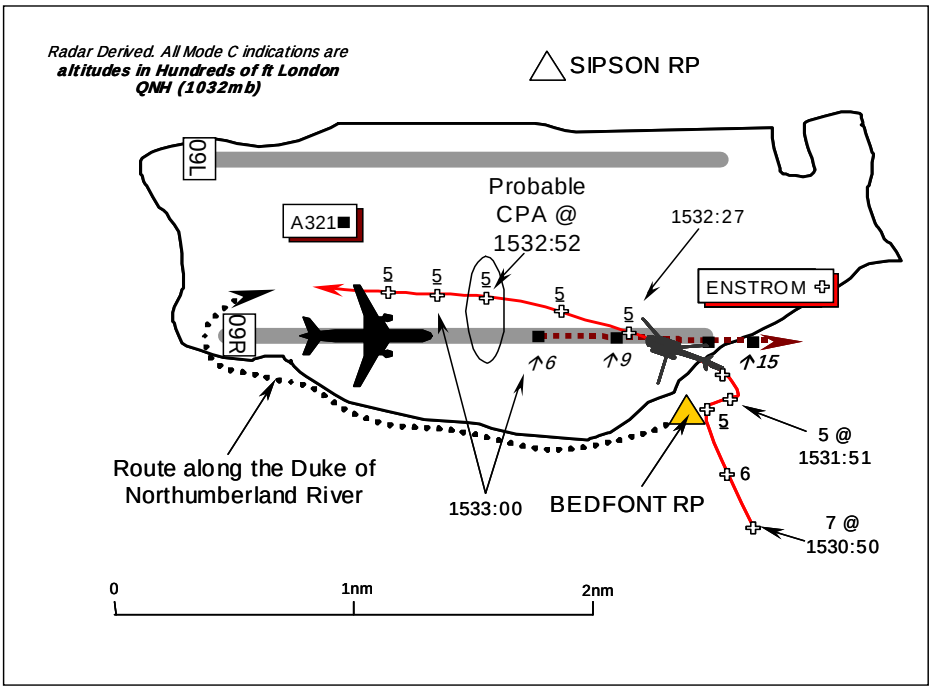
The pilot replied *"er roger just heading for the FUEL FARM now* [C/S]*"* and the instruction to hold at the FUEL FARM RP was repeated.

After the incident, following a query from ATC whether the helicopter had passed to the right or left of his ac, the A321 pilot commented *"I wondered whether to have a word with you about that he was on the north side of the runway at 4 hundred feet with separation less than a quarter of a mile"*. Additionally, the driver of an Operations vehicle reported that whilst he was on Taxiway Bravo, the helicopter had flown overhead. Taxiway Bravo is approximately 1000ft N of the centreline of RW09R.

The UK AIP, at AD 2-EGLL-1-23, states the flight procedures for helicopters crossing 09L/09R. This includes the routeing 'FELTHAM-BEDFONT-Duke of Northumberland River-West of RW09R threshold-FUEL FARM-(direct, or as instructed by ATC)-SIPSON and vice versa'. Also, 'Helicopters are to transit the airport at not less than 800ft Heathrow QNH. Additionally, a map is promulgated at AD 2-EGLL-4-1, showing the routeing via the Duke of Northumberland River.

Neither the AIR 09L ARR Controller mentor nor the trainee challenged the Enstrom's pilot about his incomplete readback of the transmitted transit instructions. Nevertheless, the clearance was issued clearly and followed the standard routeing for helicopters transiting Heathrow during easterly operations. It is understood that local NATS Management are reviewing the easterly operations crossing procedures for helicopters.

UKAB Note (1): The Heathrow 10cm radar recording does not illustrate this Airprox clearly as the A321 is understandably not shown until airborne. The Enstrom helicopter is shown approaching the vicinity of BEDFONT Reporting Point following H9 in a slow descent through 700ft London QNH (1032mb). Thereafter the helicopter levelled at 500ft London QNH – about 417ft aal - which is maintained throughout the encounter as the Enstrom pilot holds at BEDFONT reducing speed to a radar GS of <20kt. After 1531:51, the moment that both the A321 crew was cleared for take-off and the Enstrom pilot was instructed to "…*route the Duke of Northumberland River to the west of the 0-9 right threshold…"*, the helicopter is shown turning L to steady WNW'ly. Crossing RW09R at about 1532:27, indicating 500ft QNH at a radar GS of 85kt, the Enstrom steadies on a westerly course displaced some 300yd to the N of RW09R at 1532:52 which is probably when the CPA occurred as the ac passed port–to-port during the A321's take-off. The airliner is not shown for a further two sweeps until it climbs into coverage through 600ft QNH the first contact being shown at 1533:00, by which time the Enstrom is drawing astern into the airliner's 7 o'clock at a range of ½nm a radar GS of >90kt.



UKAB Note (2): The UK AIP at AD 2-EGLL-1-7 notifies the London Heathrow ATZ as a radius of 2½nm centred on RW09L/27R, extending from the surface to 2000ft above the airport elevation of 83ft amsl.

UKAB Note (3): The 1520UTC Heathrow weather was sfc wind 080/07kt; CAVOK; QNH 1032mb NOSIG.

## PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board noted the concise report from ATSI which, coupled with the RT transcript, had allowed the essential facts of this Airprox to be made plain. It was clear that the Enstrom pilot had been issued with an appropriate clearance which, if it had been followed correctly, would have ensured that no conflict resulted between the helicopter and the A321 during the critical stages of the latter's take-off and departure from RW09R. When the Enstrom pilot had been told by the AIR 09L ARR trainee controller to "…*route the Duke of Northumberland River to the west of the 0-9 threshold right*" it was clear that he had not absorbed this instruction fully. However, a key issue here was the incomplete readback by the Enstrom pilot. With hindsight, it was readily apparent that the Enstrom pilot's short reply of *"hold at the FUEL FARM"* illustrated that he had not correctly absorbed what he was being told. Controller Members recognised immediately that the AIR 09L ARR control team should undoubtedly have challenged this incomplete readback at the time, but evidently they did not. The busy traffic scenario, plus the additional weight of instructional duties perhaps, had apparently prevented the AIR 09L ARR Mentor from recognising the Enstrom pilot's omission. If she had been aware of this, Members believed that the AIR 09L ARR Mentor would undoubtedly have questioned this incomplete readback which from her report she evidently thought at the time was correct. Thus the Mentor had not prompted her trainee to recheck the helicopter pilot's understanding of what he was required to do. It was plain to Members that this unchallenged incomplete readback was part of the cause.

It was clear that the Enstrom pilot's transit altitude was significantly lower than that prescribed and helicopter pilot Members were of the view that pre-flight planning and briefing were factors here. Whilst the trainee controller's instruction was transmitted clearly enough, pilot Members believed that the Enstrom pilot's unfamiliarity with Heathrow Special VFR procedures and routeings had also played a part here. From his very frank and honest account it was also clear that he had not flown through the Heathrow CTR before, when Easterly operations were taking place.

The A321 crew had no hand in the cause whatsoever, but after leaving the hold at BEDFONT, the inexperienced Enstrom pilot flew on toward the FUEL FARM in the mistaken belief that he had been cleared to cross RW09R when, unbeknownst to him, the A321 crew had been cleared for take-off. Members recognised that this non-compliance with ATC instructions was the result of unfamiliarity and inexperience rather than any blatant disregard for the instruction. However, the Enstrom pilot patently did not comply with his clearance, which was also the other part of the cause. Members concluded unanimously that this Airprox had resulted because following an incomplete readback that went unchallenged by AIR 09L ARR, the Enstrom pilot did not comply with his ATC clearance and crossed RW09R ahead of the departing A321. For his transit through the CTR the Enstrom pilot should have ensured that he was appropriately briefed but this was plainly inadequate. Nevertheless, it was explained to the Board that subsequent to this Airprox, the Enstrom pilot had arranged for further instruction with a qualified helicopter instructor that demonstrated a very positive approach and willingness to learn from this experience.

Turning to risk, whilst aware of the helicopter, it was not until they had commenced their take-off run that the A321 crew recognised that the Enstrom pilot was not proceeding as he had been expected to do. Highlighted by TCAS, the 1st Officer sighted the helicopter ahead some 400ft above them as it crossed the runway. CAT pilot Members were of the view that 'in extremis' the A321 crew could have rejected their take-off: that they did not do so and continued with their departure suggested to Members that as the helicopter had cleared the runway the A321 pilots were content with the separation. For his part the Enstrom pilot had seen the A321 at the RW09R threshold – wisely having checked the runway before crossing – but still not appreciating at the time that he had not been cleared so to do. By that stage it seemed that it was too late for the controllers to prevent the occurrence. However, the pilots of both ac were visual with one another's ac and the Enstrom was already clear to the N of the RW and some 300yd to port before the A321 lifted from the RW. This was sufficient to convince the Board that no actual risk of a collision had existed in the circumstances conscientiously reported here.

## AIRPROX REPORT No 016/08

### PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Following an incomplete readback that went unchallenged by AIR 09L ARR, the Enstrom pilot did not comply with his ATC clearance and crossed RW09R ahead of the departing A321.

Degree of Risk: C.

# AIRPROX REPORT NO 017/08

*Date/Time:* 11 Feb 1117

*Position:* 5024N 00357W (6·5nm ESE Plymouth - elev 476ft)

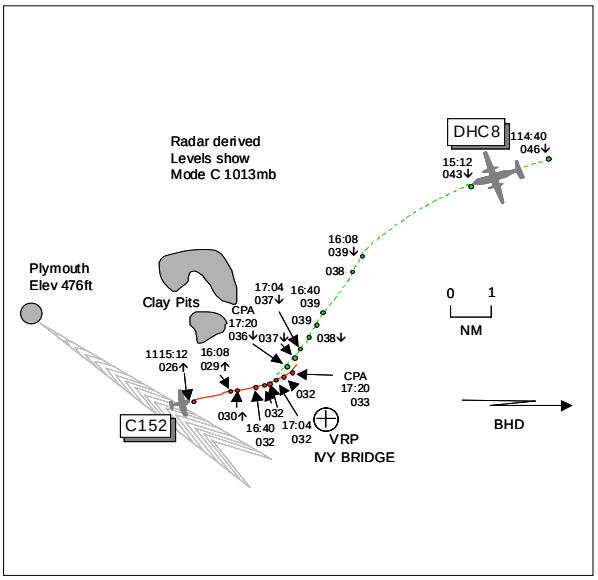
| | | |
|---|---|---|
| *Airspace:* | LFIR | (Class: G) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | DHC8 | C152 |
| *Operator:* | CAT | Civ Trg |
| *Alt/FL:* | 4300ft↓ | ↑5000ft |
| | (QNH 1030mb) | (NR) |
| *Weather* | VMC CLOC | VMC NR |
| *Visibility:* | 10km | NR |

*Reported Separation:*

500ftV/2-300ft H>1000ftV/>0·5nm H

*Recorded Separation:*

300ft V/0·2nm H




## PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

**THE DHC8 PILOT** reports inbound to Plymouth IFR and in receipt of an ATS from Plymouth on 133·55MHz squawking with Mode C. Whilst in VMC they elected to make a visual approach onto R base for RW31. Heading 200° at 200kt in the descent passing 4300ft QNH1030mb, they noticed a TCAS contact and the other ac's pilot indicated on the RT that he would stop his climb at 3000ft, he thought. However, the other ac appeared to continue climbing, resulting in a TCAS RA 'climb'. The Captain, the PF, became visual with the traffic, a C152, and coordinated visually against it (not following the RA climb), the C152 passing 500ft vertically below and 200-300ft clear on their LHS. He assessed the risk as high.

**THE C152 PILOT** reports flying a dual training sortie VFR from Plymouth and in receipt of a FIS from Plymouth on 133·55MHz squawking with Mode C. He had booked out 'to the north, various heights', believing he had indicated his intention to carry out general handling up to 5000ft. He received take-off clearance from RW13 with a LH turn out and, in accordance with normal practice, he climbed towards the area known as the 'clay pits'. He was aware of a DHC8 flight inbound but initially assumed it would be on the published approach of which he was well clear. The pilot of the DHC8 asked for his position which he gave to ATC stating that he would level-off at 3500ft, he thought, as he had heard the DHC8 crew were descending to 4500ft, he thought. Heading 360°, he thought, at 70kt prior to levelling-off, both he and his student saw the DHC8 several miles away flying in the opposite direction and watched the ac pass 0·5nm to their L and >1000ft above, he thought. The ac appeared to waggle its wings as it approached to indicate that the crew had seen their ac. This DHC8 was inbound from the N and, although they were visual with it, they were surprised to see a passenger ac so far from the approach procedure. In perfect VMC conditions with the DHC8 in sight he believed there was no risk. They were not physically close therefore there was no need to take any avoiding action.

**THE PLYMOUTH APP/ADC** reports the DHC8 was inbound from Bristol and was allocated FL45 to ERMIN with Plymouth Mil. On the DHC8 flight's initial call, it was indicating 250°QDM and he passed TI on visual cct traffic for RW13LH. About 5min earlier the C152 had departed to the N VFR. The DHC8 crew reported a TCAS contact so he asked the C152 pilot to report his position. The C152 pilot reported at the 'clay pits', 4nm ENE Plymouth, and climbing through 2700ft. The DHC8 crew then reported that they were also over the 'clay pits' descending and were turning L to widen the visual R base approach to RW31. Later when the DHC8 was outbound to Jersey, the crew reported that they were filing a TCAS RA report, he thought, on the incident.

**ATSI** reports that at the time of the Airprox both the DHC8 and the C152 flights were in communication with the Plymouth ADC. The RW in use was RW13 (surface wind 100º at 12kt) but the preferred operation by the DHC8 company is to land on RW31 and depart from RW13, this making use of the runway slope (0.95%). There are no radar facilities at Plymouth.

## AIRPROX REPORT No 017/08

The C152 pilot had booked out for a local VFR flight to the N and had been cleared to the holding point for RW13. Having confirmed that the pilot could accept a departure from the intersection, the ADC cleared the C152 for take off at 1110:20. The ac was seen to get airborne and at 1112:50, the ADC advised the pilot of the Wessex RPS, 1026mb.

Shortly afterwards, at 1112:55, the pilot of the DHC8 called and reported descending to FL45 and fully visual. The ADC passed the surface wind and enquired whether the crew wished to use RW13 or 31 to which they replied that they would accept RW31. The ADC passed TI on a PA28 that was just airborne and operating in the LH cct for RW13 and then cleared the DHC8 crew to make a visual approach. At this time the DHC8 was 18nm ENE of the airport.

At 1114:40, the DHC8 crew asked whether there was just 1 ac in the cct. The ADC advised that another ac (the subject C152) had departed to the N, asking its pilot to report his position. The pilot responded by saying that he was just by the clay pits passing 2700ft and climbing. (*ATSI note: the clay pits cover an area of several square kilometres situated some 4nm to the E and NE of the airfield and comprise of china clay workings).* The ADC then advised the DHC8 crew of this and that the PA28 was just turning downwind in the cct. The DHC8 crew replied "*Okay, we're over the clay pits at four seven so we'll flatten it out*". Analysis of the Burrington radar shows that when the DHC8 crew made this transmission they were approximately 11nm to the ENE of the airport but the C152 was not yet in radar cover.

The C152 appears on radar at 1115:12, when it is 4·5nm ESE of the airport tracking 070° and in the 11 o'clock position of the DHC8, at a range of 8·7nm. At the time, the DHC8 was indicating FL43 and the C152 unverified FL26. The ADC passed further TI to the DHC8 crew on another light ac which had just departed RW13 and was making an early R turn to route to the SW. The DHC8 crew replied (1116:10) "*Traffic copied (DHC8 c/s) we're just widening out our base to avoid the clay pit traffic*". The C152 pilot advised that he was to the E of the clay pits at 3300ft climbing to which the DHC8 crew responded by saying they were to the E of the clay pits at 4200ft.

At 1116:40, the C152 pilot transmitted that he was levelling off at 3300ft on 1026mb. The radar shows the C152 indicating unverified FL32 [3600ft RPS 1026mb] and in the 1230 position of the DHC8, range 2·5nm with the DHC8 indicating FL39. The DHC8 crew replied with "*(C152 c/s) you're six hundred feet below us and climbing, according to our instrument*". The ADC asked the C152 pilot to confirm his altitude to which he stated that he was 3300ft, visual with the DHC8 and it was '*not a problem*'. The two ac continued to converge and the DHC8 descended to FL37 whilst the height readout of the C152 remained constant at FL32 until the two ac passed each other at 1117:20 port-to-port at a range of 0·2nm, the DHC8 now descending through FL36 and the C152 indicating FL33. The DHC8 crew made no further comment but as they departed for their next sector they advised that they would be filing an Airprox.

The ADC reported that when the DHC8 called, approaching from the ENE, he assessed that there was no confliction between it and the C152 which was, supposedly, departing to the N. His main area of concern was the potential confliction between the DHC8 approaching RW31 and the PA28 carrying out visual LH ccts to RW13. The radar recording shows that the subject C152 did not depart to the N but initially routed to the SE and E. When TI was passed to the DHC8 about the C152, the DHC8 was still some 13nm from the airfield and over moorland.

Subsequent to this Airprox, the SATCO has reminded the flying club of the need to provide accurate information about their intended routeing when they book out and also to inform ATC if this should change thus allowing accurate and pertinent TI to be passed by ATC. Furthermore, controllers have been reminded of the need to visually check that departing light ac are operating in accordance with their booking-out details and to query any apparent discrepancies.

### PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

This incident occurred in Class G airspace where 'see and avoid' prevails and pilots are responsible for maintaining their own separation from other traffic. Members noted that many misconceptions/assumptions were made during this Airprox which permeate throughout this report. Firstly, Members expressed concern over the use of the 'clay pits' as a reference point, with both crews interpreting their positions against a geographical feature

that was widely spread over several square kilometres. When ATC asked the C152 pilot for his position, he had reported 'by the clay pits' when the recorded radar data shows the ac was apparently well to the SW of this broad location. Whereas the DHC8 crew were 11nm ENE of Plymouth when they reported 'over' them. A better option is to use a pinpoint feature (or VRP) which is clearly marked on topographical charts. Secondly, the C152 pilot had booked out and had subsequently been cleared to depart to the N when clearly the pilot routed SE and then E. It was understandable why ATC thought from this exchange of information that the C152 was well clear of the DHC8 as it approached from the ENE, as the controller had previously not noticed the C152's departure track once airborne nor did the pilot inform him of his SE'ly route. Thirdly, the C152 pilot had thought the DHC8 was descending to 4500ft whereas the crew had initially called descending to FL45 before continuing their descent for a visual approach. Also the DHC8 crew believed that the C152 pilot had stopped his climb at 3000ft whereas he reported at 3300ft RPS. One Military ATCO Member familiar with Plymouth operations explained that ERMIN is a reporting point 8nm on final approach to RW31; inbound IFR flights ac are normally released to Plymouth APP by Plymouth Military after receiving a radar service routeing from BHD to ERMIN to then establish onto the ILS. When following this route, ac fly much further away from the area of the 'clay pits' which is probably why the C152 pilot was surprised to see the DHC8 transiting through this vicinity. However, even allowing for these misconceptions, the DHC8 crew elected to join from the ENE for a visual R base onto RW31, had elicited the C152's presence from the RT exchanges and their TCAS equipment but erroneously believed the C152 continued climbing towards them when the recorded radar shows the C152 had levelled-off when its pilot reported doing so. The DHC8 crew had then descended into conflict with the C152, whilst disregarding the enunciated TCAS 'climb' RA, which Members agreed had caused this Airprox.

Turning to risk, the C152 pilot had assimilated that the DHC8 flight was inbound and stopped his climb after exchanging level information with the DHC8 crew who were widening their track to 'avoid the clay pit traffic' – or so they thought. He saw the approaching DHC8 and watched it pass clear to his L and 1000ft above, he thought, without the need to take any avoiding action. The DHC8 crew had seen the C152 ahead on TCAS and perceived the C152 continued climbing, generating a CLIMB RA. The recorded radar shows the C152 levelling-off as the DHC8 crew also momentarily arrest their descent before re-commencing it as the subject ac approach the CPA. The DHC8 crew saw the C152 visually and manoeuvred their ac visually to avoid it, watching it pass clear to their L and 500ft below. These visual sightings and actions taken by both crews allowed the Board to conclude that any risk of collision had been effectively removed.

## PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The DHC8 crew descended into conflict with the C152 whilst disregarding the TCAS climb RA.

Degree of Risk: C.

## AIRPROX REPORT NO 018/08

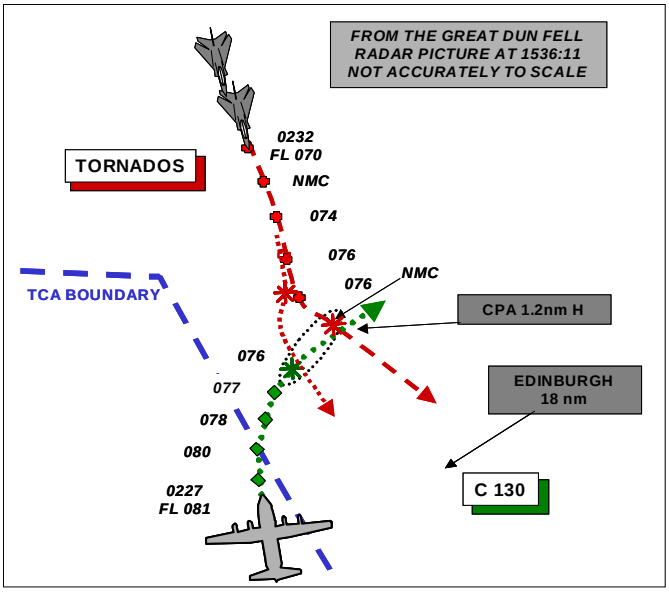
*Date/Time:* 13 Feb 1536

*Position:* 5605N 00251W (18nm ENE EDN)

*Airspace:* Scottish FIR (Class: G)

*Reporter:* ScACC (Talla) Controller

| | *1st Ac* | *2nd Ac* |
|---|---|---|
| *Type:* | KC-130 | Tornado F3 |
| *Operator:* | Foreign Mil | HQ AIR (Ops) |
| *Alt/FL:* | ↓FL70 | ↑FL100 |
| *Weather* | VMC NR | VMC CAVOK |
| *Visibility:* | NR | 30nm |
| *Reported Separation:* | | |
| | NR | 300ft V/1000m H (No2) |




*Recorded Separation:*

Estimated 500ft V/1.2nm H (as No2 crossed the C130's nose)

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

**The ScACC CONTROLLER** reports that he was on duty as Talla Controller operating as an OJTI with a trainee. They had a C130 inbound to Leuchars, in the descent to FL70, which had been co-ordinated with APP via the Tay Sector. His trainee had handled the flight correctly and in accordance with the latest procedures, descending it to FL70 and routeing it 'own navigation direct to Leuchars'.

The crew was passed the Leuchars squawk and he was about to pass the new frequency when he noted two ac, squawking 0231 and 0232 [2 x Tornado F3s] which he recognised as Leuchars squawks, just outside the TMA, heading S but on a direct track towards their ac which was approaching the boundary of CAS. At the time it looked as though the other ac were climbing to levels below that of the C130.

As the Leuchars ac closed on the C130 the STCA flashed and this caused him to be concerned about the intentions of the two southbound ac. As they discussed the ac, Tay rang to give them a frequency change for the C130, which had been passed by Leuchars, and they queried as to whether Leuchars had requested a heading on the C130 to separate it from the F3s, but they had not.

Just as the C130 crossed the TMA boundary, the conflicting ac were head on to it at about 3nm and he noted that they had climbed through the level to which the C130 was descending. He immediately gave it avoiding action in the form of a right turn onto 090° and passed TI with their observed level. The C130 pilot acknowledged the avoiding action, said that he was visual with the traffic and that the other ac were manoeuvring. At that time he thought the separation was less than one mile and that all three ac were at the same level. Once clear of the conflicting traffic, the C130 went 'own navigation' to Leuchars and was transferred to APP.

**THE KC-130 PILOT** reports that they were flying a grey ac with HISLS switched on heading NNE'sterly at 250kts descending inbound Leuchars under the control of ScACC when they noted a contact on TCAS 4nm ahead. They received an RA that told them to avoid a conflict by adjusting their vertical speed and climbing. Just as they received the solution they picked up the ac visually and it appeared to be in a 'Split S' Manoeuvre to avoid them. It was only a second or two prior to this that they had a call from ATC to turn to the right to a heading of 090°. He thought that the Tornado crews might have found it difficult to see his ac due to the position of the Sun.

He was not based in Europe and was unaware that ScACC had filed an Airprox on the Tornado until he received the paperwork some time later.

He did not assess the risk as TCAS had functioned correctly and he reacted appropriately to the warning given.

**THE TORNADO F3 PILOT** reports leading a formation of two light grey ac with HISLS switched on, heading 160° at 350kt on initial climb out from RAF Leuchars passing FL100 for FL175 and in receipt of a RIS from them. They were in 2nm Battle Formation and had a radar contact around 10nm ahead in the position passed by Leuchars and became visual with a C130 at about 7nm shortly afterwards. Their track would have taken them in front of the C130 but at around 4nm the C130 broke right, taking him into confliction with them. Tornado 2 (on the right and closest to the C130 initially) decided to evade it by turning to the left and increasing his ROC, whilst he elected to break right and low. Both pilots remained visual with the C130 throughout and had ample time to avoid it when it turned towards them. There was no risk of collision from their perspective.

**ScACC** conducted a very comprehensive report that is summarised below.

At the time of the incident the Talla Sector Controller was a supervised trainee who was combining the Planning and Tactical functions and was providing a RCS to a C130 inbound to Leuchars. A handover level of FL70 for the C130 was agreed with Leuchars Radar when it left CAS to the E of Edinburgh. The C130 called Talla sector at 1510:20 level at FL180 and was given initial descent 12min later followed at 1525:00 by a further descent to FL90. At 1526:45 the Tay Controller (whose airspace Leuchars airfield is within (sic) and who is responsible for co-ordination with them) called Leuchars to pre-note the C130 and it was agreed that it would descend to FL70 and be transferred to Leuchars.

The end of the call was as follows:-

Tay to Leuchars – *"Our Min Stack is 70 so we can drop him to that and throw him to you after his release the TMA of you like"*

Leuchars to Tay – *"70 at the TMA yeah that's fine"*

Although not explicitly said, the implication and standard practice is to transfer Leuchars inbounds at the TMA boundary to Leuchars Radar if there is no other Tay traffic to affect. This can be done by the Talla sector. The call was continued relating to which frequency the C130 would be transferred to and it was agreed that he would be offered a choice of VHF or UHF. The Tay Controller almost immediately called the Talla sector to inform them of the Leuchars squawk, descent level and contact details. It was then agreed that Talla sector would transfer it direct to Leuchars Radar. At 1532:00 the C130 pilot was instructed to resume his own navigation to Leuchars following radar vectoring by the Talla Controller who also gave further descent to the transfer level of FL70 at 1533:30 and 1min later he was instructed to change squawk to a Leuchars code of 0227.

At 1535 Leuchars called Tay sector to advise them that the C130 was to have a change of frequency to UHF 389.525. This information was immediately relayed to the Talla Controller and 5sec later the trainee Talla Controller instructed the C130 pilot to call Leuchars, which he acknowledged. A few seconds later the Talla mentor Controller took over the RT to ask *"C130 C/S, Scottish, you still with us?"* which the pilot confirmed and, at 1535:35, the mentor issued the following avoiding action to the C130 pilot:

"C130 C/S - Avoiding Action. Turn right immediately heading 090 degrees. You've got traffic in your twelve o'clock; the range is 5 miles climbing through FL72, unverified traffic"

Immediately after the Avoiding Action the mentor passed more TI to the C130 pilot and asked *"….can you see the traffic? Are you making the turn?"* to which the pilot replied *"Have him in sight"* followed a few seconds later with *"And he's clear"*. This transmission was timed at 1536:05 and is the CPA. Five seconds later the pilot asks if he can go back on his own navigation to Leuchars, which the Mentor Controller agrees. Before the ac was transferred to the Leuchars frequency at 1557:00 the mentor controller advised the C130 pilot:

"Thanks. Just for your information we're probably gonna have to do paperwork on that. I believe the traffic is wearing a Leuchars squawk so they should have had information on the traffic and they know that you're coming"

and the pilot responded: *"They manoeuvred".*

A trainee as combined Planner and Tactical was operating tala sector. Both trainee and mentor agreed that traffic levels were comfortable/moderate and neither felt that there was a need for the sector to be double manned. The trainee was about half way through her training with about 200 hours on the sector, this sector being her first validation.

Their primary radar source was Lowther Hill Radar which was set up at a range of 55nm and the second radar tube was set up using Great Dun Fell (GDF) Radar, set to a wider range. As the C130 became closer to the TMA boundary the Lowther Hill picture was moved further N to observe Leuchars and both controllers were aware that there was aerial activity in the vicinity of Leuchars including the two ac that were eventually to come into conflict with the C130.

In the few minutes prior to the incident both controllers had been discussing the procedures for Leuchars inbounds and had been talking about the frequencies which were both (the first two initial ones) written down on a scratch pad. The procedures were new and neither controller had experienced them before so the discussion was extended to ensure the trainee fully understood. At this point the C130 was descending to FL90, which was when they both became aware of the Tornado squawks routing SE'sterly. The Tornado tracks were discussed between mentor and trainee and they thought that the ac were going to stop their climb at alt 6000ft that would have separated them from Min Stack Level of FL70.

While dealing with some other tasks Tay called again to give the change of frequency, which was written on the scratch pad. This third and late change of squawk reinforced in the Talla controllers' minds that Leuchars were able to see the C130 since they had been informed of the Scottish squawk when they had been initially pre-noted about the traffic and would therefore be aware that it would potentially be in conflict with their F3s.

The trainee then gave the change of squawk followed by the frequency that the C130 pilot was to call. It was at this point that the mentor observed the F3 tracks climbing through 6000ft and since his trainee had her head down looking at other strips he took over the RT and issued the Avoiding Action instructions.

Discussion then focussed on the mentor controller's decision to give the Avoiding Action turn to the right rather than to the left that may have kept the C130 in CAS. The mentor controller reported that he took this decision based on the following:

He had only moments to decide appropriate action:

Rules of the Air outside CAS;

The Lowther Hill radar has a six seconds update rate; and

His assessment that the 0231 squawk was turning towards the left hand side of the C130.

This last point can be seen by the trail dot history, which indicated that the 0231 squawk was in a right hand turn. However, the last two dots in the trail suggest that this right turn had finished and that the ac was now beginning a left turn to go back onto his original track.

[UKAB Note (1): At this time the ac were completing their respective weapon checks which require them to fly in trail on one another for a short time].

In the seconds that the controller had to assess this it would have been extremely difficult for him visually to acquire that information and hence he made the decision to give Avoiding Action to the right. His perception at the moment of giving the Avoiding Action was that there was more of a confliction if a turn to the left was given and that a turn to the right would be more effective. In light of the rapid manoeuvrability of the two Tornados this subsequently was not the case although the controller had no knowledge of this at the moment of decision.

A left turn at that moment would have kept the C130 in CAS although during the turn the C130 may have gone outside CAS for a few seconds.

Both the trainee and the mentor had been cognisant of the Tornado squawks prior to the incident when they had been low level and making high-energy manoeuvres [weapon checks] to the N of Edinburgh. As the tracks began to move in a SE'sterly direction the mentor prompted the trainee to take the C130 off the heading and direct own navigation to Leuchars in order to ensure that the ac would go behind the track of the formation.

Leuchars APP did not inform Scottish that there was a potential confliction to the C130 outside CAS. Although the F3s, who were under a RIS, were given traffic information on the C130 there was no apparent action to ensure that they did not come into conflict albeit when they would be outside CAS.

Although the projected crossing point of the C130 and F3s was outside of CAS in Class G airspace there was no built-in assurances to the Controller that the ac would not come into confliction. The Avoiding Action given by the Talla controller put the C130 in direct confliction with the Tornados: however the Controller did not have the benefit of hindsight and based his decision purely on the visual information available to him at that point in time which was that at least one of the two tracks would go to the W of the C130.

**ATSI** reports that they have little to add to the comprehensive ScACC report other than to clarify the procedures for traffic inbound to Leuchars. Previous to the 'new' procedures quoted in the report, the ScACC MATS Part 2 stated: "The Talla P controller is to release Leuchars/Dundee inbound traffic to Edinburgh APR, who will transfer the traffic to Leuchars once clear of controlled airspace". Currently 'FPS for Leuchars arrivals via Talla will be printed for Tay sector. Tay will pass an ETA for abeam EDN to Leuchars Radar, and will agree an arrival level, usually the Sc TMA Minimum Stack Level. Leuchars will issue a squawk. If Tay sector have no known conflicting traffic, the squawk and agreed level will be passed to Talla sector who will transfer the arrival directly to Leuchars Radar. If Tay sector do have known conflicting traffic, an acceptance level and routing shall be co-ordinated with Talla sector, who shall transfer the arrival to Tay no later than the controlled airspace (TMA) boundary. Any descent below Minimum Stack Level before the controlled airspace boundary must be co-ordinated with Edinburgh Radar'.

It is understood that the procedures were changed at the request of Edinburgh, to reduce their workload.

**MIL ACC** reports that the incident occurred during a busy period with a shortage of personnel. Leuchars APP was handling all Approach, Zone and Departures (DEPS) traffic as well as an ac operating on a discrete frequency to the E of Leuchars. Leuchars ATC had received a pre-note from ScACC TAY Sector on a C130, inbound to Leuchars and descending to FL70 routing through the Scottish TMA prior to being free called to Leuchars at the TMA boundary. In order to manage the APP Controller's workload, the Supervisor (SUP) took control of departing traffic using the APP's radar display.

A formation of 2 Tornado F3s, airborne from RAF Leuchars calling DEPS at 1533:02 on UHF, the Leader reporting that the formation was *'airborne, Radar Information Service, coming left er South, climbing FL150'*. The SUP acting as DEPS acknowledged the call, provided a RIS and cleared the formation to climb to FL150. At 1534:04 F3 Leader advised DEPS that the formation was altering course *'coming left 160'* which was acknowledged by the Controller. At 1534:57 DEPS advised the formation *"traffic, er 10 miles due south of you, northbound, its, er C130 passing 85 descending" [C-130 C/S].* Leader acknowledged the traffic by saying, *"C/S weapons contact*" at 1535:06. The formation was observed continuing towards the C130 that was seen to turn right suddenly onto a NE'sterly track. DEPS called the traffic again at 1535:59 *"C/S that C130 just coming up to the west of you by 1 mile passing FL75"*. At 1536:04 F3 Leader reported, *"C/S are visual"* which the controller acknowledged.

The F3 crews later reported that after the first TI call they were happy with their separation from the C130 but had been very surprised by its sudden turn to the right which necessitated them taking significant avoiding action when previously none had been required; one ac evaded 'left and up' while the other [leader] evaded 'right and low'.

The F3s were then passed a squawk for Scottish Military and transferred at 1538:13, while the C130 continued inbound to Leuchars without further incident.

It is considered that there were no Mil ATC causal or contributory factors in relation to this reported Airprox because the Leuchars Supervisor, acting as the Departures Controller, correctly applied a RIS iaw JSP552 235.115.1.

[UKAB Note (2): The minimum separation is not easy to determine from the radar recordings. However the following is clear (GDF-based but Lowther Hill is similar):

Initially the No 2 Tornado is ½nm in front of his leader, both are below the C130 but are climbing towards it. The No2 Tornado is the closest to the C130 which is in its 11 o'clock, above him and descending, but the projected tracks would have taken the C130 behind both Tornados. At 2nm the C130 turns right, towards the Tornados, at the same level and the No2 Tornado opens rapidly to the E to generate a lateral separation of over 1nm, passing through the C130's nose at 1.2nm climbing very quickly from FL71 on the sweep before the tracks cross. On the sweep before the tracks cross the C130 is at FL76 and in a TCAS climb. Although the Tornado's Mode C drops out during the rapid alt changes as the tracks cross it is fairly clear that it quickly climbs through the C130's level 1.2nm ahead and crossing at about 90° to its track. The leader turns hard right and descends to FL048 passing to the L of the C130 3000ft below it.]

**HQ AIR OPS** comments that it would appear that the ScACC Controller, having seen the conflicting F3s, made an incorrect assumption as to their intentions. His subsequent, late, avoiding action turned the KC130 into conflict with the F3s who visually avoided it.

**HQ 3 AF** had nothing further to add.

## PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

An experienced Controller Member observed that the Planner and Tactical functions had been combined and that a trainee, supervised by a mentor, was operating the sector. He noted that, although, possibly not a factor in this incident, bandboxing and mentoring have featured in several incidents considered by the Board recently, the latter perhaps because of the amount of training necessarily undertaken.

Members noted that there was a clear difference of perception of the agreement between Tay and Leuchars, the Talla Controller(s) seeing it as co-ordination and Leuchars as purely a prenote. The ATSI Advisor informed Members that it was reasonably clear from the telephone transcript that, although the call had been a prenote and there had been no co-ordination agreed between the Tay Controller and Leuchars, this had not been communicated clearly to the Talla Controller who thought that Leuchars were aware of the C130's intentions and would deconflict the F3s from it, despite that the former were (VFR) in Class G airspace.

Discussion then centred on the avoiding action given by the Talla Mentor controller. The Mentor had expected Leuchars to take action to deconflict the ac by altitude and was surprised to note that during (or possibly just after) the handover this was not the case as the F3s continued their climb. Members unanimously agreed, however, that if the controller had been concerned by the proximity of the ac after the C130 had left CAS, a turn (orbit) to the left would have been a better course of action and would have kept the C130 in the known environment of the CAS under his control. One Member suggested that although they were only about 2nm to the E of CAS, it was unlikely that the F3s would infringe that airspace given that Leuchars-based F3s frequently fly that route.

Although there was some discussion regarding the precise sequence of events from the C130 pilot's perspective, it was fairly clear that things developed quickly after, and possibly as a result of, the avoiding action turn to the right. After the turn had been instructed and partially completed, he saw the Tornados, received (during and probably as a result of the turn) a TCAS RA 'adjust vertical speed' almost immediately becoming to a 'climb' command and he reacted correctly to them. The radar data shows however, that this action had not had time to take effect before both F3 pilots took their own robust avoidance.

Nevertheless, despite that the Talla Controller's actions might have contributed to this incident, it took place in Class G airspace where 'see and avoid' pertains. In this case the pilots of all 3 ac saw the opposing ac in good time; the F3s took successful avoiding action as early as they could during the developing situation and the C130 pilot followed the TCAS RA, albeit in respect of rapidly manoeuvring targets, thus preventing any collision risk.

Members agreed, however, that the avoiding action to the right given by the Talla Mentor Controller had exacerbated the situation and contributed to this Airprox.

**PART C: ASSESSMENT OF CAUSE AND RISK**

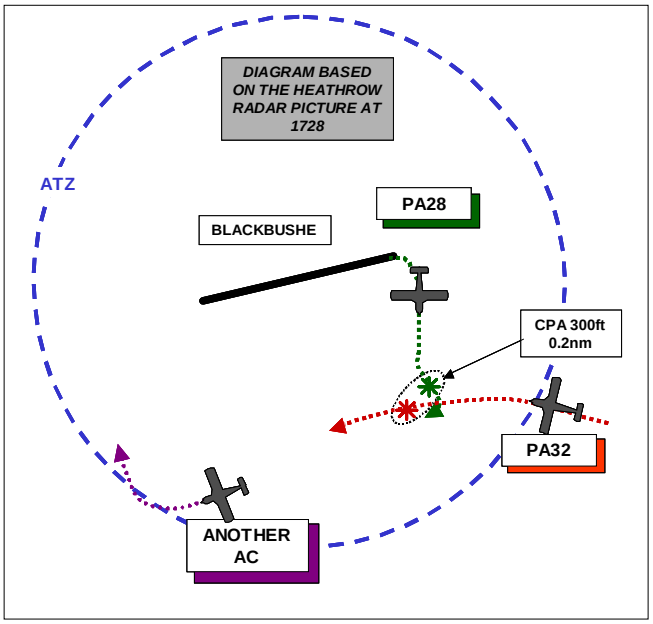
Cause: A conflict in Class G airspace resolved by the Tornado crews.

Degree of Risk: C.

Contributory Factor: The avoiding action chosen by the ScACC (Talla) mentor controller.

## AIRPROX REPORT NO 019/08

| | | |
|---|---|---|
| *Date/Time:* | 16 Feb 1729 (Saturday) | |
| *Position:* | 5118N 00048W (Blackbushe cct elev 325ft) | |
| *Airspace:* | ATZ | (Class: G) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | PA28 | PA32 |
| *Operator:* | Civ Trg | Civ Pte |
| *Alt/FL:* | 800ft (QFE 1028mb) | 800ft (QFE) |
| *Weather* | VMC CAVOK | VMC CAVOK |
| *Visibility:* | >10km | 10km |
| *Reported Separation:* | 0ft V/250m H | 0 ft V/200-300m H |
| *Recorded Separation:* | 300ft V/0.2nm (360m) H | |




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

**THE PA28-181 PILOT** reports flying a white and blue ac with strobes and nav lights switched on squawking 7000 with Mode C and he was PiC while undertaking a local cct training detail at Blackbushe with a PPL student. The RW was 07 with a right hand cct and after completing one of 3 ccts and while on the final approach he noted a call from a PA32 ac wishing to join downwind for RW07. The PA32 was advised of cct traffic and it was suggested that he should give way to the traffic.

UKAB note (1): At Blackbushe only the incoming transmissions are recorded so this cannot be verified. After the joining call however the PA32 pilot transmits *'wilco'* in response to an unrecorded transmission.

After touchdown for a touch and go, the student pilot applied full power and no further call was heard from the PA32 throughout the climb away. On crosswind heading 160° at 95kt the student completed the after takeoff checks turning off the landing light and selected cruise/cct pattern power. Just prior to turning downwind he became visual with the red, white and blue PA32 about 300M away, at a similar altitude in a fixed position on windscreen [to their left] at a perpendicular track converging with them. He took control from the student, applied full power and commenced a climbing turn to port. He then made an RT call "PA28 avoiding action". The PA32 then descended about 150ft retaining its constant bearing.

He reported the incident on the RT and assessed the risk as being Medium. Thereafter he continued the training session to try to relax the student after two more ccts the flight was terminated. He was unable to contact the PA32 pilot to discuss the incident on the ground.

**THE PA32 PIPER SARATOGA 11 TC PILOT** reports that he was flying a red white and blue ac on a flight from Le Touquet to Blackbushe with all lights switched on and was squawking 7000 with Mode S. He was joining the Blackbushe cct from the Farnborough overhead heading about 255° at 120kt in receipt of a FIS from Tower.

Normally, unless the cct is free, he flies a normal overhead join and descends on the dead side but on this occasion, since there were only two other ac reported in the cct and with good visibility, he positioned to join right-hand downwind. He believes one ac was already late downwind and he noticed the [reporting] PA28 on initial take-off and climb out from RW 07.

He estimated that he would be ahead of the PA28 well before it got to the downwind leg and diverted his attention to look for the other ac.

As he was becoming established in an early downwind position, he realised that the PA28 was now at cct height and was approaching the end of its crosswind leg and was potentially in conflict with himself. It had obviously climbed faster than he had anticipated probably because, unlike most of the other school planes it was an 180HP Archer and also due to the low temperature that day.

Almost immediately after he saw the PA28, its pilot who had obviously become aware of his presence, initiated a climbing turn to port. To further improve their separation he simultaneously responded by a descending turn to port. He then continued downwind, with the PA28 positioning downwind behind him.

He did not consider that the closest proximity was sufficient to file an Airprox assessing the risk as being very low, and it did not unnerve his passenger who was sitting in the RHS however, with hindsight he considers that it would have been better to have flown an overhead join.

UKAB Note (2): The recording of the Heathrow radar shows the incident clearly. The PA28 is seen shortly after its touch and go establishing on a crosswind track of about 170° and climbing to (1300ft amsl (1000ft agl). The PA 32 can also be seen descending initially to 1100ft amsl and turning left to join downwind about 2nm SE of the Airfield Datum. At 1727:55 the PA28 is at an alt of 1200ft in the PA32's 2 o'clock position at 0.5nm, the latter being at 1100ft. On the next sweep (4 sec later) the ac continued to close and, at 1728:02 the PA32, having descended to 1000ft, crossed in front of the PA28, which had climbed to 1300ft, at a distance of 0.2nm. Thereafter the PA32 continued its cct in front of the PA28 that had turned left slightly, apparently to avoid it.

UKAB Note (3): The UKAIP at AD 2-EGLK-1-4 2.22 Flight procedures states:

a. All circuits are to be flown south of the aerodrome.

Circuit heights: Light single engined ac – 800ft (AD QFE) etc.

UKAB Note (4): The Farnborough METARs for the period were:

1720Z 16/02/08 EGLF 161720Z 07007KT CAVOK 03/M03 Q1041
1750Z 16/02/08 EGLF 161750Z 07008KT CAVOK 03/M03 Q1041

**ATSI** noted that there were no ATC aspects to this incident.

## PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board was informed that Sunset on the day of this incident was 1717 which might have been a factor in that both ac had been flying in reduced light conditions and perhaps trying to land before the start of night flying (1747) or airfield closure (1800). Nevertheless an experienced GA pilot opined that despite there being only 'two in' it would have been better for the PA32 pilot, as he agreed with hindsight, to have flown a standard overhead join which would have facilitated correct integration into the circuit pattern. As it was, by a combination of joining downwind and other factors, the PA32 pilot joined the circuit too close and in front of the PA28 causing the latter's instructor to take control and initiate avoiding action. Members noted that the PA32 pilot thought that because of the increased power of the other ac (an Archer) and the low temperature (say 8 degrees C below the norm), the PA28 had climbed away more quickly than normal. Specialist Members however thought that this would not have been a significant factor and in any case the PA32 pilot should have positioned behind the PA28. Since both pilots saw the opposing ac and the PA28 pilot took timely and effective avoidance, the Board determined that there had been no risk of the ac colliding.

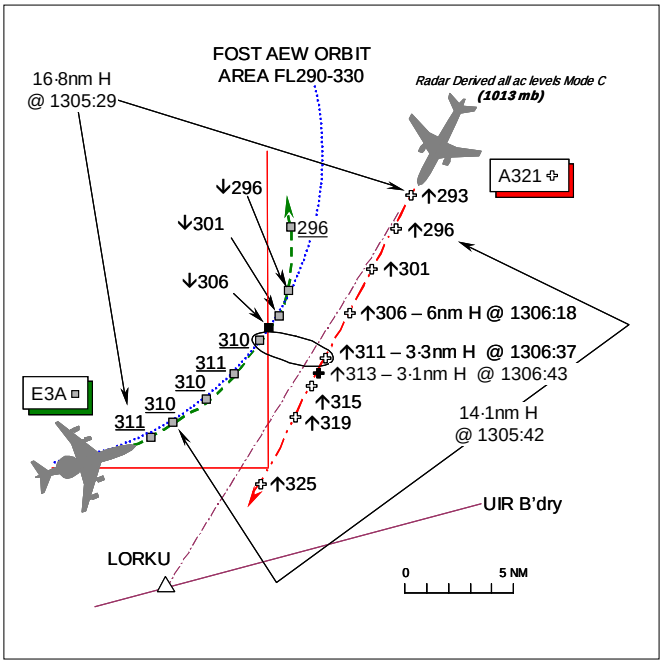
## PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The PA32 pilot did not integrate safely into the Blackbushe cct.

Degree of Risk: C.

## AIRPROX REPORT NO 020/08

| | | |
|---|---|---|
| *Date/Time:* | 14 Feb 1306 | |
| *Position:* | 5007N 00212W (25nm SSE of Portland Bill) | |
| *Airspace:* | AEW Orbit Area/UAR (Class: C) | |
| *Reporter:* | Plymouth (Mil) ATCRU | |
| | *1st Ac* | *2nd Ac* |
| *Type:* | E3A | A321 |
| *Operator:* | Foreign Mil | CAT |
| *Alt/FL:* | FL310 | ↑FL330 |
| *Weather* | VMC CLOC | VMC NR |
| *Visibility:* | Unlimited | NR |
| *Reported Separation:* | | |
| *PLY MIL:* | Nil V/3·3nm H | |
| | Nil V/4nm H | Nil V/4nm H |
| *Recorded Separation:* | | |
| | 100ft V @ 3·3nm H | |
| | 3·1nm Min H @ 700ft V | |




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

**THE PLYMOUTH MILITARY EAST CONTROLLER (PLY MIL)** reports that at about 1245 he received a pre-note from Swanwick (Mil) for an E3A which was booked into the FOST (Flag Officer Sea Training) E3 Orbit Area S of Portland Bill (PBL). He immediately telephoned the LAC Local Area Supervisor S (LAS-S) to inform them that the E3 area would shortly become active, as notified previously. Details of the E3A ac were passed and he requested a cleared flight path (CFP) at FL310 until 1400, which was approved. A moment later LAS-S called back to check on the RVSM status of the E3A which he checked with Swanwick (Mil). The E3A was RVSM-compliant and he phoned back LAS-S to confirm this.

The E3A was handed over to him S of R8 at about 1300 at FL300 tracking towards the orbit area under a RCS. He instructed the flight to climb to FL310 and cleared it into the orbit area. At 1306 the E3A was at the southern extremity of the Orbit Area, level at FL310, in an anti-clockwise orbit. He called traffic information to the E3A on a track observed 15nm NE, tracking SW, as "co-ordinated below". The ac was squawking A2246 and climbing through FL270 Mode C. With co-ordination in place for a CFP, he expected the other ac to level off below the E3A but he continued to monitor the track. As the conflicting ac got closer he noticed that it was continuing its climb and so he issued avoiding action, instructing the E3A pilot to turn L heading 350° as the previously called traffic had broken co-ordination and was passing FL308. The E3A pilot confirmed he was turning L, but he [PLY MIL] also noticed the E3A's Mode C indicated a descent and he was subsequently informed the E3A pilot had responded to a TCAS RA. Once the conflicting traffic was clear, he informed the E3A pilot and instructed him to climb back to FL310 and resume his orbit.

He immediately called LAS-S to find out why the conflicting ac had climbed through his co-ordinated CFP. The other ac was an A321 and he was informed that it had only just been handed over to BREST ACC who had been informed of the E3 Orbit Area and had stated that they would remain clear to the E.

Indications on the Plymouth Mil radar were that the CPA was 3·3nm at the same level.

**THE E3A PILOT** reports they were operating in VMC under IFR whilst established in the FOST orbit area at FL310 and in receipt of a RCS from PLY MIL on 124·15MHz.

Turning L through a heading of 040° at 360kt, PLY MIL called them to report co-ordinated traffic before the controller then directed them to turn onto a heading of 350° to avoid the other ac. They acknowledged the turn,

and had begun to bank when they received an ACAS-directed DESCEND RA. They descended approximately 1000ft in accordance with the RA [actually 1400ft] until the traffic was clear and their ACAS enunciated CLEAR OF CONFLICT whereupon they returned to their assigned level and continued in their orbit uneventfully.

They first noticed the traffic on their TVSI some 6nm distant, just as the controller was giving them their avoiding action turn instruction. It appeared to them that the closest distance between the two ac was about 4nm, at the same level, as they began their ACAS descent in compliance with the RA. They did not acquire the ac visually until after they had begun their descent.

Although they had not turned in time to avoid the ACAS RA, as the PLY MIL controller had seen the traffic and had given them an avoiding action vector they did not intend to file an Airprox and considered the risk *"low".* His ac has a white colour scheme with a gigantic black radome.

**THE A321 PILOT** reports they were outbound from London Heathrow for Madrid and had been cleared to climb to FL330 by BREST CONTROL. They saw on their navigation display traffic at 2 o'clock, at a higher level. Flying in VMC, visual contact was obtained at a range of 10nm with the traffic – a military AWACS type – which they kept in sight throughout. They continued as cleared, climbing to FL330 whereupon TCAS enunciated a TA. Climbing through the level of the other ac at about FL310, the AWACS ac passed 4nm to starboard on a reciprocal heading. No TCAS RA's were enunciated at any time and he assessed the risk as *"low"*.

**THE LAC S19-22 TACTICAL CONTROLLER (S20 TAC)** reports that he was operating with EGD036-040 active up to 37000ft alt and UK FOST E3 Orbit Area active at FL310. He was controlling the A321 which had departed from London Heathrow routeing S via KAPEX-MARUK-LELNA. Instructing the A321 crew to route direct to MARUK and climb to FL330, once it was established he instructed them to continue on their present heading and then transferred the flight to BREST CONTROL. Shortly after this, he realised that standard separation was not going to be achieved between the A321 and the orbiting E3A so he asked his S19-22 PLANNER to call BREST and ask them to stop the A321 at FL300. The PLANNER did this but reported that BREST advised that they "were happy for the aircraft to continue to FL330". The two ac passed each other by less than 5nm horizontal separation.

**THE LAC S19-22 PLANNER CONTROLLER (S20 PLANNER)** reports that having just taken over the position, he noticed that the A321 had been 'planned to BREST' at FL330 but there was a CFP flying in the E3 orbit area at FL310. After checking to see to what level S20 TAC was climbing the A321, he was surprised to see that it was climbing to FL330 but on a radar vector so he thought S20 TAC was vectoring the A321 away from the E3A orbiter. Shortly after observing this, S20 TAC transferred the A321 to BREST on its present heading. This heading was only just going to keep the A321 out of the area and as the orbiter was approaching towards it, he telephoned BREST VS Sector. 'Pointing out' the E3A orbiter to BREST, he asked them either to stop the A321 at FL300 or turn it L away from the E3A. BREST advised that they were happy with the heading the A321 was on but that would "pass it on to the next sector" whereupon STCA then activated.

**MIL ACC** reports that the E3A was participating in Flag Officer Sea Training's (FOST) weekly Thursday major exercise whilst operating in the published E3 orbit area over the Portland Danger Areas to the W of UN621. The orbit is a 15nm radius centred on 50° 16'N 002° 34'W, with activity published in the FOST Weekly Practise Programme (WPP) and distributed to all appropriate authorities a week in advance. Procedures are in place to amend or confirm the details of the planned activity the day before and on the morning of the activity between LAC and FOST. The details are confirmed again by the on-watch PLY MIL controller, along with the ac's details, immediately prior to commencement of the activity. All of these procedures were correctly carried out prior to the Airprox. When the E3A was prenoted to Plymouth Mil, the controller contacted LAS-S to pass the ac's details and obtained a CFP at FL310 - RVSM compliant. Shortly after the E3A's orbit commenced, the PLY MIL controller called traffic to the E3A's crew and reported it was co-ordinated below as per the CFP. However, whilst monitoring the Mode C of the A321, it became obvious to the controller that co-ordination was likely to be broken. Avoiding action was given; the E3 pilot complied and later reported that he had also complied with a TCAS RA descent.

Between 1248:47 and 1254:24, Plymouth Mil contacted LAC LAS-S to inform them that the E3 for the WPP activity was inbound for the orbit area at FL310 and a CFP at FL310 was negotiated. The ac details were passed, including current position, squawk and on-task squawk, RVSM status and expected time on task. The LAS-S called "contact" on the ac [in the vicinity of Brize Norton at the time] and approved the CFP at FL310. At 1256:24 PLY MIL were handed the E3A by Swanwick (Mil), 4nm E of BRIPO, heading 215° squawking A3351 at FL300. At 1258:54, the E3A crew checked in with PLY MIL on 124·15MHz, at FL300 *"approaching the FOST orbit"*,

whereupon the ac was identified and its pilot instructed to climb to FL310 under a RCS. The pilot requested to stay at FL300 but was instructed to climb to FL310 to assist with de-confliction with civil traffic. At 1305:31, PLY MIL reported to the E3A pilot *"..traffic 12 o'clock tracking SW co-ordinated below"* – the A321. The pilot acknowledged the call, stated *"searching"* and called *"visual"* at 1305:43. At 1306:18 Plymouth Mil transmitted *"E3 C/S avoiding action turn left heading 350° previously called traffic has broken co-ordination continuing climb currently passing FL308".* The pilot apparently took the turn (the transmission at 1306:27 was garbled but finished with "*left 350°")*. At 1306:37 Plymouth Mil reported to the *E3 pilot "..you are now clear of that coordinated traffic and..clear climb FL310".* The pilot reported in his statement that as he took the avoiding action turn issued by PLY MIL, he received a TCAS DESCEND RA with which he complied, descending about 1000ft. The radar replay shows the E3A taking the avoiding action turn. The descent from FL310 to FL300 is shown after the CPA, which was about 3·3nm at the same level. [UKAB Note: Minimum Horizontal separation was 3·1nm on the next sweep but the E3A had descended through FL306 at this point, in compliance with the reported DESCEND RA, and the A321 had climbed through FL313, thereby evincing 700ft of vertical separation at 1306:43.]

This Command considers that there were no Mil ATC causal or contributory factors to this Airprox. PLY MIL complied with all of the pre-requisite notification procedures and the controller obtained a CFP in good time, monitored potential conflicting traffic and issued avoiding action when it was evident that co-ordination was going to be broken.

**BREST ACC** reports, with a short RT and landline transcript, that they were not aware of the Airprox until they were contacted by the UKAB. "Portland Zones EGD013 & EGD017" were displayed on the radar screens but the Brest Sector V controllers knew nothing of the actual activity in this "Zone", and especially of the presence of an AWACS E3A in the vicinity.

The A321 crew first called the Brest V SC at 1305:37 passing FL295 in the climb for their assigned level of FL330 on a radar heading 208°. When the SC asked the crew to confirm their requested level, which was FL350, he instructed them to *"..continue radar heading and I call you back shortly for higher".* This occurred at 1306:28, when the A321 crew was cleared to FL350. At no time did the Brest controllers have any knowledge of any conflicting traffic: the A321 crew never reported any TCAS event.

The landline conversation between the LAC S20 PLANNER and the Brest PLANNER started at 1305:37 [at the same time that the A321 crew first called]. LAC S20 PLANNER asked the Brest PLANNER *"..[the A321 C/S] on heading is that a bit close to this military traffic did you either go left or stop him at 3 hundred until you're south of the 4-5-4-5 squawk".* The Brest PLANNER thought that the A321 was sent to Brest on a radar heading because of a military zone, but he actually did not catch the real meaning of the message as the A321 crew was routeing more or less to LORKU and the heading was considered as a good one by the controller.

From the Brest ACC perspective, there was no problem because the E3A military ac was not displayed on the controller's radar screen, which is normal practice within Brest ACC. If necessary, by pushing a button, BREST ACC controllers can display military traffic but on normal operations do not do so.

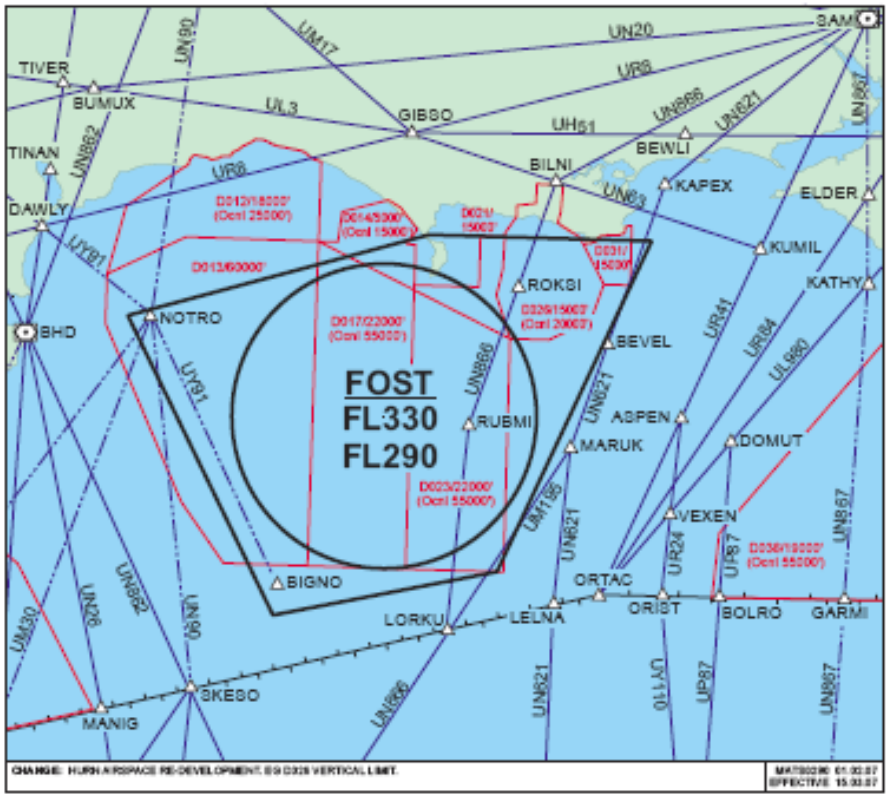
The records of the RTF and landline tapes show that both the A321 crew and the LAC S20 calls were made at the same time. While the radar controller was answering the pilot's call, the Brest PLANNER was talking to the LAC S20 PLANNER. Brest ACC controllers actually discovered the presence of the E3A flight later in the afternoon, being surprised at the unusually low level of southbound flights via LELNA/LORKU. Most of the flights were level-capped at FL270 or FL290. They were told by Swanwick controllers that traffic was not to be climbed until it had crossed the London/Brest UIR boundary.

Brest ACC had not been informed of the presence of the E3A AWACS flight and a report was filed by controllers to let the Brest ACC OPS Division know of this situation. LAC has been advised of this unusual situation and the potential risk of unknown military activity near the London/Brest boundary.

**ATSI** reports that at the time of the Airprox the A321 crew, who had previously been in communication with the LAC S20 TAC, was in contact with Brest CONTROL. S20 TAC described his workload as *"medium towards high"* whilst the traffic loading was *"low"*. The controller was operating Sectors 19-22 in a bandboxed configuration: sufficient staff were readily available to split the sectors if required.

Whilst the controller who was operating S20 is [normally] employed in a non-operational post, he does maintain currency on the sectors. The unit's investigation confirmed that he was complying with the unit's scheme for such controllers and worked 4 days each month in the Ops Room, 2 of which he tries to work in succession. This duty was his second consecutive morning shift.

The location of the FOST E3 orbit area is shown in the diagram below:




The A321 crew contacted S20 TAC at 1256:20, and reported heading 225º, climbing to FL150. Shortly afterwards at 1257:05, when the ac was about 8nm NE of Southampton, the controller instructed the crew to climb to FL190. Once the flight reached the western side of airway N866, the controller instructed the crew to climb to FL230 and turn L heading 205º. The A321 was now tracking along the edge of the airway and, at 1300:00, the crew was instructed to climb to FL330 and resume their own navigation for MARUK. At this time, the A321 crew was passing FL210 and the E3A was in its 2 o'clock at a range of 63nm passing FL300 in a L turn through S.

At 1303:25, the controller instructed the A321 crew to continue on their present heading. At this time the ac was just to the N of MARUK, passing FL263 for FL330. Meanwhile, the E3A was now at 2 o'clock at a range of 41nm, maintaining FL310, turning through SE in a gentle L turn. At 1304:55, the controller instructed the crew of the A321 to contact Brest CONTROL and report their heading, which was correctly acknowledged. At this time the A321 was passing FL283 and the E3 was in its 1 o'clock - 25nm and slowly turning L through E. The radar recording shows that the A321 continued on its heading and the E3A continued to turn L, eventually onto a northerly track. The two ac passed starboard-to-starboard at 1306:30, with a lateral separation of 3·9nm the A321 [still climbing] some 100ft below the level of the E3A.

The S20 TAC advised that he had started off his session, 40min previously, in the S19 – 22 PLANNER position. He was aware that the Portsmouth complex of dangers areas (EGD036 – 040) was active. Additionally, he knew that the FOST E3 orbit area, which is approximately coincident with the Portland Danger Area complex, would be active at some stage but no information on the specific time of activation was available to him. The effect of the Portsmouth Danger Areas being active was that inbound traffic would be positioned W of the standard route and so would fly over the Cherbourg Peninsula and towards ORIST and ORTAC.

At approximately 1250, the LAS arrived and advised that the FOST area would be active in 5min. The LAS pointed out the E3A which was just crossing airway UL9 in the vicinity of Lyneham at FL300. Accordingly the following recommendation is made:

"*The unit should review the procedure by which the LAG South Sector is advised of the imminent activation of the FOST orbit area. Consideration should be given to providing at least 15 minutes notice so that the relevant sectors can tactically position and/or coordinate traffic which is likely to be in the vicinity or the area when it is activated*".

The sector team then ensured that they were prepared for the arrival of the E3A and so the FOST area was displayed on both the TAC and PLANNER'S radar maps, an electronic strip was produced and placed in the PLANNER'S electronic strip bay and a paper fps was prepared for S20 TAC. Additionally, the electronic highlighter (the point-out facility) was used to make the track data block of the E3A more obvious. S20 TAC opined that, in his experience, it was rare to have both the Portsmouth and Portland areas active at the same time. He had worked before when the Portsmouth Danger Area complex was active but never when the FOST area was also active. The Unit investigation found that many of the controllers on the watch, not just those who maintain competence in addition to working in a non-operational post, had not experienced the FOST area being active previously. Accordingly, the following recommendation is made:

'*The unit should review its training in respect of operations when the FOST orbit area is active. Emphasis should be made of the track flown by the AWACS aircraft and the diameter of the orbit area*'.

As the in-situ TAC was due to be relieved shortly, he asked whether they could change positions and this was agreed. The subject controller then switched to become S20 TAC and accepted responsibility for the S19 – 22 Tactical position. After being in the Tactical position for just a few minutes, the A321 crew called on the frequency. The flight had already been coordinated out of the sector at FL330 [with Brest ACC], which had been done prior to the arrival of the E3A, and so S20 TAC decided that the best plan was to position it on the W side of the available airspace so that the pending inbound traffic could be routed on the eastern side. He planned to route the A321 along UN621 (SAM – KAPEX – BEVEL – MARUK – LELNA) as far as MARUK and then vector it to route between LORKU and LELNA. This, he determined, would keep it clear of the FOST Orbit Area and permit his plan to work.

At around this time a handover of the PLANNER position took place. The Tactical continued with his plan and could see that the next batch of inbound ac were about to call. He then did what he described as a 'clearing up exercise' in preparation for these ac calling. As part of this activity he instructed the crew of the A321 to contact Brest CONTROL just after 1304:50 and report the ac's assigned heading. He was content that this heading would keep the A321 clear of the FOST area and that separation would exist. Shortly after he transferred the A321, however, he saw that the E3A was now turning and heading towards the A321 and still only passing FL290. He spoke to the PLANNER and said words to the effect of; "*I don't like this, ring Brest and ask them to stop the* [A321 C/S] *at FL300*". (ATSI Note: this was the recollection of the controller later and, as it was not said on a recorded line, cannot be taken as verbatim). The PLANNER telephoned Brest, which coincided with the A321 crew reporting on their frequency at 1305:37. The PLANNER said "*Hello Brest we just* (unintelligible word) [A321 C/S] *on heading, is a bit close to this military traffic did you either go left or stop him at three hundred until you're south of the 4-5-4-5 squawk*". The Brest SC replied, "*Well I think on this heading it will be okay*". S20 PLANNER responded with "*Okay*" and the Brest controller replied, "*Yes, yes send him this heading*". Subsequent correspondence with Brest ACC revealed that the Brest SC thought the reason for the A321 crew being on a heading was due to a military 'zone' and so did not understand fully the meaning of the request. As far as the Brest SC was concerned the heading was good for LORKU and so he was happy to accept it. Brest controllers have non-relevant traffic, including military flights, filtered out from their display and so the squawk from the E3A was not visible on their radar. Furthermore, although they have the Portland Danger Area complex outlined on their radar they did not know what activity was taking place in the complex and knew nothing about the AWACS ac. It was later in the afternoon that they found traffic being capped at FL270 or FL290 and a restriction that such flights were not to be climbed until they had crossed the London/Brest UIR boundary. The fact that an AWACS aircraft was operating in the area was then passed on to them.

The S20 PLANNER informed his S20 TAC of the conversation and that Brest ACC was happy with the situation. As the ac had been transferred there was little more that TAC could do. It is probable that had the PLANNER instructed the Brest controller to stop the A321 at FL300 and not to climb further until the S of the UIR boundary, the incident would not have occurred. The Unit's MATS Part 2 requires that Brest ACC is informed whenever either

the Portland or Portsmouth Danger Area complex is active. However, there is no requirement to inform Brest if the FOST Orbit Area is active. Accordingly, the following recommendation is made:

'*The unit should consider informing Brest control whenever the FOST Orbit Area is scheduled to become active so that their controllers are aware of the effect it will have on traffic in the vicinity*'.

S20 TAC advised that, when he was in the PLANNER position previously, had he known that the FOST area was due to be activated in the near future he would have not planned the A321 out of the Sector at FL330, i.e. above the level of the AWACS aircraft. As the Sector had only 5min notice then the priority was to select the correct maps and produce the strips rather than start level capping ac which had already been coordinated.

In summary, S20 TAC climbed the A321 through the level of the E3A without ensuring adequate lateral separation. S20 TAC, in common with many of his colleagues, had not experienced the FOST Orbit Area being active before. However, when he saw the track of the E3A he did attempt to resolve the situation by asking S20 PLANNER to request that Brest instruct the A321 crew to stop their climb at FL300. This request was not made in an assertive manner and the Brest SC, being unaware of the presence of the E3A, could not see any problem. However, the PLANNER, being fully aware of the situation, should have instructed the Brest SC what to do and then explained the reasons for this 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 authorities.

The comprehensive reports provided by both Mil ACC and ATSI had laid bare the essential facts of this encounter over the English Channel between these two large ac. Moreover, the Board was briefed that the Unit had addressed all the points covered in the 3 recommendations made by ATSI in their comprehensive report. It was clear to the Members that Plymouth MILITARY had complied with the notification arrangements, agreed with LAC, to ensure that this activity could proceed under mutually agreed procedures. Here, the LAC S20 TAC controller involved had opined that it was rare to have both the Portsmouth and the Portland Exercise Areas active at the same time and he had never operated with both the Portsmouth Danger Area complex and the FOST Orbit Area active concurrently. The military area controller Member, with personal knowledge of the operation of the Airspace Management Cell (AMC), agreed that whilst the FOST E3 Orbit Area used by AWACS ac was not active that often it was, however, not an unusual occurrence. Nonetheless, the use of the Orbit Area had been promulgated to LAC the day before and the Watch Supervisor informed on the day of the activity. Members focused on the amount of warning that the S20 controllers had of the activation of the Orbit Area. It was clear that S20 was told by the LAS (S) at about 1250 - as soon as the latter had agreed the CFP - that the FOST area would be active in 5min, before the controller switched from the PLANNER to the TACTICAL position; this Airprox occurred about 16min after the controller had been informed. Whilst LAS (S) had correctly 'pointed out' the E3A before it reached the Orbit Area, just as it was crossing UL9 in the vicinity of Lyneham, the ATSI report had commented that this did not seem to be sufficient warning. They recommended that LAC should review the procedure under which the Sector is advised of the imminent activation of the FOST Orbit Area and that consideration given to providing at least 15min notice, thereby enabling the relevant sectors to position or coordinate tactically traffic likely to be in the vicinity when the Orbit Area becomes active with the E3. Whilst one controller Member was of the view that this all happened at short notice, the NATS Advisor commented that the unit was content with the notification arrangements and indeed the S20 TAC involved here was entirely cognisant of the presence of the E3A before and during the commencement of the Orbit. Even so, a civilian area controller Member opined, S20TAC had climbed the A321 to FL330, through the level of the agreed CFP and thus into potential conflict with the orbiting E3A at FL310. Although S20TAC had 'locked' the A321 onto a heading before switching the flight across to Brest ACC, a military controller Member opined that the projected track was always going to be about 3nm tangentially from the Orbit Area and therefore a potential conflict. But having elected to switch the flight across to Brest at that point there was now little that could be done by S20TAC directly even though the A321 was still in UK airspace. This early transfer of the A321 to Brest ACC prevented S20 from resolving the conflict directly when S20TAC realised the true situation and in the Board's view, this was a Contributory Factor within this Airprox. The NATS Advisor added that this scenario will be now be included in regular TRUCE (Training in UNusual Circumstances and Emergencies) continuation training.

Brest ACC reported that they were totally unaware of the presence of the E3A and had not received any prior notification or co-ordination from LAC. Members were also briefed that neither would a scan of their radar picture have immediately revealed the presence of the E3A, because the Brest ACC default SSR filter removes all military squawks from their radar displays. The latter point caused controller Members considerable angst. It seemed axiomatic that in order to provide the A321 crew with a radar service it was essential that the Brest controllers should be able to see other traffic on their radar display, which evidently they cannot because it is 'filtered' out. Moreover, the NATS Advisor confirmed that such traffic as is transferred before the UK airspace boundary - as the A321 here - is 'released on contact' and Brest Sector Controllers can turn or climb traffic as they deem necessary. Members were concerned with this state of affairs – switching traffic to the next en-route ACC early is acceptable provided it is clear of confliction, which here it was not. Furthermore, the Brest controllers were powerless to resolve any conflict if the situation deteriorated because the E3A was not displayed to them. Sensibly, the revisions to the LAC Supplementary Instruction relating to the FOST E3 Orbit Area – now contained in SI 065/08 LAC - had addressed this topic: the NATS Advisor explained further that the LAS (S) now also ensures that the Chef De Salle at Brest ACC is informed of the activity times, levels and the orbiter's SSR code. The S20 PLANNER then informs Brest that the activity has commenced and identifies the subject ac to the Brest Sector Controller including the ac's SSR code. The SI explains that this change will now ensure that Brest ACC are aware of the orbiting AWACs early enough to highlight such traffic to ensure that it is not filtered out. Members were reassured to learn of these improvements, which were specifically designed to reduce the potential for any recurrence of the event reported here. Additionally, the circumstances surrounding this Airprox are to be the included in further inter-unit discussions between the GM of Swanwick and Brest ACC very soon.

The SI had also reiterated S20TAC responsibilities: to ensure that before traffic is transferred to Brest ACC it is separated from the subject AWACS aircraft – by the stipulated minima - or that co-ordination is effected and it was readily apparent to the Members that this did not occur here. The ATSI report had revealed that S20 TAC was initially content that his chosen vector would keep the A321 clear of the FOST area and that separation would exist. Consequently as part of his "clearing up exercise" prior to another 'wave' of traffic, he instructed the crew of the A321 just after 1304:50, to contact Brest CONTROL. It was unfortunate that S20TAC had not realised earlier that standard separation might not be maintained, because it was not until shortly after he had transferred the A321 that he saw that the E3A was now turning L in the Orbit Area towards the A321, which was still only passing FL290 in the climb - some 2000ft below the agreed CFP level. One controller member wondered if there was a Human factors issue here and perhaps S20TAC was not entirely aware of the profile of the E3A before it became established in the notified Orbit Area, but the NATS advisor confirmed that the controller was aware of this flights intentions as notified to him by the LAS (S).

Although S20TAC was now powerless to intervene directly he did attempt to resolve the situation, by asking S20 PLANNER to contact Brest ACC and instruct the A321 crew to stop their climb at FL300. A controller Member pointed out that any action to try to forestall these events and prevent an erosion of standard separation clearly demanded urgency and had to be effected very quickly. Nevertheless, when the S20 PLANNER made contact with his French counterpart the ATSI report had shown that this request was not made in a positive manner and it was understandable that the Brest controller would be hesitant to take action when he was entirely unaware of the presence of the E3A and could not see it on his display. Some Members agreed that if the S20 PLANNER had acted more positively and persevered more forcefully he might have been able to recover the situation if he had proffered, and the Brest ACC controller had agreed to issue, an avoiding action instruction at the outset. But this would have demanded immediate action and as contact was made at about the time that the A321 was passing FL296– with only 400ft to go to FL300 – the prevailing view was that vertical separation would not have been preserved anyway. After a wide-ranging debate the Board concluded that this Airprox had resulted because S20 TAC did not ensure that separation would be maintained between the E3A and the A321.

In considering the inherent risk it was clear that the alert Plymouth Controller had acted promptly when he observed that the A321's Mode C indicated that the airliner was still climbing toward the E3A. Evidently the traffic information provided earlier had ensured that the E3A crew was aware of the presence of the climbing A321 and indeed the Mil ACC report had shown that the E3A pilot had reported visual contact on the airliner when the latter was about 14nm away. However, it was not until the A321 had exceeded FL300, the maximum level to which PLY MIL might reasonably have expected LAC to have climbed the A321 beneath the E3A, that it was clear to the PLY MIL controller that the established co-ordination agreement was about to be breached and avoiding action warranted. Whilst the avoiding action chosen was appropriate it was clear that PLY MIL had little chance of altering the situation dramatically in the very short space of time before the two ac passed each other. Therefore, it was not until the airliner was seen to be passing FL308 that the Plymouth Mil controller transmitted the avoiding action

left turn onto 350° at 1306:18 and explained why in the same transmission. This ensured that the E3A crew was immediately alerted to the situation, but it was clear from the Pease Pottage recorded radar data – a different radar source not available to the PLY MIL controller - that within two further sweeps of the radar the CPA of 3·1nm was reached. By that stage, however, the E3A crew was reacting to their enunciated TCAS DESCEND RA and were descending through FL306. Meanwhile the A321 – whose crew had spotted the E3A at a range of 10nm and had kept in sight throughout - was climbing through FL313, with 700ft of vertical separation evident at the closest point. Some members speculated why the A321 crew did not receive a TCAS RA. The consensus amongst the Board was that as the E3A was turning left, the point at which the trajectory of E3A would have penetrated the airliner's TCAS 'safety bubble' would have been very brief indeed. This, coupled with the horizontal separation and the rapidly changing geometry as the two ac passed on the beam, it seemed likely that given its climbing trajectory the A321's TCAS might have perceived that the integrity of its electronic safety barrier would not be breached – hence only a TA was enunciated with no need for an RA . Taking all these factors into account the Members agreed unanimously that no risk of a collision had existed in the circumstances conscientiously reported here.

Given the actions already taken at LAC, the Board was content that adequate measures had already been taken to address the concerns raised by ATSI in their report.

## PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The LAC S20 TAC did not ensure that separation would be maintained between the E3A and the A321.

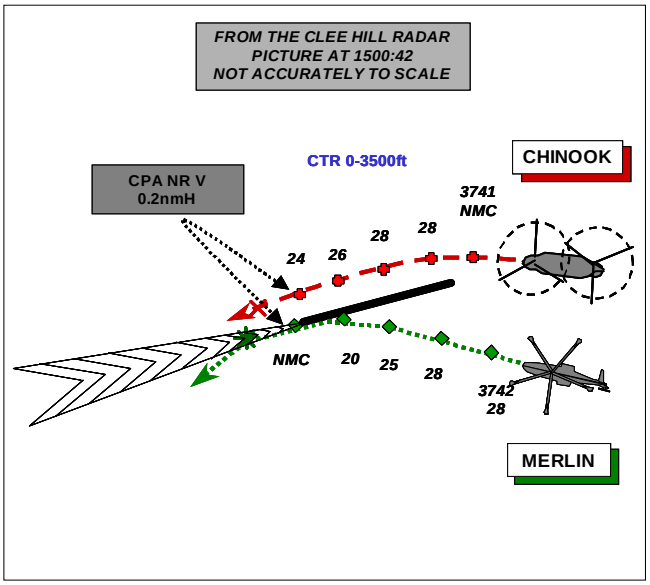
Degree of Risk: C.

Contributory Factor: The early transfer of the A321 to Brest ACC prevented S20 from resolving the conflict directly.

## AIRPROX REPORT No 021/08

## AIRPROX REPORT NO 021/08

| | | |
|---|---|---|
| *Date/Time:* | 15 Feb 1501 | |
| *Position:* | 5145N 00133W (Brize Norton - elev 287ft) | |
| *Airspace:* | CTZ | (Class: D) |
| | *Reporting Ac* | *Reporting Ac* |
| *Type:* | Chinook | Merlin Mk3 |
| *Operator:* | JHC | JHC |
| *Alt/FL:* | 2500ft (QFE 1027mb) | 2500ft (QFE 1027mb) |
| *Weather* | VMC Haze | VMC Haze |
| *Visibility:* | 7km | 5km |
| *Reported Separation:* | 500ft V/100m H | Nil V/400m H |
| *Recorded Separation:* | ~400ft V/0.2nm H | |




**BOTH PILOTS FILED**

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

**THE CHINOOK PILOT** reports that he was sitting in the centre seat, examining 2 pilots on their annual IRT. The pilots were in a high workload situation changing from one procedure to another but he considered it acceptable. After completing an approach to the in-use RW (08) at Brize Norton, the ac was climbed to continue training. They were in communication with Brize APP. In order to expedite and maximise the training, an ILS approach to RW26 was requested and approved by APP. The ILS to RW26 did not appear to be serviceable so an approach was not carried out and they maintained 2000ft and tracked back towards the BZN overhead. The non-handling pilot (NHP) requested a climb to 2500ft in order to carry out a TAC-to-ILS procedure to RW 08 as published. The crew were cleared for the procedure, climbed to 2500ft [QFE, in accordance with the procedure] at 120kt and reported overhead the BZN (TACAN). They were then cleared by BZN APP to *'climb at their own discretion'* so the NHP asked for confirmation as the ac was already at 2500ft. ATC replied that clearance had only been given to 2000ft. The NHP then informed ATC that they believed clearance had been given to 2500ft [QFE] but APP disagreed so the ac was descended to 2000ft and the procedure was carried out.

While the RT conversation was taking place, the crew were completely unaware there was a Merlin in the hold at 2500ft [QFE]. A Merlin was then seen 500ft below taking avoiding action, passing down their LHS about 500ft below. The ac was subsequently recovered uneventfully to Odiham.

He assessed the risk as being medium.

**THE MERLIN MK3 PILOT** reports flying an instrument training sortie from Benson with another pilot. They were leaving the BZN hold for a TAC-to-ILS for RW08 at 2500ft QFE on the published heading of 270° at 120kt and when they were at 1·5nm inbound to the TACAN he saw a Chinook 400m away and converging at the same height. They descended and turned left to avoid it while maintaining VMC, informing ATC of their course of action. He assessed the risk as being high.

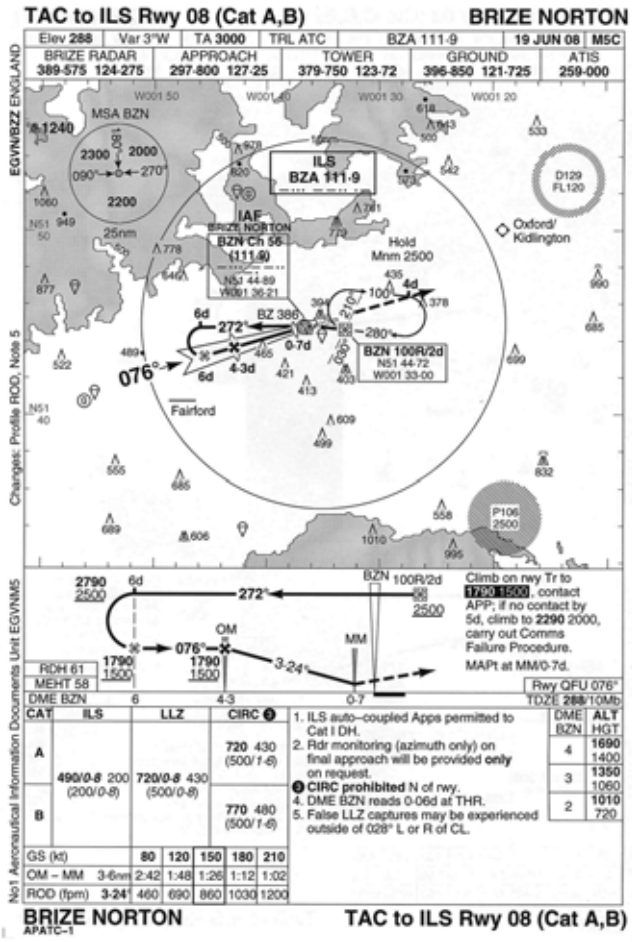
**THE BRIZE NORTON DIRECTOR** (DIR) reports that she had been in the position since about 1230 with only one short break and was working a medium to high level of director/approach traffic throughout the period with no assistance from the Supervisor. At the point of the incident she was working 2 ac with a medium to low intensity.

A Chinook requested an approach onto RW26 for an ILS while a Merlin was joining the hold at FL40 for RW08 [the duty RW] so, in the absence of the Supervisor, she agreed.

The Chinook made an approach to RW26 and informed her that he was unable to pick up the ILS. She then realised that she had forgotten to switch the ILS over to RW26. The Chinook pilot then requested a climb to 2000ft and to go beacon-outbound at 2000ft [she thought] for an ILS to RW08. During this time the Merlin in the hold [for 08] had descended to height 2500ft QFE for the procedure. She instructed the Chinook pilot to climb to 2000ft QFE at his discretion and then told him to report beacon-outbound at 2000ft QFE [see approach plate below]. She watched the ac climbing, looked away to tell the ZONE controller about the ILS when the Supervisor informed her that the Chinook was continuing to climb. She asked the Chinook pilot to confirm that they were level at 2000ft QFE but he said that they had climbed to 2500ft QFE. Once the confusion was resolved she instructed the Chinook pilot to descend to 2000ft QFE but at that point the Merlin pilot became visual with the Chinook and reported that he was taking his own avoiding action of a left turn and a descent. The Chinook then went beacon-outbound at 2000ft QFE whilst the Merlin rejoined the hold at 2500ft QFE.

**THE BRIZE NORTON SUPERVISOR** reports that on returning to the ACR after duties in the VCR, he observed the 2 ac in question manoeuvring within 5nm of the Brize overhead. It quickly became apparent that the Chinook had been unable to make an approach to RW 26 because the ILS was still switched to the RW in use – 08. The Merlin was on the inbound leg to the 08 TACAN hold and was just levelling at 2500ft QFE, having descended from FL40. Although the Chinook had apparently been cleared back to the TACAN at 2000ft QFE, he became concerned that the Mode C readouts of the 2 ac were showing less than 500ft vertical separation, reducing. He immediately questioned the APP Controller as to what the ac were doing at which point she interrogated the Chinook pilot regarding his height. With the ac now coming into dangerous proximity to one another, he issued another, sharper warning to APP that immediate action was required after which APP instructed the Chinook to descend: however, the Merlin pilot reported that they were visual with the Chinook and taking their own avoiding action.

UKAB Note (1): The Unit provided an in-depth report which detailed follow-up action. In particular the Unit had initiated new procedures when at minimum manning and new procedures in respect of approaches to the opposite RW.



## AIRPROX REPORT No 021/08

**MIL ACC** reports that Brize Norton was operating at reduced manning levels due to relatively poor weather and a short flying program. This decision was made by the morning Supervisor and continued by the afternoon Supervisor. However, although there were improvements in the weather, Practise Diversions (PDs) were still accepted throughout the day without the recall of any personnel.

During the time leading up to the incident, the APP Controller was band-boxing the DIR frequency and had been controlling a steady amount of traffic for 2½ hours with a 30 minute break before the incident; occasionally 3-4 ac were worked for a sustained period of time in the ACR. The Supervisor was in the VCR at the time and there were 2 ac on the DIR frequency, a Merlin and a Chinook.

The Merlin established contact with BZN DIR at 1447:51 and, at the same time, another ac was on the APP frequency being handed over to Benson ATC. Between 1450:38 and 1450:59 DIR ascertained the intentions of the Merlin. At 1451:56, the Chinook called DIR *"on overshoot"*. DIR replied with an instruction for the pilot to *"report ready for turns"* which the pilot acknowledged and DIR then continued with the Benson handover. At 1452:52, the Chinook pilot requested "*…just to speed things up are you happy for us to go outbound for the TAC to ILS 26 just to help us along?*", DIR responded that such an approach would give a tail wind of 14kt to which the pilot said, "*…I'm happy".* At 1453:05 DIR said *"Roger own navigation report beacon outbound RW26"* and the pilot acknowledged the instruction. At 1453:38 DIR told the Chinook pilot *"…you're cleared the full procedure and request intentions off this approach two zero zero feet".* The Chinook pilot stated *"…now levelling 2500ft and we are beacon outbound from the, er, BZN this time with a left hand turn back in for the, er, ILS26, 150 and then I'll overshoot to depart for Odiham"*. DIR acknowledged and after ascertaining what type of departure was required and passed departure instructions. At 1454:14 the Chinook pilot read back the departure details but requested that the Brize Zone frequency be repeated. DIR appeared not to have heard the request and told the Chinook pilot to report established inbound RW26. The pilot did not repeat the request but confirmed, *" will report inbound".*

At 1456:00 the Merlin pilot reported *"…taking the hold and is flight level FL40"* and DIR instructed the pilot to "*…report final turn inbound*". DIR then established the type of departure required and passed departure instructions. At 1457:49 the Merlin pilot asked the *DIR "…are you happy for us to descend now to 2500ft on 1027?"*. DIR replied *"Affirm, set the, er, Brize QFE 1027 descend report level 2500ft"* and the pilot read back the QFE and descent instruction. DIR then notified the TWR of the Merlin's intentions although the full conversation was not transcribed due to the Chinook calling on the frequency at 1458:16 *"Brize Norton Chinook C/S"*. At 1458:20 DIR replied to the Chinook pilot *"…approaching 3½ nm continue with Brize Tower 12372" but* at 1458:24 the pilot replied *" …I'm afraid the ILS doesn't seem to be working on, er, either our kit or yourself"…"er, if possible we'd like to track inbound to the beacon and then, er, actually go outbound for the, er, TAC to ILS for 08 we'll maintain alti, er, height 2000ft 1027"*. At 1458:39 the DIR replied *" Roger maintain 2000ft and, er, climb at your discretion".* The Supervisor reported that at this point, upon his return to the ACR from the VCR, the [Approach] controller appeared to be flustered. At 1458:43 the Chinook pilot stated *"Roger for the procedure we'd like to climb to 2500ft 1027".* At 1458:47 a [possibly] clipped transmission of *"ger"* was heard. At 1458:52 DIR told the ADC *"OK The Chinook going for RW 08 now"* to which the ADC replied *"The Chinook for 08. OK is he going to circle that in then?"* At 1459:19 DIR instructed the Chinook pilot *"…cleared the procedure report beacon outbound 2000ft on RW 08"* and the pilot replied *" Cleared the procedure and, er, report outbound on, er, for runway, er, 08 and we're from two thousand five hundred feet for the full procedure if you're happy?"* . At this point another voice was heard in the background but no detail then DIR continued *" OK going beacon outbound. Yeah he's only on 2000ft, I'll maintain outbound radial on the other one. The other one's in the hold at two and a ha"* at which point the Supervisor was heard saying *" they're the same level*" to which the DIR said *"yeak OK*".

The Supervisor reported that he became concerned that the Mode C readouts of the 2 ac were showing less than 500ft vertical separation and reducing which was when he questioned the DIR as to what the ac were doing. At 1459:49 DIR questioned the Chinook *pilot "…confirm you're level 2000ft?"* to which the pilot replied *"Negative, Chinook C/S carrying out the full procedure from 2500ft for the TAC to ILS 08 if you're happy?".* DIR continued *" Affirm. I, er, told you to climb 2000ft Sir*" and the pilot replied, *"Er, after that you told us to climb at our discretion".* At 1500:06 the DIR continued *"Roger climb at your discretion 'cos you were below my radar vector chart Sir".* The Supervisor is then heard reiterating, *"they're both at the same level".* The Supervisor reported that the ac were coming into dangerous proximity to each other when he issued another, sharper warning to the DIR that immediate action was required. At 1500:12 DIR instructed the Chinook *"…descend report level 2000ft"* and the pilot replied *"apologies, descending now reporting 2000ft 1027"*. At 1500:22 the Merlin pilot *reported "er,…taking avoiding action. Er, visual with the, er, Chinook we're coming left"* and DIR acknowledged "roger".

It is considered that a lack of situational awareness by DIR combined with a lack of timely, positive control led to the ac flying within 0.5nm of each other at the same height. In addition, the decision to approve the Chinook's approach to RW26 was made independently of the Supervisor which was in contravention of Brize Norton normal practice. Local orders have been amended to reflect best practise. Further, when DIR approved the approach to RW26, she did not reselect the ILS to that RW. Although both pilots were on the same frequency (for some of the time of the evolution) and should have been aware of each other's presence, DIR did not give either crew TI regarding the other ac [UKAB Note: The types of service that the 2 ac were placed on or were expecting was not clear. However, in Class D airspace they should have been separated and under Radar (or procedural) Control]. Finally, the use of non-standard phraseology and procedures by DIR led to the Chinook pilots being confused regarding the height to which they were cleared for the procedure to RW 08.

**HQ JHC** did not comment.

## PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board considered the parts played by each participant in turn.

Members considered that the Merlin crew had acted correctly throughout; indeed, one Helicopter Member commended them for their good lookout in poor visibility and subsequent avoiding action.

All three Chinook pilots appeared to be at best confused, more likely mistaken, as to their height clearance and indeed the type of ATC service that they were under. It was also unclear to Members whether they were operating VFR or IFR but, since they were in (rejoining) the published instrument pattern in fairly poor weather, it was assumed that they were under IFR. Further, JSP552 235A.100.2 states *"…Controllers are to ascertain the Flight Rules under which an aircraft is flying before the ac enters Class D airspace".* On the transcripts provided, there was no record of this being done in respect of either ac which, controller Members pointed out, is most important as it determines the type of service and separation requirements to be provided to participating ac. If respective ac were operating IFR in Class D airspace, they should have been under an Air Traffic Control Service, separated (by ATC) from other IFR traffic and if in proximity, TI passed to both pilots.

Some Members considered that the Chinook Instructor had contributed to the confusion by asking for an approach to RW26, which was not the duty RW, at the same time as the Merlin was in the hold for RW08 (the duty RW) just prior to commencing a let down and approach. Members were unable to determine positively why none of the Chinook pilots (from their report) were aware of the Merlin which for at least some of the time was operating and transmitting on the same frequency (from transcript of DIR frequency at 1457:58). The transmission made by DIR to the Chinook *"Roger maintain two thousand feet and er climb at your discretion"* was made at 1458:39 while the Chinook was at 2000ft (from the radar recording) and the response to his request to climb *("Roger for the procedure we'd like to climb to two thousand five hundred feet one zero two seven")* of *"ger",* although unclear and confusing was not proper clearance to climb as required in Class D airspace: nonetheless the Chinook crew took it as such and commenced a climb to 2500ft. Although one very experienced ex-military pilot instructor Member stated that he thought the cause of the incident had been a height bust by the Chinook crew who had not been given a correct clearance to 2500ft by DIR and which they in turn had not read back in the correct manner, this was not supported by the majority who considered that the controller's actions had been the major factor. One helicopter Member opined the Chinook crew, led by the instructor, had pursued a very complex and therefore high workload scenario for both aircrew and ATC. This high workload had possibly translated into a lack of awareness of 'the big picture', a lack of awareness of the presence of the Merlin (on its approach to the duty RW) and had increased to the point of overload (not reselecting the ILS) the pressure on the Controller. Although not a major factor, it was also observed that the Minimum Safe Altitude in the sector the Chinook was about to enter is 2300ft (2013ft QFE 1027).

Turning to the performance of the DIR, Members agreed that there had been significant lapses and omissions throughout the evolution that took place largely in a period of low to minimal traffic intensity. It seems that she was not fully aware of the procedures (military) for Class D airspace nor best practise at Brize Norton. Members concluded that her performance was unprofessional to the extent that both the Supervisor and the Merlin pilot had to intervene to prevent the possibility of a collision.

Members tried to determine why the controller had lost her SA when controlling only 2 ac, albeit in an unusual sequence of events. The Mil ACC Advisor stated that in her opinion fatigue had not been a factor since the controller had had a ½ hour break shortly before the event. Although Brize Norton had revised their reduced manning procedures, specialist opinion was that, due to the low traffic density, this had not been a factor either. Although the Supervisor had been in the VCR, this too was unlikely to have been a factor as he was readily available for consultation or could have been called to the ACR in a matter of seconds. As evidenced by the transcripts of TWR and APP, DIR did not request any help or advice. Despite considerable discussion and human factors analysis, the Board did not reach a definite conclusion on this issue.

When analysing all the factors, the majority of Members agreed that the controller should have ensured that the 2 ac were separated, in this case vertically, and that, although she believed that she had done so, poor RT discipline and a lack of timely and positive control led to the Chinook handling pilot climbing to the level she knew to be occupied by the Merlin. Further, when the Supervisor initially pointed this out, DIR did not take any immediate action to resolve the situation. Standard RT phraseology, techniques and readback procedures have evolved over the years for good reason. Although sometimes cumbersome, when degraded in any way there is frequently a risk, as witnessed in this incident, that safety standards will be eroded.

When analysing the degree of risk Members noted that the Merlin pilots, by exercising diligent lookout, had seen and avoided the Chinook thereby removing any risk of an actual collision. Members were however unanimous in their opinion that the normally high safety standards had been significantly reduced when the Chinook crew, apparently believing that they were cleared to do so, commenced a climb to the Merlin's height.

The Board noted the timely follow up action taken by Brize Norton ATC.

## PART C: ASSESSMENT OF CAUSE AND RISK

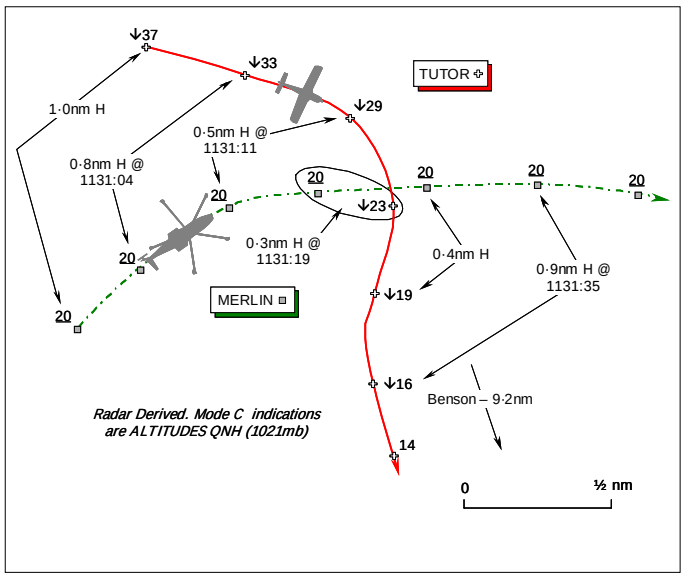
Cause: Brize Norton DIR did not ensure separation between the Chinook and the Merlin.

Degree of Risk: C

Contributory Factors: Confusing RT phraseology between Brize Norton DIR and the Chinook pilots.

# AIRPROX REPORT NO 022/08

| | | |
|---|---|---|
| *Date/Time:* | 21 Feb 1131 | |
| *Position:* | 5145N 00110W (9nm NNW of Benson - elev 203ft) | |
| *Airspace:* | Oxford AIAA | (Class: G) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | Merlin HC3 | Grob Tutor |
| *Operator:* | HQ JHC | HQ AIR TRG |
| *Alt/FL:* | 1800ft | 1800ft↓ |
| | QFE (1014mb) | QFE (1014mb) |
| *Weather* | IMC IICL | VMC CLOC |
| *Visibility:* | 1000m | 10km |
| *Reported Separation:* | | |
| | 100ft V/100m H | 200ft V/6-800m H |
| *Recorded Separation:* | | |
| | 300ft V @ 0·3nm H | |




## PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

**THE WESTLAND MERLIN HC3 PILOT** reports that he was completing an airtest and under a RIS from Benson DIRECTOR (DIR) on 356·125MHz whilst being positioned via radar vectors for a PAR to RW19 at Benson. Flight conditions were intermittent IMC and they were operating under IFR. At the point of the Airprox he was flying level at 1800ft QFE (1014mb) some 50ft below and 200m clear of cloud with an in-flight visibility of 1000m.

Whilst on BASE-LEG for the PAR, heading 100° at 120kt, a Tutor ac was spotted in his 1 o'clock - about 100m away he judged - as it crossed ahead of his helicopter from left to right (north to south) in a steep descent. He assessed the risk to be "high" and believed the Grob Tutor had descended through a hole in the cloud.

His helicopter has a dark green camouflage scheme but the white HISLs and landing lights were all on. A squawk of A3610 was selected with Mode C 'on'; the ac has no Mode S capability and neither TCAS nor any other form of CWS is fitted.

**THE GROB TUTOR 115E PILOT,** a QFI, reports he had just finished carrying out aerobatics with a competent and experienced student and had elected to descend prior to returning to base at Benson. Operating under a FIS from Benson APPROACH (APP) he was flying under VFR in VMC some 2km clear of cloud horizontally with a flight visibility of 10km.

At a position about 1½nm NE of Cowley with the car factory and the S of the City of Oxford clearly in view, having identified and assessed a gap in the cloud as clear and large enough for a safe descent, he directed his student to descend through the gap in a direction away from the Benson MATZ to the E. They descended through the gap, keeping clear of cloud and they both diligently searched for conflicting traffic: none was seen. Heading 220° at 140kt as they descended rapidly through about 2000ft QFE (1014mb), they both observed a Merlin helicopter, flying level, and heading approximately in the opposite direction displaced about 600-800m to their R, under the cloud and outside the rim of the gap through which they had just descended. Having reconfirmed their position to be outside the Benson MATZ by GPS, he informed APP that they were visual with the Merlin and commenced their recovery to Benson. He assessed the risk as *"low"*. His aeroplane is coloured white with a blue flash on the fuselage; the white HISLs and nav lights were on. A squawk of A3621 was selected with Mode C. Mode S was 'on' but neither TCAS nor any other form of CWS is fitted.

**BENSON DIRECTOR (DIR)** reports that the Benson Watchman SRE was in use with SSR data fed from Brize Norton and he was operating under a "*low*" workload. One Merlin helicopter was under a RIS, squawking A3610 with verified Mode C, steady on a heading of 040° and had been for some 10-15nm. The Merlin was level at 1800ft (1014mb) [equating to 2010ft London QNH (1021mb)] and ahead were 2 Grob Tutor ac both squawking A3621 [a

verified squawk assigned to Benson]. Both ac were called under the RIS, one being well above [4300-4500ft London QNH 1021mb)] the Merlin and the other 2000ft above. As the contacts of the subject Merlin and Grob Tutor ac merged together the Mode C readouts seemed constant from both Tutor ac. However, as the Merlin pilot called on RT to report that the Tutor had just passed by at close quarters, the subject Tutor's Mode C readout changed to indicate 100ft below. The Merlin pilot reported that the Tutor had passed within 300ft of his helicopter so he immediately attempted to gain identification of the reported Tutor ac from the APP controller and passed the details to the ATCO I/C.

**BENSON SUPERVISOR** reports that there was 1 ac under DIR's control when the two conflicting Tutor ac - both under Benson APP's control under a FIS - were called to the Merlin pilot. One of the conflicting Tutor ac then appeared to descend rapidly as the ac's Mode C readout went from well above to a similar level to the Merlin, descending he thought in one update of the SSR. DIR was using a 20nm displayed range and all equipment was fully serviceable, but before DIR had the opportunity to call the conflicting descending Tutor ac again, the Merlin pilot reported that the Tutor had just passed within 300ft in front of him.

**MIL ACC** reports that the Merlin helicopter was under the control of the Benson DIRECTOR [DIR] in the radar training circuit, conducting PARs under a RIS. The subject Grob Tutor ac was conducting general handling (GH) some 8nm NW of Benson receiving a FIS from Benson APP on 376·65MHz.

The Merlin crew established contact with DIR on 356·125MHz at 1127:56. The ac was identified and the flight placed under a RIS. When 'admin' calls relating to the PAR procedure were complete, DIR called traffic information to the Merlin crew at 1129:10, *"…traffic 12 o'clock, 2 miles, manoeuvring, Tutor aircraft well above* [the subject Grob Tutor at 5100ft London QNH]*".* At 1130:41 further traffic information was called *"…further traffic 12 o'clock 3 miles tracking south indicating 2000 feet above"* [another Grob Tutor at 4300ft London QNH] which the Merlin pilot acknowledged. Although this Grob Tutor ac was in close proximity to the incident, it had no bearing on the Airprox.

From the LATCC (Mil) Heathrow Radar recording, the subject Grob Tutor can be seen manoeuvring to the N of the Merlin indicating some 2000ft above the helicopter. The Grob's Mode C then disappears and was last shown at an altitude of 4100ft London QNH (1021mb). The remaining primary return shows the Grob Tutor commenced a R turn before fading on the Heathrow Radar recording. The Grob Tutor then reappeared after 4 further radar sweeps in the Merlin's 12 o'clock at a range of about 0·4nm indicating 2800ft London QNH Mode C; subsequent returns indicate that the Tutor was still descending.

At 1130:56, DIR instructed the Merlin crew to *"..turn R heading 100°"* which the Merlin pilot acknowledged. However, some 24sec later the Merlin pilot reported "*er.*.[C/S] *that Tutor just passed within about approximately 3 hundred feet of this aircraft".* DIR acknowledged the report and 18sec later, after instructing the Merlin pilot to turn R onto a heading of 150°, added that "[C/S] *we're identified (sic) the Tutor and erm give us a call when you land".* The Merlin continued the approach without further incident.

This Command considers that there were no causal or contributory factors to the Airprox as DIR correctly applied a RIS iaw JSP 552.

UKAB Note (1): During the investigation of this Airprox it was determined that Benson ATC had neither impounded the recording of the APP frequency 376·65MHz nor obtained a report from the APP controller immediately after the Airprox had occurred, despite being aware that an Airprox had been filed that same day by the Merlin pilot. Thus there is no data available relating to the ATS provided by Benson APP to the Grob Tutor crew.

UKAB Note (2): Analysis of the LATCC (Mil) Clee Hill radar recording at short range reveals that the Grob Tutor is shown clearly as it descends through an altitude of 3700ft London QNH (1021mb), at L 11 o'clock – 1nm to the Merlin which is shown on a steady track of 040° downwind maintaining 2000ft London QNH (1021mb) throughout. The helicopter initiates a R turn to track about 085° as the Grob descends through 3300ft QNH and closes on a steady SE'ly course at 1131:04 as the range closes to 0·8nm. As the Merlin steadies, the Grob turns R more southerly for a short while in the Merlin pilot's 11:30 position about 0·5nm away, some 900ft above the helicopter. The Grob Tutor then crosses through the Merlin's 12 o'clock from L to R in between sweeps where it is next shown in the helicopter pilot's 12:30 position at the CPA of 0·3nm – 600yd – some 300ft above the helicopter and probably the point at which its pilot first saw the aeroplane. The Grob is then shown 100ft below, in the Merlin's 4 o'clock

at 0·4nm, after descending through the helicopter's altitude. The Grob then descends further as it draws aft of the Merlin which turns onto a track of 100°.

**HQ JHC** comments that this Command agrees that in relation to the procedural aspects of this incident there were no causal or contributory factors in this Airprox. The Merlin was operating under a RIS that was correctly applied by DIR. The Tutor QFI, operating under a FIS from APP, identified what he believed to be a suitable gap in the cloud cover and descended heading away from the Benson MATZ, through this gap. The speed of the descent through cloud by the Tutor gave the DIR no opportunity to call the confliction to the Merlin crew. However, in light of the 'low' workload on DIR, it is slightly concerning that 2 ac being controlled by the same ATSU, in a relatively quiet piece of airspace came so close to each other. Finally, that ATC did not impound the RT recording or immediately obtain a report from the APPROACH controller meant that the data available to this investigation was less than complete.

**HQ AIR (TRG)** comments that both ac were properly going about their business in Class G airspace. As the Tutor crew were specifically searching for conflicting traffic they were not as concerned as the Merlin crew who saw the Tutor late as they were flying close to the cloud base in IMC.

## PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Whilst recognising entirely the limit of the responsibilities of the controllers under the respective ATSs here, for an Airprox to occur between two Station-based ac receiving ATSs from controllers sitting adjacent to one another was slightly discouraging to controller Members. Moreover, the absence of a report from the APP controller or a transcript of the APP frequency was most unfortunate. The Board had to accept that the ATC aspects of the investigation were perhaps somewhat incomplete in respect of the ATS provided by APP which was a FIS, the Grob QFI reports. But within this Airprox were several important lessons for the unwary – pilot and controller alike.

From the ATC perspective, Members postulated whether the Grob's descent should have been apparent to the controllers. It would seem that neither the APP controller's nor evidently the DIR's scan had detected the light ac's rapid descent from its Mode C indication that, the Supervisor opined, seemed to occur in one sweep of the radar. Though working only one other flight in the vicinity – the second Grob - and albeit that the ATS provided to this flight was unknown, APP did not appear to have been very busy at the time. Equally, DIR had only the Merlin to contend with and was reported to be operating under a "*low*" workload. The Mil ACC Advisor emphasised to the Board that the recorded Clee Hill (and Heathrow) Radar data used during the investigation (and to illustrate the encounter here for the benefit of the Members) was not the same as that displayed at Benson - this ATSU is equipped with its own Watchman primary SRE but receives its SSR data from the Brize Norton SSR head. The Board accepted this point entirely. The greatly expanded scale available when replaying the radar recording for the Airprox investigation had made the Grob's descent readily apparent but clearly the controllers would not have been operating at this very short range. Nevertheless, it was pointed out that the recorded Clee Hill data - a long range area radar equipment sited in excess of 60nm from the Airprox location with a slower rotation rate than that of the Benson Watchman - clearly displayed the Grob's descent before the CPA which occurred a mere 9·2nm to the NNW of the aerodrome. This airspace should have been within theoretically solid primary radar coverage of the Benson Watchman, which should have given good positional information and better close range discrimination at a faster update rate. Furthermore, at only 15nm from the Brize SSR, the Mode C data displayed to the Benson controllers should also have displayed the Grob's descent to DIR over more sweeps than that of the Clee Hill, if the equipment was operating satisfactorily. No areas of known poor radar coverage were mentioned and it was evident from the Supervisor's report that the ATC equipment was fully serviceable. Thus the radar returns shown on the diagram before the CPA were potentially indicative of what might have been displayed.

DIR, sensibly using a 20nm displayed range, was passing traffic information under the RIS that pertained as the Grob had been called beforehand but it was evident to the Members that the controller had not appreciated that the Grob had descended in extremely close proximity to the helicopter until its pilot reported sighting the aeroplane. Whether it would have been appropriate for APP to have recognised the Grob's descent and issued a warning to the pilot about the close proximity of the Merlin, it was not feasible to determine with certainty. Good practice would suggest that the APP controller might have issued a warning to the Grob pilot - even under a FIS

– if the LA had been detected descending toward the helicopter. But it would seem from the Grob pilot's account that he had been oblivious to the presence of the helicopter until after he had initiated his descent through the hole he found in the cloud. It therefore seems that APP had not observed the descent and no such warning was given.

From the Merlin pilot's perspective, having been informed by DIR that the Grob was manoeuvring well above, it was understandable that he would have been somewhat surprised to spot the aeroplane descending through his altitude after it crossed ahead. Whilst an update had not been specifically requested under the RIS, with manoeuvring traffic it might have been wiser to ask for updates on traffic in such close proximity - a salutary point. Furthermore, an HQ Air Member questioned the wisdom of operating this close to the base of cloud under IFR with only a RIS to supplement the crew's lookout. Whilst perhaps stating the obvious, not flying so close to cloud, when at all feasible improves a pilot's ability to spot conflicting traffic in better time to avoid it. The Board was intimately familiar with the limitations of a RIS, insofar as the pilot is responsible for the separation against traffic whether or not the controller has passed traffic information, so an experienced QFI Member queried whether the Merlin pilot was indeed able to fulfil his responsibilities to 'see and avoid' in Class G airspace. When flying 200m clear of and 50ft below cloud in intermittent IMC, the potential for spotting any other traffic was reduced and Members believed operating IFR under a RIS - which is essentially a VFR radar service where aircrew are required to afford visual separation over reported traffic – was perhaps unwise. As it was, the Merlin crew were plainly unable to spot the Grob above cloud before it descended and thus they were merely complying with the controller's instructions and heading in the direction that DIR told them to fly with the result that they were powerless to prevent the conflict. Members also postulated that if the Merlin crew had requested a RAS whilst being vectored for the PAR, this might have prompted DIR to effect co-ordination with APP and vertical separation against the Grobs might have been arranged for the short period the helicopter was in the vicinity - which was still feasible even under a RIS. Whilst some thought that potentially an improved ATS might have forestalled this Airprox, controller Members were in no doubt that as DIR had not spotted the descent from the Grob's displayed Mode C, or for some unexplained reason it was not actually displayed to him, no avoiding action advice would have been forthcoming.

Turning to the Grob pilot's part in this Airprox, it was explained that airspace in this vicinity is quite confined and locating sufficient room to conduct aerobatics and general handling under VFR on a cloudy day could prove difficult. Clearly, pilots would not want to roam too far away from their base. However, the potential for a conflict with instrument traffic whilst descending through a hole in the cloud in the vicinity of the radar pattern should have been readily apparent to the Grob pilot. Whilst from above the camouflage green Merlin would have been difficult to see in any case, a pilot Member opined, the Grob pilot's candid account had shown that he was completely unaware of the presence of the large helicopter - flying just below the cloud at this point - before it approached the hole through which he had committed to descend. Clearly the Grob pilots' diligent scan of the hole in the cloud into which they descended would not have revealed anything just outside the rim underneath – which is plainly where the helicopter was lurking unseen. Whether the Grob pilot had communicated his intention to descend to APP beforehand was not evident, for if he had then the controller would surely have advised his DIR colleague alongside. However, the Grob pilot's account revealed that he had advised APP when the Merlin was spotted about 600-800m to the R and at that point the radar suggests the Grob was just 300ft above the helicopter, still descending rapidly. Again Members questioned whether the Grob Tutor QFI was able to fulfil his responsibilities of 'seeing and avoiding' other traffic in good time and patently he had not seen the Merlin until he had crossed ahead of it and the helicopter was drawing away astern. Members concluded, therefore, that this Airprox had resulted from effectively, a non-sighting by the Grob Tutor pilots.

The close proximity evident here, without either pilot taking positive action beforehand to avert this situation, were factors that weighed heavily when assessing the Risk. Any separation that did exist here was not engineered and was thus purely fortuitous. None of the pilots, nor either of the controllers, had done anything to prevent this close quarters situation from developing. With this in mind and neither pilot able to effect the outcome, the Board concluded unanimously that the safety of the ac involved here had certainly been compromised.

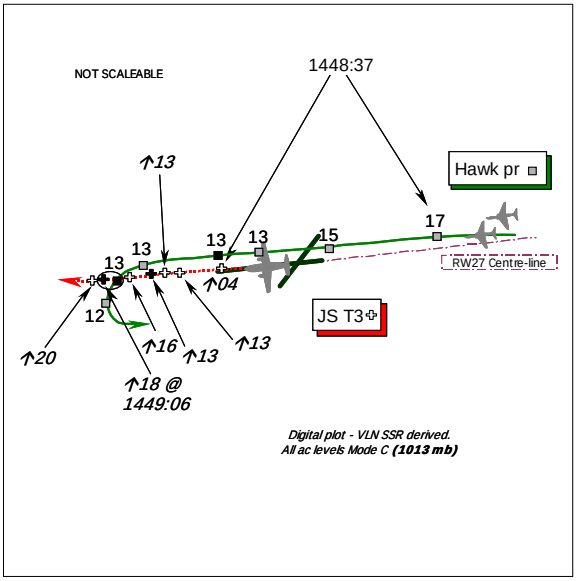
## PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Effectively, a non-sighting by the Grob Tutor pilots.

Degree of Risk: B.

# AIRPROX REPORT NO 023/08

| | | |
|---|---|---|
| *Date/Time:* | 26 Feb 1449 | |
| *Position:* | 5101N 00238W (Yeovilton RW27 cct - elev 75ft) | |
| *Airspace:* | MATZ/ATZ | (Class: G) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | Hawk T1 pair | Jetstream T3 |
| *Operator:* | COS Avn | COS Avn |
| *Alt/FL:* | 1000ft | Departing |
| | QFE (1006mb) | QFE (1006mb) |
| *Weather* | VMC CAVOK | VMC NR |
| *Visibility:* | >10km | 10km |
| *Reported Separation:* | | |
| | Nil V/200m H | NK |
| *Recorded Separation:* | | |
| | Not scaleable | |




## PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

**THE HAWK T1/A PILOT** reports he was leading a section of 2 Hawks returning from a training sortie on a 'visual' recovery to Yeovilton, inbound at 350kt, for a VFR visual pair's 'run-in and break' to join the cct and land. In communication with TOWER on UHF 375·575MHz, on passing 'INITIALS' [the Initial Point (IP) positioned 3nm on the extended centreline at 1500ft QFE] for RW27, the controller informed them, iaw routine SOP's, of other traffic in the cct. A Chipmunk was joining visually on the extended centreline for RW27 at about 4nm and a Grob was positioned DOWNWIND in the light ac cct for RW27 at 800ft. No other traffic was notified to them, he thought, so he elected to delay the 'BREAK' slightly to achieve separation on the Grob DOWNWIND. Heading 270° just at the commencement of the 'BREAK' overhead the A/D level at 1000ft QFE (1006mb), a Jetstream was sighted about 300m away 15° L of the lead ac, in the climbout for RW27, heading W, at a height of 1000ft QFE. To avoid the Jetstream, the rear-seat Captain of the lead Hawk took control of the ac and executed a hard 5g descending 'BREAK' to the L as his No2, whose pilot had also seen the Jetstream, executed a similar manoeuvre. He assessed the risk as *"high"* and reported the Airprox to ATC and his CO after landing.

His ac has a high conspicuity black colour-scheme and the red 'strobes' were on. SSR was selected off. Neither TCAS nor any other form of CWS is fitted.

**THE JETSTREAM T3 PILOT (JS T3)** reports he was departing from Yeovilton for Glasgow and took-off from RW27 whilst under the control of TOWER on UHF 375·575MHz. Operating under IFR, single pilot, he climbed-out on a heading of 266°(M) at about 120kt in VMC. The other ac flown by the reporting pilot was not seen at all and he was only aware of the Airprox upon arrival at his destination: thus he was unable to assess the Risk or the minimum separation. The HISLs were on but neither TCAS nor any other form of CWS is fitted

**THE YEOVILTON AERODROME CONTROLLER (ADC)** reports that he was Mentor to an experienced controller conducting revalidation training in Aerodrome Control and had been in position for about 1hr 30mins. The weather conditions were good with visual recoveries and departures in force although the wind was quite strong, gusting up to 20kt.

Having received a pre-note that the Chipmunk was joining, they cross-coupled both UHF TOWER – 375·575MHz with VHF 122·1MHz – NATO TOWER VHF common. ADC was controlling 3 helicopters departing the airfield, 2 to the N and one to the SW, with a Grob Tutor operating in the visual cct to RW27. The Chipmunk pilot called for a straight-in visual approach to RW27 from approximately 5nm to the E and was given his joining instructions. Shortly afterwards the leader of the Hawk pair called for a join through INITIALS. Each ac was given details of the traffic in the cct at the time and the whereabouts of the joining ac.

## AIRPROX REPORT No 023/08

The Jetstream was holding at the RW27 holding point and its pilot reported ready for departure. He was instructed to HOLD. The Grob then reported FINALS and was given clearance to ROLL. Once the Grob had passed the threshold, the Jetstream pilot was instructed to LINE-UP. The Grob then cleared the runway and the Jetstream pilot was given clearance to TAKE-OFF. The Hawk leader reported INITIALS and was then passed the position of the Grob DOWNWIND and informed of the Jetstream on for departure. A prompt to his trainee to pass the surface wind to the Hawks was required. The Hawks were then seen to BREAK into the cct over Yeovilton village at which point the Duty Air Traffic Control Officer [DATCO – Supervising Officer-in-Charge of the VCR staff and the aerodrome] commented on how fast they were going. The Hawks then joined the cct and the Jetstream departed, its pilot changing frequency to APPROACH without comment.

Neither he as the ADC, nor the DATCO, were aware that any incident had occurred until a phone call was received to say that the Hawks had to take avoiding action on the Jetstream.

**SATCO YEOVILTON** reports that the Yeovilton ADC position was manned by a revalidating trainee controller (who had previously operated at Yeovilton) and an experienced Mentor acting as the 'screen'; the ADC team had been in position for approximately 1:30 hr. The airfield was operating to 'Duty' RW27 in excellent weather conditions (CC:BLU/BLU), although there was a relatively strong 20kt westerly wind. The Yeovilton 1450 METAR was:

280/22KT 9999 FEW 020 QNH1009 BLU NOSIG. QFE was 1006mb.

The workload for the ADC team had been steady throughout the period and they had been making full and effective use of the training opportunities that existed. At the time of the occurrence there were 3 helicopters on frequency (VFR and IFR flights) and a Grob Tutor flying circuits. The ADC had been advised of the imminent arrival of a station based Chipmunk joining from the E and the pair of Hawks approaching from the NW led by the reporting pilot. As the Chipmunk was 'VHF only', ADC cross-coupled the UHF Yeovilton TOWER frequency with the VHF NATO Common TOWER frequency which is a standard practice at Yeovilton when operating 'VHF only' equipped ac. The Jetstream was taxying from its dispersal to the RW27 Hold position under control of the Yeovilton Ground controller.

At 1445:34, the pilot of the Jetstream, changed to the UHF TOWER frequency, reported *"...ready for departure"* and was instructed to HOLD because the Grob was commencing its FINALs turn. The Grob was cleared to ROLL and shortly afterwards, at 1446:05, the Chipmunk pilot called to join *"...long straight in."* ADC passed joining details to the Chipmunk pilot *"...runway 2-7, QFE 1-0-0-6, 1 Grob in the circuit."* Following the Chipmunk pilot's acknowledgement, ADC added *"...we've got er 2 Hawks joining from the north west shortly and I'll have 1 Jetstream on departure after the Grob's passed through."* Immediately after this exchange, at 1446:32, the pilots of the Hawk formation checked in on the frequency and the lead pilot called to 'join'. ADC replied "[Hawk formation C/S] *Yeovil TOWER, join runway 2-7, QFE is 1-0-0-6, 2 in* [ac in the cct]*, 1 Chipmunk long finals for runway 2-7, 1 er Grob er rolling on the runway now."* The runway and QFE were acknowledged by the lead Hawk pilot following which, at 1446:52, ADC instructed the Jetstream pilot to LINE-UP; the Jetstream pilot acknowledged this call. At 1447:02, the Chipmunk pilot reported that he was 'just approaching' Corton Ridge which is a ridge of high ground about 5nm E of the airfield; ADC acknowledged this and, re-transmitting this positional information, asked the Hawk formation *"...did you copy?"* to which the Hawk leader responded with his formation callsign. ADC passed the Jetstream pilot his SSR code (A0210) and then 6sec later at 1447:21, the TAKE-OFF clearance "[Jetstream C/S] *clear TAKE-OFF, 1* (the Grob) *in the climb out, surface wind is 2-7-0 at 23"*. At 1447:31, the Jetstream pilot requested that the squawk be repeated and ADC replied *"Squawk 0-2-1-0 you are clear TAKE-OFF, 1 in the climb out, surface wind..."* The Jetstream pilot replied *"Roger 0-2-1-0 clear TAKE-OFF,* [Jetstream C/S]*"* at 1447:38. Immediately after this, ADC transmitted to the pilot of the Grob "[Grob C/S] *request an early left hand turnout please."* At about this point, the ADC saw the Hawks flying through a 'RIGHT BASE' position and (he thought) well inside the normal IP.

At **1448:01**, the lead Hawk pilot transmitted "[Hawk formation C/S] ***INITIALS for the break****"* and ADC replied **"[Hawk formation C/S]** ***roger, 1 er rolling out for take off*** [the Jetstream]*, 1 Grob downwind and one Chipmunk long finals."* At this point, the Mentor prompted his trainee to pass the surface wind information [280°/25kt], which he did shortly afterwards, although the initial part of the transmission was distorted (squeal) due to a simultaneous transmission from what is presumed to be the lead Hawk pilot. At 1448:15, the Grob pilot reported *"...DOWNWIND, glide roll"* and ADC advised him that there was *"...1 ahead, Chipmunk."* The Chipmunk pilot immediately responded *"(C/S) negative, we haven't called yet, we're still er 4 miles out"* and hence, ADC informed the Grob pilot that he was *"...number 1 for the runway."* ADC then cleared a helicopter departing to the S for TAKE-

OFF from the threshold of RW04 and following this, at 1448:51, the Jetstream pilot reported changing frequency to APPROACH. Immediately afterwards, the Grob pilot reported that he was on FINAL, and was cleared to ROLL at 1449:01. At about this point, the Hawk pair were seen to 'break' into the cct, although the 'break' was much later than is normally done (to the ADC, they appeared to turn over the Yeovilton village church, about ¾ of the way down the RW), and the DATCO remarked to the VCR staff that they appeared to be travelling much faster than usual. At 1449:12, ADC requested the Chipmunk pilot to *"...report long finals with intentions"* to which the pilot responded that he was conducting an orbit at the IP. The next transmission from the lead Hawk pilot was at 1449:42, when he reported *"...FINALS, gear down, Chipmunk position please?"* No mention of an Airprox was made on the RT.

About an hour later, the Hawk unit telephoned ATC to discuss the 'incident', following which it was concluded that an Airprox would be filed and the necessary reporting action commenced.

The recording of the Yeovilton SSR (primary radar is not recorded) shows the Airprox in reasonable detail although it is stressed that the positional information provided by SSR is not sufficiently accurate to be able to properly assess minimum horizontal separation. The lead Hawk, squawking A0201 is shown rolling out on the RW27 centreline at 2·5nm whilst descending through about 2500ft Mode C (1013mb) and the Jetstream, squawking A0210, can be seen on the ground at the eastern end of the RW; its Mode C indication of 002 (1013mb) is commensurate with the QFE of 1006mb. [UKAB Note: Equivalent heights QFE (-210ft) rounded to -200ft are specified hereafter with the actual indicated Mode C level (1013mb) in parentheses.] At 1448:28, the Hawk is 1·75nm E of the threshold, descending through about 1800ft QFE (2000ft Mode C) and the Jetstream is a little over half way along the RWY but with no discernible climb as yet. At 1448:51, the time that the Jetstream pilot left the frequency, the Hawk is fractionally N of the RW centreline in the vicinity of the RW intersection and the Jetstream 0·5nm in the climb out; both ac are indicating the same height of 1100ft QFE (013 Mode C) with the Jetstream 1·25nm W of the Hawk. In the next sweep, the Jetstream is about 300ft above and in the Hawk's 11:30 position at a range of about ½nm (Hawk indicating 013 Mode C, Jetstream indicating 016 Mode C). The CPA occurs at around 1449:06 in a position about 1nm W of the end of RW27; the Hawk in level flight at 1100ft QFE (indicating 013 Mode C) appears to pass slightly N of the Jetstream which is climbing through 1400ft QFE and then 1600ft QFE in the next sweep (indicating 016 and then 018 Mode C respectively). The following radar sweep, timed at 1449:11, shows the Hawk slightly to the S of the Jetstream having broken L into the cct at 1000ft QFE indicating 012 Mode C in an apparent descent with the Jetstream indicating 600ft above it and still climbing.

Initially, it was difficult to ascertain exactly how the two Hawks, joining for a 'run and break' over the airfield at 1000ft, could have ended up in the same piece of sky as the departing Jetstream. Jetstreams are normally only seen to be at about 400-500ft aal by the time they have passed over the upwind end of the RW and hence are always well below any ac breaking into the circuit; this Jetstream's departure did not appear to have been any steeper than usual. The 'BREAK' position for RW27 is published within Yeovilton Aviation Orders (YAvOs - the equivalent of the Flying Order Book) as being over the RW27 threshold although in practice ac tend to 'BREAK' closer to the RW intersection (about one third of the way along the RW); even if the 'BREAK' is delayed a little later than this, there should still be sufficient clearance from departing ac. From the radar replay however, it is clearly evident that the 'BREAK' was delayed significantly longer than is normal which led to all three ac being in a similar position at a similar height.

When the Hawks checked in on the TOWER UHF frequency, their pilots were provided with the 'routine' joining information by the ADC (RW in use, QFE and number of ac in the circuit). The information provided, painted an accurate picture of the airborne traffic situation that was pertinent to the Hawks at the time. Prior to this, it should also be noted that the crew of the Chipmunk, which was joining 'straight-in', were made aware of the imminent arrival of the Hawks who were expected to join through the IP - a point 3nm on the extended centreline at 1500ft QFE and hence were likely to be a factor to the Chipmunk. The next notable point for ATC during a FW ac's visual join is at the IP, when the pilots are passed surface wind information and are updated on the positions of the traffic in the cct; this cct information is passed in the order that the joining ac is expected to encounter the other ac. Normal Mil ATC practice is to pass this information in terms of 'numbers of ac' (Eg. 1 on FINAL, 2 DOWNWIND, etc) and this is how it is done at Yeovilton. Due to the known conspicuity issues associated with the Grob Tutor however, it is a standard practice at Yeovilton to specifically identify Grobs (or similar) by ac type when passing TI regarding them to other pilots. It is also good practice to specify the ac type when an ac is operating on VHF (Yeovilton does not currently have a dedicated Tower VHF frequency; the NATO common frequency is used and hence there is sometimes the potential for interference from other military airfields which may deny the use of cross-coupling). In this case, the ADC provided information about one ac taking off and specifically identified by

type the ac that were DOWNWIND and LONG FINAL, this appears to be very clear when the RT transmissions are listened to. The trainee did not pass the required surface wind information, but was immediately prompted by his Mentor to do so. This is a clear indication that the Mentor was properly monitoring the session and that he had checked the transmission, identified the elements that were missing, and had corrected his trainee's error.

It should be noted that in the time period that the Hawks were on the TOWER frequency, the Jetstream pilot made 4 separate RT transmissions and ADC made another 5 to the Jetstream pilot; a number of these calls referred to the TAKE-OFF clearance itself. The Jetstream, which is one of the ac based at Yeovilton, has a fairly distinctive RT 'sound' when compared to other station based ac (although it is accepted that this may not be so noticeable within a Hawk), and was using a distinctive C/S (NAVYxxx) which, even when shortened to just the numeric element of the C/S, is clearly distinguishable from the other airfield operators. It is thus considered that there should have been sufficient indication of the Jetstream's presence on the RT for the Hawk pilots. Nevertheless, it is evident that the lead Hawk pilot did not absorb this or the information passed to him at the IP and hence was unaware of the Jetstream's presence.

It is worthwhile examining whether the RT procedures at the IP need to be modified in order to ensure that the cct information is much more obvious to all pilots. A specific mention of the Jetstream by its type eg..***1 Jetstream*** *departing..* may have been the trigger that would have alerted the lead Hawk pilot to its presence. However, this is not the normal military ATC practice and would result in the need to routinely name every ac type flying within the cct. Alternatively, a reiteration of the number of ac in the circuit eg. *C/S* ***3 in****, surface wind…1 turning final, 2 downwind...*) may register in the pilot's mind that, whilst he has sighted 2 ac, there is still another to be found. Thus, the following options regarding the passage of TI to ac joining the visual circuit have been suggested to the **local** fixed-wing operators at Yeovilton:

a. No change - the current procedures have served us adequately over a long period of time without any apparent problem previously.

b. Specify all ac in the cct by type as well as position in the 'post IP' call

c. Reiterate the number of ac in the cct in the 'post IP' call, before passing the surface wind and traffic position information.

d. Adopt *both* options b and c.

Whilst this could be agreed locally, the resultant change would also need to be adopted throughout Mil ATC in order to ensure consistency and the options are therefore forwarded to FLEET and HQ Air for further consideration. It should of course be noted that some changes could prove counter-productive in terms of RT transmission lengths, particularly in multi ac type circuits.

With regard to the Hawk formation's join into the visual cct, the laid down procedure in YAvOs is as follows:

Fly through the IP (3nm, 1500ft QFE). Once visual with all circuit traffic, descend to circuit height (1000ft, 800ft for light ac) on the dead side and then perform a level break in the direction of the circuit pattern. Once the ac are seen to descend to circuit height, it is assumed by ATC that their pilots have the circuit traffic in sight and will therefore adjust their circuit spacing accordingly.

It was noted by the DATCO at the time, and later also remarked upon by the radar controllers, that the Hawks appeared to join the cct at a notably higher speed than usual; this is also evident in the radar replay, which shows the ac still descending as they turn slightly inside the 3nm range of the IP. Whilst there is no 'speed limit' for cct joins and the weather around the airfield was very good at the time, it gives the impression that the join was unnecessarily rushed. If the lead Hawk pilot was concentrating on looking for the Grob (DOWNWIND) while joining, he should have (a) remained at 1500ft QFE, and (b) requested an update on the position of the Grob (or all of the cct traffic) from the ADC. Irrespective of whether or not he had sighted the Grob, had he transmitted his intentions to extend further upwind before 'BREAKING' (in order to provide adequate spacing behind the light ac), this *could* have prompted the ADC to reconsider the proximity of the Jetstream and hence, transmit an extra warning to the Hawk pilot.

The ethos of military cct control is that the controller provides the pilots with the necessary information and instructions to enable them to integrate themselves appropriately into the visual cct and that it is the responsibility of the pilots to space themselves accordingly in the cct. There is also an expectation placed upon the pilots to listen out to the other RT transmissions within the circuit in order to enable them to generate an appropriate level of situational awareness. This, coupled with the excellent weather conditions that existed on the day, and the fact that appropriate RT information was passed to the Hawk pilots, leads to the conclusion that there is nothing in the way of a causal factor that can be attributed to the action, or inaction, of the controllers involved in this Airprox.

Unit Recommendation:

In order to give a better opportunity of pilots absorbing all of the relevant TI passed to them at the IP, the following suggestions are passed to FLEET and HQ AIR for consideration for adoption Mil ATC 'wide'.

a. Specify all ac in the circuit by type as well as position in the 'post IP' call - eg...surface wind …*1* ***Jetstream*** *departing, 1 Grob downwind etc...*

b. Reiterate the number of ac in the circuit in the 'post IP' call, before passing the surface wind and traffic position information - eg *C/S,* ***3 in****, surface wind…1 departing, 1 downwind, 1 long final...*.

c. Adopt *both* options - eg *C/S,* ***3 in****, surface wind…1 Jetstream departing, 1 Grob downwind, 1 Chipmunk long final etc...*

At present, option b is considered to be sufficiently effective without adding to unnecessary RT loading.

**MIL ACC** comments that the Unit investigation was comprehensive and had nothing further to add.

**THE UNIT** comments that the procedure laid down in Yeovilton Air Orders (YAvO) for aircraft joining via initials for a run in and break states:

Run and Break. Fixed wing jet aircraft should normally join the circuit through the initial point, positioned 3 miles on the extended centreline of the approach to the duty runway at 1500ft QFE. Once visual with all circuit traffic, aircraft are to descend to circuit height of 1000ft QFE prior to breaking downwind. The break position for Runway 27 is deadside abeam the runway threshold...

However, it is clear from the report that:

The Hawk crews did not register the 6 transmissions regarding the Jetstream taking off, including the transmission by the ADC to the Hawk formation - *"roger, 1 er rolling out for take off…"*. Whilst this last transmission by the ADC could have been clearer, there was sufficient information available on the aircraft flying within the circuit area and taking off to enable the pilots to achieve a safe, orderly and expeditious join.

Whilst the Jetstream was not in the visual circuit, it was conducting a Visual Departure in accordance with YAvO, which requires fixed wing aircraft to *…Climb straight ahead until clear of the circuit...* The pilots of the Hawk formation should have known this procedure.

The Hawk pair descended to 1000ft QFE without the required visual identification of all circuit traffic.

The Hawk leader elected to extend the break position by a considerable distance in order to create separation on the Grob aircraft in the circuit. This delay was not transmitted to the ADC.

It was concluded that the Hawk formation did not conduct their visual join procedure in accordance with YAvO. Furthermore, the extant visual join procedure detailed in YAvO should be robust enough to prevent this kind of occurrence. However, the lead Hawk pilot should be lauded for identifying this Airprox and allowing others to learn from this incident.

**NAVY COMMAND** concurred with the Unit's comments.

## AIRPROX REPORT No 023/08

### PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It was evident to the Members that the lead Hawk pilot had conscientiously reported a relatively unusual encounter in military ccts and highlighted for the benefit of many what can happen, suddenly, during fast paced but seemingly well co-ordinated routine flying operations. The Board echoed the Unit's comments, for here was a lesson for all - pilots and controllers alike - of the evidently unexpected that should not have been so. Moreover, the Board commended the Unit for its comprehensive and exceptionally thorough analysis of this occurrence which had highlighted the salient points. Clearly considerable effort had been expended to draw out lessons for the maximum benefit of the aviation community as a whole.

It was clear that the issue of RT phraseology had figured large in this investigation and effective two-way communication was at the root of this Airprox. The many worthwhile suggestions made by the Unit had been reviewed, the Board's Mil ACC Advisor explaining that military RT phraseology is formulated for use NATO wide. Whilst noting the Unit's recommendations, at this stage Air Command had elected not to formulate a change to NATO visual cct phraseology on the basis of this one Airprox alone. The Navy Command Member concurred with this view, adding that the regulations and SOPs are perfectly clear. If pilots and controllers take heed of what is said there seemed little need for change based solely on this one occurrence. Whereas the phraseology used by the trainee ADC might have been a little clearer, the Navy Member opined, it did comply with standard military practice. Even so the words used could have been a little more descriptive about the Jetstream as it was plain that the Hawk pair had arrived in the cct area without recognising that there was a Jetstream departing in their vicinity at all. The phrase used by the ADC - "*..1 er rolling out for take off..*" - in reply to the Hawk's call at the IP seemed unusual when combined with information about an ac taking-off; in isolation "*..1 er rolling out..*" conveyed to some Members the sense of an ac rolling out from a landing and exiting the Duty RW. Conceivably, if the Hawk pilots heard only this part of the transmission they might have discounted this item of traffic information as it would not be relevant by the time they entered the cct. But this was not at all clear as the transcript evinced only an RT *"squeal"* of apparently crossed radio transmissions at the point believed to be the subsequent acknowledgement from the lead Hawk pilot. Whilst this was just conjecture, no other explanation had been offered as to why the Hawk pilots had not registered this essential item of traffic information and entered the cct area unaware of the departing twin turboprop Jetstream. Some questioned whether the cct join was at all hurried: it had been stated that the pair had turned inside the normal IP and were evidently slightly R of the RW centreline throughout the 'run-in', breaking significantly later than the accepted norm, the radar recording and Unit report reflected. But it was evident to pilot Members that the lead Hawk pilot was concerned that he did not encroach too much on the Grob Tutor in the LA cct, as highlighted by both the leader's report and the Unit's comments. Whilst the LA cct sensibly provided an element of vertical separation beneath the normal FW visual cct height of 1000ft QFE, pilot Members recognised that if the spacing decreased too much it could result in bunching in the cct with the pair potentially having to 'go-around' from FINALs whilst also contending with the Chipmunk. [It was appropriate to note here for the benefit of other Grob pilots that at Yeovilton 'Glide rolls' executed by Grob ac are flown at the LA cct height of 800ft, not the more usual 1500ft.]

In one highly experienced Member's view, himself a QFI, the correct established 'break' position abeam the threshold for RW27 would be difficult to comply with and the 'slippery' nature of the aerodynamically-efficient Hawk jet was stressed. Considerable debate ensued about the factors underlying the established 'break' positions promulgated in local orders – originally conceived for SHARs - and the difficulties of fitting in the FW jet cct around the noise sensitive areas of Yeovilton Village itself and Ilchester that YAvOs mandated were to be avoided. Having overflown the aerodrome and initiated the 'break' where he did, pilot Members were keen to point out that the Hawk leader was following standard military teaching by extending UPWIND, rather than widening the cct pattern or extending DOWNWIND which was to be avoided at all costs. Pilots should be in no doubt that ATC will expect them to comply with SOPs and any divergence from established norms at this complex, mixed traffic aerodrome – such as joining for a delayed 'break' - certainly warrants a 'heads-up' to TOWER beforehand that might in turn have elicited a warning from the ADC. So the lesson here is: if you intend to extend UPWIND or delay the 'break', good airmanship dictates that TOWER is informed in good time beforehand - a point stressed by the Unit. From his forthright account it was evident that the lead Hawk pilot was completely unaware of the departing Jetstream and neither of the Hawk pilots had registered the turboprop's presence in the climb-out before they joined the cct.

Members agreed unanimously that this Airprox had resulted because the Hawk leader did not integrate his formation safely into the visual cct.

From his perspective, the Jetstream pilot was plainly unaware of the close proximity of the Hawks as they 'broke' into the cct close astern and he played little active part in this Airprox. From the Yeovilton digital SSR recording alone, it was not feasible to accurately gauge the horizontal separation that existed between the Hawk formation and the Jetstream just before the jets turned L into the cct but there was no reason to doubt the veracity of the lead Hawk pilot's assessment of 200m. It was also clear from the lead Hawk pilot's candid account that the Jetstream was not spotted until it was barely 300m away, just L of the nose, level with the jets as the departing twin climbed up through their height of 1000ft QFE. The Air Command Training Member emphasised that it was essential that pilots promptly acquire all aerodrome traffic to ensure suitable separation and sequencing before 'breaking' into the cct but here it seemed the Hawk pilots were not looking out for a departing Jetstream and thus not conscious at the time that they were drawing steadily closer to another ac. Pilot Members reinforced that a meticulous lookout scan is essential along the RW in use and into the cct area - this might have revealed the presence of the turboprop earlier as it climbed steadily from the RW. However, at a closing speed of about 230kt it was fortunate that the crews of both Hawks spotted the Jetstream when they did. That the pair was able to effect avoidance of about 200m at these close quarters was indeed opportune and effectively averted an actual collision. Nevertheless, Members agreed unanimously that the safety of the ac involved had not been assured in the circumstances conscientiously reported here.

## PART C: ASSESSMENT OF CAUSE AND RISK

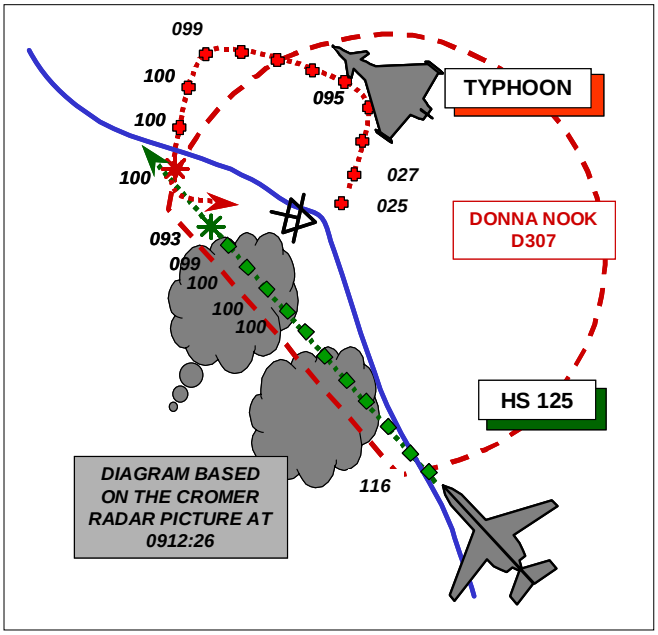
Cause: The Hawk leader did not integrate his formation safely into the visual cct.

Degree of Risk: B.

## AIRPROX REPORT No 024/08

## AIRPROX REPORT NO 024/08

| | | |
|---|---|---|
| *Date/Time:* | 6 Mar 0913 | |
| *Position:* | 5329N 00010E | (Donna Nook Range) |
| *Airspace:* | DF307 | (Class: G) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | HS125 | Typhoon T Mk3 |
| *Operator:* | Civ Pte | HQ AIR (Ops) |
| *Alt/FL:* | FL100 | 8000ft |
| | SPS | (QFE 1019mb) |
| *Weather* | IMC (in and out of cloud) | |
| | | Clear of Cloud |
| *Visibility:* | NR | 5km to SW |
| | | 50km to SE |
| *Reported Separation:* | | |
| | NR | 2000ft V/½nm H |
| *Recorded Separation:* | | |
| | <0.1nm H (see Notes) | |




UKAB Note (1): The TCAS ***simulation*** conducted by NATS on behalf of the UKAB calculates the CPA V to be 13ft and the CPA H to be 75m at 0912.32. For technical reasons the simulation used the Clee Hill radar, which is 120nm from the incident position and is therefore less accurate (at that extreme range) than either the Cromer or the Claxby, which are much closer.

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

**THE HS125 PILOT** reports flying an IFR private flight to Humberside, in and out of cloud, in receipt of a 'radar approach service' from them, squawking 4275 with Mode C. They were heading 310° at 250kt in the descent and had been cleared to FL100 on the approach to Humberside. While level at FL100 they received a TCAS RA warning and in accordance with the TCAS indication they descended. The other traffic remained at FL100 and was not manoeuvring. When emerging from the clouds at about 8500ft another ac was seen passing their right wing less than 0.5nm away in the opposite direction and very fast with a high rate of descent. They did not receive a second TCAS warning, as this ac did not have any transponder indication. He assessed the risk as being very high and reported the incident to Humberside.

**THE TYPHOON T MK3 PILOT** reports flying with an instructor pilot as a singleton on a dry strafe training sortie in Donna Nook Range, in receipt of a range control service from them and squawking 7002 with Mode C. He was the only ac in the range and was conducting low angle ($15^0$ from 2500ft) and high angle ($30^0$ from 10000ft) dry strafe on the strafe panels.

At 0908:22, whilst the $15^0$ dive pattern was being flown, the range transmitted *"Typhoon C/S range transit traffic south to north not below 10000ft"*. Prior to this, no consultation had taken place to ascertain the intended top height of the Typhoon on the range and furthermore, due to the immaturity of Typhoon in the air/ground role, Air Command Air Weapon and Electronic Warfare Range Orders (ACAWEWROs) do not yet contain standard pattern details for the Typhoon. That said, the range information call was acknowledged by the Typhoon Captain but the potential conflict with the range transit traffic was not mentally processed by either Typhoon pilot due to range pattern instruction. After completing a further $15^0$ pattern, the Typhoon was climbed to 10000ft on the range QFE to conduct high angle $30^0$ dry strafe patterns. Upon rolling out on the LOA of 105° at 350kt for the first $30^0$ pass, a civilian business jet was seen ½nm away passing down their right hand side heading towards them but laterally separated and about 2000ft vertically separated. He took no avoiding action as he assessed the risk as being low but slightly later Range Control advised him that an Airprox had been filed.

**THE HUMBERSIDE CONTROLLER** reports that an HS125 was inbound from the SE. To expedite the approach he asked for and received clearance to transit D307 (Donna Nook Range) from S to N at FL100 or above. At the time he saw on his radar that there was a single ac in the range indicating below FL50. The HS125 pilot was told that the Range was active but he was cleared through and levelled at FL100. He was waiting for the HS125 to clear the Range before giving further descent clearance when its pilot reported descending due to a TCAS RA. He then saw that the range traffic was also at FL100, about 2nm N of the HS125 and on a converging heading, so he passed TI on the ac, which passed above [he thought] the HS125, which had descended to about FL85. He then continued the HS125's descent for the ILS approach.

He asked the pilot if he wished to file an Airprox, which he said he did. He said that he would talk to him on the ground and then informed Donna Nook that the range traffic had come close to his ac and the pilot would be filing an Airprox. He was given the details of the Typhoon by the Range Controller.

**THE DONNA NOOK CONTROLLER** reports that he was the Range Primary Controller at RAF Donna Nook and was controlling a single Typhoon ac in the academic pattern for low angle strafe on TGT1, diving from 3000ft. At about 0910 the Master Tower Assistant (MTA) took a call on the landline from Humberside Airport requesting a range crosser at FL100. He approved the crossing and informed the Typhoon pilot that there was a range transit ac from S to N not below FL100. The pilot acknowledged the call and called in dry. A few minutes later the Typhoon pilot called downwind for high angle 30-degree strafe, believing that this would mean a climb to between 6000 and 8000ft. Knowing that the pilot was aware of the range crosser at FL100, he did not place an altitude restriction on the Typhoon. About 20sec later the Typhoon pilot called in dry and was given a *'Continue Dry'* clearance. Between the 'downwind' and the 'in dry' calls, Humberside called back and informed the MTA that his ac had taken avoiding action on the range traffic and was filing an Airprox. The Typhoon pilot then called and asked if there was any other traffic on the range and the controller replied that it was the range transit ac that he had previously informed him of and that the pilot was filing an Airprox. The Typhoon pilot acknowledged and asked that Donna Nook find the details of the ac, which he later got from Humberside. The ac transiting through the range was an HS125 inbound to Humberside airport from Germany.

**ATSI** reports that a HS125 was inbound to Humberside, routeing SUPEL-OTBED on Airway Y70, descending to FL180 and MACC had released the ac at SUPEL. Just before the pilot contacted the Approach frequency, the APR Controller telephoned Donna Nook Range to co-ordinate a crossing clearance of D307 to allow the HS125 a direct route to left base for RW21. On contact with Donna Nook, the APR Controller commented that he was aware that there was an ac in the range but *"can I come through northbound Flight Level One Hundred or above"*. The Range responded, after a short delay, *"That's approved"* and asked for a call when it was clear.

The HS125 established communication with Humberside APR at 0907, reporting approaching FL180 to OTBED and he replied *"you're identified at SUPEL Radar Advisory once leave clear of controlled airspace turn right heading Three One Zero be vectoring for an ILS approach to runway 21*"; the pilot was then instructed to descend to FL100. The base of CAS E of SUPEL is FL175 and FL155 to the W. The radar recording, timed at 0908:06, shows the HS125 approaching SUPEL, descending through FL185, the right turn positioning the ac to track towards the SW corner of D307. Within the range, near the N edge, is an ac [the Typhoon] at FL25, squawking 7002. Approximately one minute later, the HS125 descends through the base of CAS.

The HS125 pilot was instructed to turn right heading 320° at 0909:30 and was advised *"There's a Danger Area to the north of you it is active but you are clear through the range maintaining Flight Level One Hundred or above"*. No further transmissions were made to, or received from, the HS125 until just over two minutes later, when its pilot reported, *"descending due to traffic advisory"*. He was advised about a Typhoon ac just crossing his twelve o'clock and indicating FL100 and the HS125 pilot reported his intention to file an Airprox.

Although it is not unusual for Humberside controllers to request a transit through D307, there is no LoA between the units. The Humberside MATS Part 2 states 'When EGD307 is open APRs are not to issue routing instructions to MACC which would take inbound ac through the Range (eg SUPEL-OTR) without having previously coordinated with the Range'. The APR Controller believed he had co-ordinated a safe level for the HS125 to cross the range; however, he did not use the prefix 'Request Co-ordination' nor receive a readback of the action agreed, as stated in MATS Part 1, Section 1, Chapter 5, Page 10. The Humberside ATC Standards Bulletin 1/2008, published before the Airprox (February 2008), as well as addressing other issues reminded controllers: 'Whenever a controller requires coordination with another agency, the prefix 'Request Coordination' is to be used. This should ensure that you are put straight to a controller rather than passing your request to an assistant who cannot coordinate'.

Additionally, since the Airprox, a further Bulletin has been published (2/2008) which states: 'A recent incident involving a request for clearance through Donna Nook Range highlights the need for coordination to be carried out in accordance with MATS Part 1, Section 1, Chapter 5, para 9. When requesting a clearance through D307 a controller must ascertain whether the range is active/likely to become active whilst his/her traffic is transiting through the range. In the event that it is, the controller must specifically carry out coordination against the range traffic iaw the above reference. Caution must be exercised to ensure that any coordination includes all traffic on the range (formations). The issue of coordination was raised in a previous Standards Bulletin and all controllers are reminded that standard procedures are to be used whenever coordination is carried out with any agency'.

**MIL ACC reports** that Air Traffic Control Range Safety Officers (RSO (ATC)) operating in an RAF Air Weapons Range (AWR) do so iaw ACAWEWROs. ACAWEWROs Section 1 Paragraph 30 d Types of Service states:

"An AWR is a VFR environment (including any holds) and an RSO (ATC) … will only provide the following service:

A non-radar FIS to ac on or departing the AWR.

Lateral or vertical separation for academic against FRA traffic only."

(Academic traffic means ac entering and remaining in the range and FRA (First Run Attack) traffic means conducting a FRA and subsequently either departing or remaining in the range to join the academic pattern).

RSO (ATC)s are not permitted to impose a mandatory level restriction, as they have no instrument aids with which to ensure terrain clearance.

Donna Nook range is a VFR environment and is not equipped with radar. Therefore, a range crossing clearance does not constitute coordination and the RSO (ATC) will not provide procedural separation between range traffic and any other ac.

The Typhoon was operating in Donna Nook Range during the hours of operation conducting high-energy manoeuvres. The approximate height of the tactical circuit was 3000ft QFE 1019. Humberside ATC called the RSO (ATC) requesting a range crossing clearance not below FL100, which was granted. The Typhoon was informed of the crossing traffic and the pilot acknowledged the information. On completing its first attack profile, the Typhoon repositioned for a different type of attack that involved a rapid climb. The Typhoon attack profiles were not available to the RSO (ATC). The RSO (ATC) was subsequently informed that the civil ac crossing the Danger Area had received and responded to a TCAS alert against the Typhoon and would be filing an Airprox.

The Typhoon called Donna Nook at 0858:41 to join the range for tactical tasking. The next 15 transmissions were concerned with the passing of weather information and brief details of the tactical profiles to be flown; these details did not include the heights of the attack runs. At 0907:24 Humberside ATC called Donna Nook to request a range crossing clearance; the Donna Nook MTA answered the line and the Humberside controller said, *"…I know you've got one in but can I come through northbound please? FL100 or above?"* The MTA confirmed the request, liaised with the RSO (ATC) and then gave the clearance thus: *"That's approved, if you can call clear."* Both personnel then signed off the landline. At 0908:16 the RSO (ATC) passed traffic information to the Typhoon *"C/S, range transit traffic south to north, FL100"* and the Typhoon pilot replied *"Typhoon in dry, copied"*. The next 8 transmissions were tactical calls. At 0912:43 Humberside called Donna Nook MTA and said *"Donna, that Typhoon just nearly took out my traffic at FL100."* and the MTA confirmed the ac was a Typhoon. At 0912:58 the Typhoon pilot transmitted to the RSO (ATC) *"Donna from Typhoon C/S we've just had a very close, erm, close miss with an aircraft just on the corner of the range as we tipped in, were you talking to him?"* At this point Humberside told the MTA *"I'll call you back".* At 0913:09, in response to the Typhoon pilot's call, the RSO (ATC) said *"that could have been the crosser at FL100, would that tally?".* The pilot replied *"Affirm, our pattern was at FL100 as well, didn't realise he was going right to (through?) the edge of the range".* At 0913:34 Humberside called Donna Nook MTA to inform them *"…my traffic is going to file an air miss against your Typhoon. he went rocketing up to FL100, and he had to take avoiding action due to traffic information on the TCAS".* In the next 11 transmissions the Typhoon's details were passed to Humberside by the MTA (overlapping the RSO (ATC)'s communication with Typhoon C/S). At 0914:00 the RSO (ATC) called the Typhoon to inform the pilot that the pilot of the crossing ac would be filing an Airprox, which the pilot copied. At 0914:14 the Typhoon pilot asked, *"…confirm he had clearance to go through the range at FL100?".* The RSO (ATC) replied *"Affirm".* At 0916:13 the Typhoon pilot requested the details of the civil ac so that he could try and get in touch with him when they landed. For the remainder of the

transcript the RSO (ATC) obtained the civil ac details from Humberside and passed them to the Typhoon pilot. During the conversation between the controllers, the RSO (ATC) said that when the Typhoon pilot reported he was doing high angled strafe he looked up and saw [the civil ac] just below the cloud and the Typhoon just climbed right up. When the Humberside controller reiterated that the civil ac would be filing an Airprox the RSO (ATC) said *"Yeah, I looked up and they were xxxx close*". The Typhoon pilot copied the civil ac details and then left the range at 0919:29.

It is considered that there were no Mil ATC causal factors in relation to this reported Airprox because the Donna Nook RSO (ATC) acted iaw ACAWEWROs Section 1 para 30 d.

However it is considered that a contributory factor was that the RSO (ATC) allowed the HS125 to transit the Danger Area while it was active with the Typhoon. Further, the lack of Typhoon attack profiles available to the RSO (ATC) may have reduced his awareness of the Typhoon's potential proximity to the range crossing ac.

[UKAB Note (2): (Made before a TCAS Analysis was requested). Although the vertical separation can only be estimated, the minimum horizontal separation can be calculated accurately by projecting the ac tracks. When the ac crossed at 0912:32, between radar sweeps, the tracks were separated laterally by under 0.1nm (the minimum degree of accuracy). At 0912:32 the HS125 was calculated as passing FL086 but the Typhoon Mode C had dropped out due to its high rate of descent (last displayed 4sec previously at 0912:28 showing FL100 before entering the dive). That it had already entered the dive for its dry strafe pass can be verified since its groundspeed had increased to 440kt from about 380kt that it was flying on the base leg of the weaponry pattern. The Mode C does not reappear until 0913:02 when it reads FL016 probably as the Typhoon was recovering from the $30^0$ dive. It can be calculated, therefore, that the average rate of descent was about 15000ft per minute. Using this calculated figure the Typhoon would have been descending at an average of 1500ft per radar (6sec) sweep; therefore as the ac passed the HS125 which was indicating FL086 at 0912.32 (the CPA), it would have been at a calculated level of FL077 (1½ sweeps). It is however recognised that this analysis is based on an average rate of descent and that the vertical separation could have been closer.

It follows therefore that the Typhoon descended through the level of the HS125 while it was descending in response to the TCAS RA. Bearing this in mind a full TCAS analysis was requested from NATS who kindly provided same despite that neither ac was in receipt of a service from one of their units; it was however recognised that the lack of Mode C/S information from the Typhoon could pose a significant limitation].

[UKAB Note (3): For technical reasons the full TCAS investigation used data from the Clee Hill Radar which is significantly further (120nm) from the incident position, and therefore less accurate, than either the Claxby or the Cromer which are significantly closer. Both the Claxby and the Cromer horizontal data agree however, showing the projected tracks overlapping between sweeps].

Due to its complexity the full TCAS Analysis took some time. Extracts from the NATS report are below.

This encounter was not recorded by the ASMT (ACAS Mode S Monitoring Tool) as it occurred out of coverage of the Pease Pottage radar so NODE-L information was used. Unfortunately, in this case the Claxby radar had either no Mode C information or missing information for the Typhoon ac for 7 cycles (rotations) between 0912:28 and 0913:27. However, some Mode S radar data was available (on the HS125) and an investigation/simulation was conducted in conjunction with EUROCONTROL.

The simulation indicated that as the HS125 was in level flight at FL100 it received a TCAS TA at 09:12:05 against the Typhoon that was also in level flight at FL100; the Typhoon was in the HS125's 1 o'clock position at 4.6NM.

At 09:12:08 the first RA downlink from the HS125 indicated that the ac was issued with a "Descend" RA. It should be noted that the simulation suggested that the RA was issued one sec later when the HS125 was still in level flight at FL100.

The simulation indicated that the HS125 started to follow the RA reaching the demanded vertical rate at 0912:17 when the Typhoon was 2.7nm away and 100ft above. At 0912:24 the simulation suggested that the RA on the HS125 weakened to an "Adjust Vertical Speed" RA instructing the pilot that the ac should not climb, which is confirmed by the Mode-S RA downlink. At this time the ac was then descending at ~5000fpm and the radar data shows that the Typhoon had started to descend].

[UKAB Note (4): Mode C tracking of the Typhoon is lost at 0912:28 and after that time vertical distances/rates are calculated/simulated].

The simulation suggested that rather than decreasing the rate of descent, the HS125 continued to increase the rate of descent reaching 6000fpm at 0912:27 when the Typhoon was 1nm ahead and 600ft above it and was descending. The simulation indicated that TCAS detected the descent of the Typhoon and the RA in the HS125 changed to a "Maintain Descent" RA, **however, the aural message and RA downlink would not have changed** as the ac was exceeding the requested rate of descent.

[UKAB Note (5): This change however, would have lasted only a few sec and was not reported by the HS125 pilot].

The simulation suggested that the vertical tracking of the Typhoon was lost a further 1sec later at 0912:28. The loss of vertical tracking by TCAS was confirmed by the RA downlink messages where the altitude change stopped at FL98.

The simulation indicated that the Typhoon increased its rate of descent to more than 20000fpm passing the HS125 with a CPA of 0.04NM and 13ft before "Clear of Conflict".

[UKAB Note (6): **TCAS will not issue RAs against intruders with vertical rates in excess of 10000fpm.** On page 27 of 'Introduction to TCAS II Version 7' – FAA it states in the 'Threat Detection' section, that TCAS will inhibit threat declaration against intruders with vertical rates of climb/descent in excess of 10000fpm].

[UKAB Note (7): The quoted accuracy of the Clee Hill Radar at 'mid ranges' is 57yards in both range and azimuth (source NATS); consequently at maximum range the accuracy is less. The quoted accuracy of Mode C is ±200ft. The CPA distances calculated in the simulation should be seen in the context this information].

The report concluded that TCAS worked as designed and the HS125 pilot followed the TCAS RA initially, however the ac continued to descend, exceeding the required response.

**THE TYPHOON UNIT** comments (before the TCAS analysis was available) that this Airprox highlights some interesting issues. The immaturity of Typhoon in the Air-to-Surface role means that there are no standard Typhoon range patterns in ACAWEWROs. This may cause confusion for the Range Controllers as to the pattern heights required for each profile; however, if controllers are unsure they should be proactive and ask the pilot what the pattern top-heights will be. In this instance, if the Typhoon crew had been consulted prior to a range transit being sanctioned, the SA of the Typhoon pilots would have been increased and the potential to disregard the information reduced. It is worrying that Donna Nook routinely allows civilian ac to transit an active range when high performance ac are using the airspace. Notwithstanding the breakdown of effective communication, TCAS is extremely sensitive to closure rates. The standard recovery for Typhoon off-target is 5g. If civilian ac are going to transit active military danger areas where high-performance manoeuvres are being conducted, they must be aware of the potential for TCAS warnings to be generated

**HQ AIR (OPS)** comments that this was undoubtedly a very close call, although perhaps marginally less close than the TCAS simulation indicates. The procedures around a Range Danger Area led all parties involved towards this event. The Typhoon range patterns were being developed resulting in the Range Controller not knowing the significance of the High Angle Strafe profile. Unfortunately, he was not inquisitive enough to ask the Typhoon crew where they were going. The Typhoon crew ***were*** given TI on the HS125 but they did not appreciate its significance and they did not expect it to be within the range boundary. Finally, as with all 'MATZ Crosser' scenarios, the only given was the height, not the time or track.

## 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 agreed that this had been a most serious occurrence where all the available safety nets, including correctly functioning TCAS in the HS125, had not prevented the ac coming very close indeed while flying in weather conditions that precluded any possibility of visual acquisition in time to take any effective avoidance.

One Member queried the accuracy of the simulation/radar analysis, as the pilots seemed to agree that the horizontal miss-distance was about ½nm and the analysis showed it to be significantly less. The Secretariat explained that it was their view (agreed by HQ Air) that the respective sightings had been after the CPA (H) but at or about the CPA (V), which in the circumstances would have been 0 as the ac passed through each other's level at about 8500ft. Nonetheless, due to the apparent disagreement between the horizontal separation reported and that calculated from the radar recording/TCAS simulation, a further analysis of the radar data from 4 different radar heads was conducted. It concluded that all 4 radars showed the respective ac tracks (unfortunately between sweeps on all 4 recordings; therefore tracks were projected) merging at about 0912.30. A vertical analysis was more difficult and from 3 radar heads inconclusive. The 4th however, gave an estimated vertical miss-distance of 400ft at the point of min H (0912.30), the Typhoon still above the HS125 but descending rapidly and on slightly divergent tracks (105° - the LOA for the target / 320° - radar heading) while the ac passed starboard to starboard. This calculation was based on a rate of descent of 10000ft just after the Typhoon entered the dive and when the TCAS ceased to provide accurate information. It was however concluded that with the available information the vertical miss-distance was, and could only be, a best estimate.

The DAP Advisor briefed the Board regarding the differences between the two types of service available to ac wishing to transit a Danger Area, namely a Danger Area Crossing Service and a Danger Area Activity Information Service, the latter being the only type of service published in the UKAIP (D307) as being available at Donna Nook. Notwithstanding the complexities and ambiguity of current regulations, he noted that the RSO (ATC) was a fully qualified Controller and, in his opinion, should have been empowered to allow the HS125 to cross the AWR at a level that deconflicted it from range traffic if that were possible and with the agreement of the range user. Notwithstanding the current procedures, the RSO clearly thought that he had the authority to clear an ac to transit the Danger Area as did the majority of experts consulted by the DAP Advisor (an ex ATC Examiner) who thought that qualified ATCOs could and should make sensible decisions in pursuance of their task and ac safety. Having noted the seriousness of the incident, he had contacted HQ Air Staff and asked that they clarify both the procedures and the range regulations. [UKAB Note 8: Copy of letter provided post Meeting]. He also stated that, through the Danger Area Users Group (DAUG) (HQ Air and CAA are members), he had initiated independent and immediate action to try to ensure that such an incident cannot re-occur. There was discussion as to whether or not transits of an active AWR should be permitted at all however, if they were not permitted, one Member suggested that transit ac would circumnavigate AWRs very close to the boundary which, in many circumstances, could be even less safe. The DAP Advisor also said that in his opinion, contrary the Mil ACC report, level restrictions to range ac can be applied and that terrain clearance is not a factor since the (military) ac operate under VFR. He also agreed to review the AIP entries for all AWRs. [UKAB Note 9: The subject review is already in progress].

Controller Members discussed the clearance given to transit the Range and, although Humberside APR had no reason to believe that it was not a valid clearance, the landline transcript showed that he had not used the terminology 'request clearance'. This would have ensured that he talked to the Controller (RSO (ATC)) rather than the Assistant who had not read back the co-ordination agreed as required by MATS Part 1. It was also observed that the RSO (ATC) had not consulted the Typhoon pilots before clearing the HS125 through the range. A military pilot Member said that, had he done so, it would have almost certainly placed that piece of information much higher in their 'list of priorities' and they would probably not have inadvertently disregarded it. The DAP Advisor informed Members that almost all those expert members attending the recent DAUG meeting considered that this was a prerequisite before authorising a transit of a Range.

There was considerable discussion regarding the TCAS implications of this incident. The HS125 pilot had initially reacted correctly to the RA that he received and had no means of knowing that the Typhoon was almost simultaneously about to enter a very steep descent or that, due to its (eventual) rate of descent his TCAS was not effective against it. Although there had been recent legislation regarding maximum rates of climb/descent in the UK, this applied only in Controlled Airspace and not in Class G or Danger Areas nor in the immediate vicinity of AWRs where ac frequently conduct very high energy manoeuvres to achieve the parameters required to release weapons, to avoid weapon fragments and ricochets and to maintain safe terrain/sea clearance. Such manoeuvres are, as witnessed by this incident, not always within the operating parameters of TCAS so it may not provide collision warning. Pilot Members opined that many pilots were not aware of this. The high-energy manoeuvres

and high closing speed (1nm every 5 sec) meant that the HS125 pilot had very limited time to react to the rapidly changing TCAS information (30sec from TA to clear of conflict with 3 changes between).

It was also noted by one Member that the weaponry pattern being flown by the Typhoon was outside the surface boundary of D307. Members were informed that this is the case at several AWRs where the surface Danger Area is too small to contain the patterns. The prime purpose of the (air and ground) Danger Areas associated with AWRs is to provide safe separation from the weapons being released rather than the ac dropping them, which may fly patterns well outside the Danger Areas.

Although accepting that when new ac come into service established procedures may have to be amended, military pilot Members considered it would have been good practise to call the RSO before getting airborne or brief him on the range joining call to make him aware of any aspect of their intended weaponry that were in any way unusual or not (fully) compliant with Range Orders. One pilot went further and opined that since Range Orders did not expressly permit their pattern, the Typhoon crew had not complied fully with the orders, which are mandatory.

When considering all the information however, Members noted that the Typhoon crew, although not being asked to agree the HS125's transit, had been warned of it and had acknowledged the TI. They had not, however - perhaps because they were preoccupied with an unfamiliar weaponry pattern - registered it as being a confliction; indeed they were surprised when they were told about the HS125 immediately after the Airprox. In the light of the information given by the DAP Advisor, Members were surprised that the RSO had not asked the Typhoon pilots if they were content for the HS125 to transit at FL100; had they been asked and, in the knowledge of the height of their next pass, specialists thought that they would not have agreed any such request. None of the personnel, agencies, procedures or equipment in place had in any way prevented or ameliorated the risk involved in this incident: therefore, Members agreed unanimously that there had been an actual risk that the ac would have collided.

The Board noted the immediate follow-up action taken by DAP and thanked NATS and EUROCONTROL for their most comprehensive TCAS analysis.

The DAP Advisor was asked by the Chairman to brief the Board on an ongoing basis as the review work proceeded.

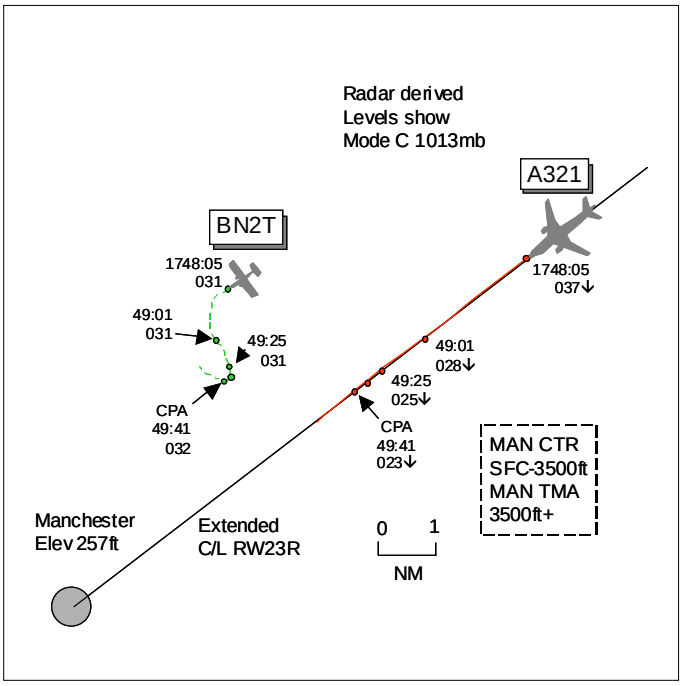
## PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Typhoon pilots did not appreciate the significance of the TI given following the inappropriate crossing clearance issued by the RSO.

Degree of Risk: A.

## AIRPROX REPORT NO 025/08

| | | |
|---|---|---|
| *Date/Time:* | 7 Mar 1750 | |
| *Position:* | 5325N 00208W (6nm FIN APP RW23 Manchester - elev 257ft) | |
| *Airspace:* | Manchester CTR | (Class: D) |
| *Reporter:* | Manchester DIR | |
| | *1st Ac* | *2nd Ac* |
| *Type:* | BN2T | A321 |
| *Operator:* | Civ Comm | CAT |
| *Alt/FL:* | 3000ft (QNH) | 2000ft↓ (QNH) |
| *Weather* | VMC CLBC | VMC CAVK |
| *Visibility:* | 10km | NR |
| *Reported Separation:* | NR | 500-1000ft V/ 1-2nm H |
| *Recorded Separation:* | 600ft V/2·8nm H OR 900ft V/2·3nm H | |




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

**THE MANCHESTER DIR** reports that the BN2T was operating Category B at 3000ft VFR close to the ILS C/L and was transferred to him from APC S. He saw the flight was closing the C/L so he asked the pilot if in 1nm he would turn which he declined stating that he was Category B and higher category than other traffic. As the flight was closing quickly on ILS traffic he gave an avoiding action turn which the pilot took. Subsequent traffic was broken off the ILS and returned to the hold. Although the BN2T was VFR he considered the risk of separation loss with ILS traffic not on his frequency was high. Tower was informed and departing traffic was stopped.

UKAB Note (1): Met Office archive data shows the Manchester METAR as EGCC 071750Z 24014KT CAVOK 07/ 02 Q1007 NOSIG=

**THE BN2T PILOT** reports operating a local flight from Manchester VFR Category B and in receipt of a RCS from Manchester on 118·575MHz squawking a discrete code with Mode C. The visibility was 10km in VMC flying 1500ft below cloud and the ac was coloured grey/white; no lighting was mentioned. The pilot's initial request to operate at 4000ft QNH to minimise disruption to ATC was refused and they were assigned an operational height of 3000ft QNH. The flight was carried out VFR and they remained visual with ac on the approach in addition to monitoring the ac's TCAS. Whilst in flight and prior to the Airprox, he alerted the Air Traffic Controller that he was on a Category B flight and that his task looked to be moving S'bound toward the C/L of RW23. He emphasised that he needed to stay with this task in order to be afforded Category B priority. It should be pointed out from the outset that at no point during the flight was any instruction given by ATC not carried out accordingly. Any reluctance on his part, as the wording on the report implies, merely echoes his commitment to stay with his assigned tasking. Whilst progressively moving southward at 80kt, when about 2nm N of the C/L and despite alerting the Air Traffic Controller prior to the Airprox that they needed to stay with their task, he was given a collision avoidance action which was to turn R. He endeavoured to point out to the Air Traffic Controller that a Category B Flight has priority over Category C (or lower) flights but the response was *"we can't have you flying into other aircraft"*. No TCAS alerts or warnings were received during the encounter and he did not assess the risk.

Following an exchange of dialogue between his Unit Operations and ATC via land line, he was asked to request the use of 4000ft QNH to assist in passing traffic on the approach path, below him. This was granted and then he requested 4500ft to assist ATC further. However, he was a little mystified as to the chain of events that took place by landline considering he had requested 4000ft initially. He opined that on some occasions, Air Traffic Controllers

do not always afford Category B flights the priority that is officially recognised. Some controllers appear, albeit with good intentions, to have a misconception that a Category B flight should be controlled to 'fit in' around other traffic when in fact, other traffic should be controlled to 'fit in' in accordance with the Priority assigned.

**THE A321 PILOT** reports inbound to Manchester IFR and in receipt of a RCS from Manchester Radar then Tower squawking with Modes C and S. Fully established on the ILS heading 234° descending through 2000ft, he thought, they were notified of the BN2T which was easily acquired both on TCAS and visually by its lights. The BN2T was in their 1-2 o'clock range 2-3nm before eventually passing down their RHS about 500-1000ft above and 1-1·5nm clear. It was not at all close and did not cause any problems in the handling or management of the approach. No TA or RA warnings were received; no avoiding action was given, taken nor required and a risk of collision did not exist at any point.

**ATSI** reports that the controller, who had been operating as the Manchester FIN DIR for approximately 30min, stated that his workload had increased from light, at the time he took over the position, to moderate when the Airprox occurred. The incident occurred in Class D airspace of the Manchester CTR (SFC-3500ft).

The A321 flight established communication with Manchester Approach S (not the controller's frequency) at 1738, reporting approaching FL70 direct to MIRSI. Subsequently, it was vectored towards the ILS RW23R. At 1743, after avoiding weather build-ups, the A321, now heading 090° and descending to 5000ft, was transferred to the FIN DIR for final positioning. Also on the Approach S frequency at the time was the BN2T flight. This ac was carrying out a Category B task, in the Manchester vicinity i.e. N of the airport, at 3000ft. At 1744, due to traffic workload and the possibility that the ac might route closer to the approach path, the flight was transferred to the FIN DIR.

Shortly after the A321 flight made its initial call on the FIN DIR's frequency, it was instructed to descend to 4000ft. Immediately afterwards, the BN2T's pilot contacted the FIN DIR and confirmed with the controller that he was operating VFR. The controller commented that, earlier, when he had been operating as the APR S, the BN2T had departed from Manchester with the intention of operating IFR at the Minimum Stack Level (FL70). However, due to the cloud conditions at the time, the flight details were changed to operate at a lower altitude and 3000ft was agreed. At the time, it was mentioned that the ac might, subsequently, have to operate close to the approach path. The A321 was, subsequently, turned onto base leg and then onto heading 210° to intercept the LLZ for RW23R. At a range of 14nm it was instructed to descend to 3000ft. At 1747:20, now at 11nm, the A321 crew reported established on the LLZ and were cleared to descend on the ILS. Thirty seconds later the flight was instructed to maintain not less than 160kt until 4 DME and afterwards was transferred to the Tower frequency. The radar, timed at 1748:05, shows the BN2T, turning through a SW'ly heading, 6·3nm NNE of the airport and 3nm from the C/L of the approach path.

At 1749, approximately 1min after the A321 flight had been transferred to the Tower frequency, the FIN DIR transmitted to the BN2T flight *"I need you to turn north in about a mile please"*. Although some of the pilot's response was unintelligible, he did report *"we can't deviate I'm afraid"*. The radar, timed at 1749:01, shows the A321 descending on the ILS passing FL28 (2620ft QNH 1007mb), 3·8nm E of the BN2T. The latter is maintaining FL31 (2920ft QNH) tracking SE, 2·2nm from the ILS C/L. The following transmissions were then made to and from the BN2T flight:

ATC*"Okay then essential traffic information twelve in fact left er three miles two thousand five hundred feet avoiding action turn right heading two seven zero degrees"*.

BN2T*"Right two seven zero degrees BN2T c/s"*.

ATC*"BN2T c/s if you continue that right turn you can then resume your own navigation please is it now Category Alpha"*.

BN2T*"We are Bravo er which is above Charlie Delta as you know but er we can go Alpha if we need to go we need to keep on this job"*.

ATC*"Yeah you realise we're just about to close the airfield if that's what you need then that's what we will have to do"*.

BN2T*"That is understood we're try-I'm trying to stay as far north as I possibly can"*.

ATC*"Yeah and the problem also is obviously there is traffic and we have to avoid you hitting that other traffic but let me know are you gonna continue your right turn now*".

BN2T*"Affirm BN2T c/s"*.

The BN2T flight started its avoiding action R turn when it was 1·9nm from the RW23R approach path. The CPA between the subject ac at 1749:41 was 2·3nm, by which time the BN2T was in its R turn, 900ft above the A321.

Following these transmissions, the FIN DIR turned his attention to two inbound ac that needed to be repositioned away from final approach because of the presence of the Category B flight. No further contact was made with the BN2T flight for a further 8mins by which time the FIN DIR had handed over the position.

The radar over a period of 17mins prior to the Airprox shows the BN2T operating 6-7nm NNE of the airport, generally about 4-5nm from the approach C/L. On one occasion it did close to about 2·7nm. It was only after the A321 had been transferred to the Tower frequency that the BN2T tracked closer to the C/L.

The MATS Part 1, Section 1, Chapter 4, Pages 5/6, states the procedures for flight priorities. *'Normally requests for clearances shall be dealt with in order in which they are received and issued according to the traffic situation. However, certain flights are given priority over others.'* The MATS Part 1 shows a table of the categorisations, confirming Category B flights have priority over 'normal flights'. The Manchester MATS Part 2 states the local procedures for the BN2T operations. Of note: *'Officially, all flights by the Defender (BN2T) under the Special Flight Notification should be CAT B unless CAT A is required; When flying under an ATC clearance, the pilot shall not change altitude, operating area or route without further ATC clearance; It is important that ATC does not question the purpose of, or discuss details of, the flight over the R/T; Depending on the RW in use at Manchester, different height bands apply as follows: Runway 23L/R. The aircraft will operate either up to 3000ft ALT MAN QNH or at Minimum Stack Level. These height bands are to be strictly adhered to during the times 0730-2200 local daily. When the aircraft is operating up to 2000/3000ft ALT, it will be controlled by Manchester Approach Radar.'*

Concerning this occasion, the FIN DIR commented that he was fully aware that the BN2T was operating on a Category B flight and how this would affect the priorities with other traffic. He added that in the period he had been operating as the FIN DIR, the BN2T had remained generally in an area far enough from the C/L of RW23R to allow normal arrival operations. As the ac was operating VFR it was not necessary to provide standard separation from IFR flights. (Class D procedures, as stated in the next paragraph). It was only because the flight then started to route towards the approach path that he considered that further action was necessary. The FIN DIR stated that, although realising that the BN2T's pilot may not either be able, or wish, to update his flight details on the frequency, if he had been allowed more notice of his intentions he would have been able to route the A321 away from the ac's vicinity. In the event, he said he had only a short time to resolve the potential confliction with the A321 and he decided to issue avoiding action to the BN2T. Following that action, further arriving flights were not cleared to make an approach whilst the BN2T operated in the area at 3000ft. Subsequently, although the procedures state that such flights should not operate between 3000ft and the MSL, the ATC Airport Watch Manager agreed that the BN2T could operate at 4000ft. This meant that some of the airport procedures, involving Missed Approaches and certain departure routeings, had to be modified. NB An ac operating at 4000ft is within Class A airspace of the Manchester TMA and requires separation from IFR flights.

The MATS Part 1, Section 1, Chapter 2, Page 1, states the minimum services to be provided in Class D airspace: *'(a) Separate IFR flights from other IFR flights; (b) Pass traffic information to IFR flights on VFR flights and give traffic avoidance advice if requested; (c) Pass traffic information to VFR flights on IFR flights and other VFR flights'*. On this occasion, the FIN DIR only passed TI to the BN2T flight and then only as he was about to issue an avoiding action turn. The A321 flight was not informed about the BN2T, although the pilot stated in his written report that he was aware of its presence.

It is understood that the local ATC Management, together with the BN2T Operator, are reviewing the current operational procedures and will revise them as necessary.

## AIRPROX REPORT No 025/08

### PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members sympathised with the FIN DIR's predicament. Prior to the Airprox the BN2T had been sufficiently clear of the FAT to enable normal operations to continue. Initially, the FIN DIR had not fulfilled his responsibilities regarding service provision in Class D airspace in that prior to the Airprox no TI was given to either crew so when the BN2T's pilot had routed towards the FAT after the A321 flight had been transferred to Tower, FIN DIR's only immediate option was to give an 'avoiding action' turn away from the approaching A321. He could then fulfil his responsibilities regarding flight priorities and service provision in Class D airspace but only after this potential confliction had been resolved. The FIN DIR did not have to separate the subject ac but he was not able to pass timely TI to both crews or give traffic avoidance to the A321 flight if the crew requested it in the very short period of time available to him. One ATCO Member believed that the FIN DIR should have been prepared for the BN2T to manoeuvre, as it did, and therefore retained control of the A321 flight on his frequency until it was clear of the BN2T, allowing him to immediately discharge his Class D airspace responsibilities. Members agreed that the ideal way to resolve situations like these tactically was in the vertical plane thereby allowing Cat B flights to carry out their tasks with little or no interruptions whilst allowing normal air traffic to continue; this was accomplished in this case after the Airprox. It was thought by some Members that the Manchester MATS Part 2 procedures for the BN2T operations appeared to be overly restrictive, effectively placing undue constraints on the aircrew (not changing altitude, operating area or route) when 'free reign' was what Cat B flight should be afforded, wherever possible. Also, the operating levels specified (up to 3000ft or at MSL) did not allow the controller any flexibility to offer intermediate levels to deconflict the BN2T vertically. These facts answered the BN2T pilot's query of why 4000ft was initially not available, only being offered later by the Watch Manager to alleviate the traffic disruption owing to the airport closure. Members welcomed the initiative taken by Manchester and the BN2T operator to review the operational procedures. However, at the end of the day, both crews were flying in accordance with their ATC clearances with the BN2T's unexpected turn leading to a conflict close to the RW23 FAT. The avoiding action given to the BN2T flight and actioned by its pilot had resolved the potential confliction which led the Board to agree that any risk of collision had been quickly and effectively removed.

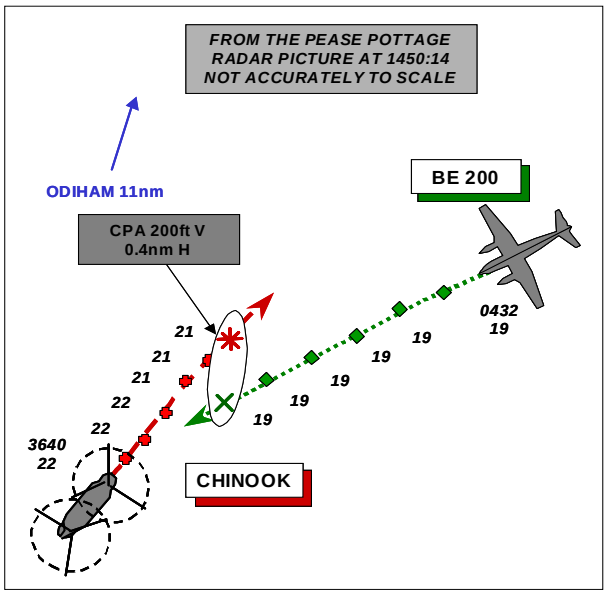
### PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in Class D airspace in the vicinity of the Manchester RW23 FAT.

Degree of Risk: C.

# AIRPROX REPORT NO 026/08

| | | |
|---|---|---|
| *Date/Time:* | 7 Mar 1450 | |
| *Position:* | 5106N 00058W | (6nm S Lasham) |
| *Airspace:* | London FIR | (Class: G) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | Chinook HC Mk2 | Beech 200 |
| *Operator:* | JHC | Civ Comm |
| *Alt/FL:* | 2000ft | 2000ft |
| | (QNH 1012mb) | (RPS 986mb) |
| *Weather* | VMC NR | VMC NR |
| *Visibility:* | >20km | 10km |
| *Reported Separation:* | | |
| | 0ft V/200m H | 500ft V/1000m H |
| *Recorded Separation:* | | |
| | 200ft V/0.4nm H | |




## PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

**THE CHINOOK HC MK2 PILOT** reports that as they climbed out from low level, heading 010° at 120kt, Odiham APP passed them details of possible conflicting traffic to their right. An ac was identified in the right sector and they informed APP that they were visual with the traffic. After levelling off at 2000ft QNH, the RHS co-pilot suddenly spotted an ac 200m away in their 1 o'clock at the same altitude, on a reciprocal track; the ac passed down their right-hand side. Following discussion on the ground with the ATC Supervisor, it appears that the ac which they saw and called visual with was one that was further away than the traffic reported by Approach. Having identified the further of the two ac, they believed there to be minimal risk of collision, and hence relaxed their lookout in that direction. This allowed them to miss the conflicting traffic until it was already passing abeam.

He assessed the risk as being Medium.

**THE BEECH KING AIR 200 PILOT** reports flying a VFR flight from Biggin Hill to Bournemouth with 2 pilots and all lights switched on. At the time of the incident they were heading 230° at 180kt squawking as directed with Mode C and in receipt of a RAS [he thought, actually a RIS] from Farnborough LARS. ATC informed him of a contact in their 12 o'clock at a distance of 5nm and on looking a Chinook was seen immediately by both himself and the observer, he called visual and watched the Chinook which appeared to be recovering to RAF Odiham. The Chinook was passing slowly from left to right of him and so he initiated a gentle left turn through about 5° which resulted in an avoidance of the traffic that he presumed was working another frequency. In his opinion the risk was negligible and he noticed that the Chinook appeared to do nothing to avoid them.

**MIL ACC** reports that a Chinook was returning to RAF Odiham after a pre-planned sortie to give troops awareness of how helicopters enter and exit remote bases in operational locations. The Chinook was in a level cruise at 2000ft on the QNH of 1012mb, heading 010° at 120kt at the time of the reported AIRPROX. The Beech King Air 200 was on a commercial VFR flight from Biggin Hill airfield to Bournemouth airport and was level in the cruise at 2000ft on the RPS of 986mb and was heading 230° at 180kt.

The Chinook was receiving a FIS from Odiham APP on UHF and the Beech was receiving a RAS from Farnborough Radar (RADAR) on VHF. At 1448:56, the Chinook pilot informed APP that they are *'re-joining Southgate 2000ft'*, APP responded promptly, passing the Odiham QFE and QNH, which the pilot read back correctly. At 1449:18, APP gave the pilot TI saying, *'traffic north east 3 miles southwest bound indicating 2000ft Farnborough QNH* and the pilot called visual 6sec later then informing APP that they were *'approaching MATZ boundary Stud 2* [Odiham Tower]', which APP acknowledged. The Chinook pilot then reported that *'it appears that the ac which we saw* (and called visual on) *was further away than the traffic reported by APP'*. The radar confirms

that the Beech was 4.1nm [at 1449:19] away and not 3nm away, as stated by APP however, it is considered that the discrepancy in the TI was not a factor contributing to the incident.

[UKAB Note (1): There was a contact at 3900ft at a distance of about 7nm in the Chinook's 12 o'clock but that was a Citation XL ac tracking southbound before turning to the east inbound Gatwick.]

At 1449:56, the Chinook pilot requested join from Odiham TWR via Southgate and 9sec later TWR gave permission to join and informed the Chinook that there was *'one in, north side, surface wind 260 15'*, which the pilot acknowledged.

Analysis of the PP radar (set to QNH 1011) shows that the CPA at 1450:07 was 0.4nm. Analysis of the incident with the PP radar set to 15nm, with full SSR labels showing, records the Chinook at 2100ft and the Beech at 1900ft at that time. The Beech pilot reported becoming visual with the Chinook 5nm miles away and maintaining visual contact throughout and he also reported initiating a gentle left turn through about 5° to avoid the Chinook.

It is considered that there were no Mil ATC causal factors relating to this Airprox because the Chinook was receiving a FIS. APP elected to give TI on the Beech, showing awareness of the type of sortie the Chinook was flying and in the interests of flight safety. The Chinook crew acknowledged the TI and they called '*visual*'

**ATSI** reports that the King Air pilot established communication with Farnborough LARS W at 1437:30. The pilot reported routeing from Biggin Hill to Bournemouth at 2000ft, via Ockham and Southampton and requesting a RIS. The aircraft was identified 5nm W of Biggin Hill and was placed on a RIS. TI was passed straight away (not about the Chinook) and subsequently, at just before 1446, the controller issued TI *"there is pop up contact twelve o'clock range of four miles no height type or history available probably spurious"* and the pilot reported looking. The radar recording (from the same Heathrow 23cm source used by the controller) timed at 1446:38, shows primary traffic tracking N in the King Air's 11 o'clock at 4.4nm. No further RT contact was made with the King Air pilot before he was cleared to leave the frequency for Solent Radar at 1450. Although the pilot did not report visual with the traffic on the frequency, he confirmed in his written report he was visual with the Chinook at a range of 5nm.

**JHC** did not comment.

## PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board noted that this incident had taken place in Class G airspace to the S of Odiham where both ac were operating legitimately and the prime means of collision avoidance was 'see and avoid'. In this congested area both pilots had sensibly opted to ask for an ATC service to assist with this responsibility and both ATC units had notified the respective pilots of the opposing ac in good time. Following the TI from Farnborough LARS, the King Air pilot visually acquired the Chinook about 5nm away and decided that only a small turn was required to avoid it, notwithstanding that he had right of way under the Rules of the Air Rule 9 (3).

The 'see and avoid' principle depends however on the pilot visually acquiring the opposing traffic and the Board noted that the Chinook pilot(s) had identified the wrong ac following slightly inaccurate TI from Odiham APP, deciding that it was not a risk. The ac they saw (probably) was well separated vertically; they had not seen the conflicting King Air, head on to them, until it was very close (200m he estimated), too late to take any meaningful avoidance in such a large and relatively unmanoeuvrable (at least horizontally) ac. One Member suggested that the King Air pilot had flown too close to the Chinook but the majority view was that bearing in mind the geometry of the occurrence, the onus was on the Chinook pilot to take the avoidance. A helicopter Member suggested that if the ac had been very close the Chinook could have descended from 2000ft in a fully controlled manner and remaining well clear of the surface, almost instantaneously. In any case the radar recording showed the separation to be 0.4nm which was rather greater than that estimated by the Chinook pilots.

Since the King Air pilot had taken visual avoidance on the Chinook, Members agreed that there had been no risk of collision.

**PART C: ASSESSMENT OF CAUSE AND RISK**

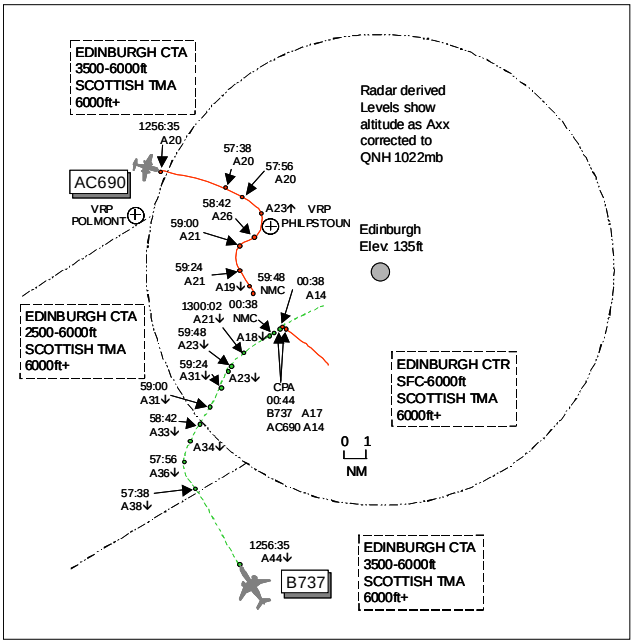
Cause: Late sighting by the Chinook pilots.

Degree of Risk: C.

## AIRPROX REPORT No 028/08

## AIRPROX REPORT NO 028/08

| | | |
|---|---|---|
| *Date/Time:* | 17 Mar 1301 | |
| *Position:* | 5555N 00330W (5nm FIN APP RW06 Edinburgh - elev 135ft) | |
| *Airspace:* | Edinburgh CTR | (Class: D) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | B737-700 | AC690 |
| *Operator:* | CAT | Civ Comm |
| *Alt/FL:* | 2100ft↓ (QNH) | 1800ft (QNH) |
| *Weather* | VMC CLOC | VMC CLOC |
| *Visibility:* | 40km | 10km |
| *Reported Separation:* | 300ft V | NR |
| *Recorded Separation:* | 300ft V/ 0·2nm H | |




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

**THE B737 PILOT** reports inbound to Edinburgh IFR and in receipt of an ATS from Edinburgh Tower on 118·7MHz squawking with Modes C and S. Previously, whilst being radar vectored for an ILS on RW06, they became aware of an ac (the subject AC690) joining the cct VFR from the N. Just prior to intercepting the ILS GP when established on the LLZ, the other ac was displayed on TCAS about 4nm away to their port and in front of their ac, heading in the opposite direction. They asked Approach for the intentions of the other ac and were told it would shortly be turned N, away from the final approach. Heading 063° at 160kt and 2100ft QNH whilst intercepting the GP, they saw the AC690 to the L of their ac and about 0·5nm in front which led to a TCAS TA. The AC690 was now heading towards them, slightly below their altitude, and they heard the Tower controller instruct the AC690 pilot to 'go-around'. They then received an RA 'monitor v/s', he thought, which was followed by reducing the ac's v/s, the AC690 passing directly below by 300ft, and they were able to resume the ILS when clear of conflict. The Captain opined that had the AC690 pilot complied with the ATC instruction, he believed that the ac would have collided. He assessed the risk as high.

UKAB Note (1): The Captain was contacted after the Secretariat received his completed CA1094 to discuss the TCAS warnings received and actions taken. On reflection, the Captain agreed that owing to the corrective action required, the TCAS command annunciated would have been 'adjust v/s' not 'monitor v/s' as stated in his report.

**THE AC690 PILOT** reports inbound to Edinburgh VFR and in receipt of an ATS from Edinburgh Tower on 118·7MHz squawking with Mode C. He was cleared by ATC for a LH downwind join for RW06 and whilst downwind at 1800ft and 120kt he was told to report turning base. Before turning base he was told to report finals and as he was about to turn he heard another pilot report established on the GP and warn ATC about how close his ac was below theirs. ATC told him to 'go-around', which, at that point, would have put both ac closer, as his ac was lower and slower. He requested to reposition onto R base in order to clear the airliner's flightpath in a faster and safer manner, which ATC cleared him to do, and as soon as he cleared the other ac's flight path, the airliner's pilot reported resuming descent on the GP.

**THE EDINBURGH ADC CONTROLLER** reports mentoring a trainee when the AC690 flight was positioned downwind LH for RW06 and was asked to report ready for base leg. As the AC690 approached this point the pilot was instructed to report final. The ATM was out of service and she had judged visually that the AC690 would join final approach at between 2 and 3 miles from touchdown. At this point the B737 was believed to be at 10nm from touchdown on RW06 FAT. About 1min later the Radar Controller phoned to say the B737 was 6nm from touchdown by which time the AC690 was about to turn final. This led to the decision to break-off the AC690's

approach, the safest option being to instruct the pilot to continue across the FAT and hold to the S. The crew of the B737 then called to say he was at 4·9nm and had received a TCAS RA on an ac passing in front of him. She asked the B737 crew what level they would be climbing to and was told to 'standby' before the crew elected to continue the ILS approach. The AC690 flight was instructed to join final approach after the B737 had landed and did so at 3nm.

**THE EDINBURGH RADAR 1 CONTROLLER** reports that Tower was working without the aid of the ATM, which was out of service, and as such he was providing 10nm range checks on inbound traffic. He informed Tower of the inbound AC690 VFR via Polmont VRP (10·5nm WNW Edinburgh) followed by a 10nm check on the B737. The AC690 was seen to join downwind LH RW06 by turning R downwind. Whilst establishing on the ILS the B737 flight was given traffic on the AC690 which then turned onto base leg. He called Tower to ask what their plan was with the AC690 and that the B737 was now at 6nm. He told the B737 crew that he believed that the AC690 would be remaining clear to the N and then transferred the flight to Tower: however the AC690 continued S'bound through the final approach below the B737. Tower told him that the B737 flight had reacted to a TCAS alert but was continuing to land.

UKAB Note (2): Met Office archive data shows the Edinburgh METAR as EGPH 171250Z 36007KT 320V040 9999 BKN040 06/M03 Q1022=

UKAB Note (3): The UK AIP at AD 2-EGPH-1-11 Section 2.21 Noise Abatement Procedures Para b states *"For visual approaches to Runway 06/24 the following limitations will apply: 1. Propeller driven ac whose MTWA does not exceed 5700kg will not join the final approach to either runway below 1000ft aal. 2. .....Aircraft approaching Runway 06 are to join the extended centre-line at a height of not less than 1500ft."* Page AD 2 EGPH-1-14 Section 2.22 Flight Procedures Para 8 VFR Flights states *"a) VFR flights in the Control Zone will be given routeing instructions and/or altitude restrictions in order to integrate VFR flights with other traffic. b) Pilots should anticipate routeing instructions via the Visual Reference Points detailed in paragraph 10 or the routes detailed in paragraph 11." c) Pilots of VFR flights are reminded of the requirement to remain in VMC at all times and to comply with the relevant parts of the Low Flying Rules, and must advise ATC if at any time they are unable to comply with the instructions issued."* Page AD 2-1-15 Para 11 Entry/Exit Lanes states *"a) To permit ac to operate to and from Edinburgh in IMC but not under IFR the following entry/exit lanes have been established for use, under the conditions stated, as follows: - i) 1. a lane 3nm wide, known as the Polmont lane, with centre-line the M9 motorway extending from Grangemouth (near the western boundary of the Edinburgh Control Zone) eastwards, via the Polmont Roundabout, Linlithgow Loch and Philpstoun to a point at which it joins the Edinburgh Aerodrome Traffic Zone. iii) ac using the lanes must remain clear of cloud and in sight of the ground or water, not above 2000ft (Edinburgh QNH), and in flight visibility of not less than 3km. b) Additionally, to permit the effective integration of traffic, flights operating in VMC and under VFR may be required by ATC to follow these routes as detailed in paragraph 8."*

**ATSI** reports that the ADC position was being operated by a mentor and a trainee. The trainee was carrying out familiarisation duties at the time with the expectation of taking up full time training. The mentor controller commented that she agreed to assist in his familiarisation training. Leading up to the Airprox, the trainee, albeit with some prompting from the mentor, made all the transmissions. The mentor only took over the frequency when the pilot of the B737 reported reacting to a TCAS RA climb. She described the workload as light. At the time of the Airprox the Aerodrome Traffic Monitor (ATM) was out of service. Consequently, the ADC had no radar information about the position of ac in the vicinity of the airport.

The B737 flight established communication with Edinburgh Approach at 1251, reporting at FL70, heading 347°. The pilot was informed it would be vectoring to the ILS RW06 and was instructed to turn L heading 335°. At 1253, the AC690 flight made its initial call on the frequency, reporting 3nm W of Polmont, a VRP situated at the western edge of the Edinburgh CTR which is Class D airspace from SFC to 6000ft. The APR responded *"clear to enter the zone at Polmont VFR not above altitude two thousand feet on QNH One Zero Two Two"*. The pilot confirmed the VFR clearance but made an error whilst reading back the altitude restriction. Once this was corrected, the controller requested the pilot to report at Polmont. The APR then informed the B737 flight it was 25nm from touchdown and instructed it to descend to 4000ft.

The AC690 flight reported reaching Polmont at 1254:48, whereupon it was instructed to contact the Tower frequency. (The ADC had already been advised of its arrival details.) On contact, just after 1255:30, the pilot reported overhead Polmont, inbound to the airport. He was requested to report at Philpstoun (a VRP situated

approximately 5nm NW of the airport) and following a query from the pilot the report point was repeated. The pilot reported reaching Philpstoun about 30sec later (just after 1256:30). The radar recordings of the event reveal that for both position reports the ac was approximately 4 and 5nm short of the VRPs respectively. He was informed about helicopter traffic leaving to the N, followed by clearance to *"join downwind left hand for runway Zero Six"*. This clearance was read back correctly. From its position at Philpstoun, the ac could have turned directly on to L base for RW06. The mentor explained that she would have carried out this action if she had been working on her own. However, for the trainee's benefit she decided to allow him to use the full standard cct phraseology. Shortly afterwards, further information was issued to the AC690's pilot about another overflying helicopter. Noticeably, the trainee issued both items of TI without any prompting from the mentor. At 1257:38, the APR telephoned to pass, in the circumstances due to the lack of the ATM, a standard 10nm check on the B737. This was the first time that the mentor and trainee were aware of the B737's position.

The AC690's pilot reported *"turning for left downwind Zero Six"* at 1257:59. The controller confirmed she was visual with the ac N of the airport, as it turned R to position downwind. The pilot was initially requested to report base but, after a repeat of the message was asked for by the pilot, it was changed, at the mentor's prompt, to *"report ready for base"*. However, some 20sec later (1258:40), the AC690 flight was instructed to *"report final runway Zero Six"*. The mentor assessed that the AC690 would turn on to final approach sufficiently far ahead of the B737, which she could also see. By now, the B737 was heading 030° to establish on the ILS RW06, descending to 2100ft. The AC690's pilot was not informed about the B737's position or warned of any need to tighten the cct.

At 1259, the pilot of the B737 was advised, by the APR, *"you may see working Tower is an Aero Commander downwind left hand runway two four"*. No comment was made about the incorrect RW information. Shortly afterwards, the B737 flight reported established on the LLZ and asked *"do you know what the intentions are of that other ac"*. The APR did not respond immediately whilst he telephoned the ADC to ask the intentions regarding the AC690. He was advised it was turning final. The APR reported that the B737 was at 6nm and then responded to the B737 flight, clearing it to descend on the ILS and *"the traffic previously mentioned traffic is turning northbound now I believe"*. The B737 flight was then transferred to the Tower frequency (1300:00). The RT and telephone recordings indicate that no turn to the N for the AC690 flight was ever mentioned by the ADC.

Just before the B737 flight was transferred from the Approach to the Tower frequency, the mentor ADC realised that the AC690 would not be able to position safely in front of the B737. Consequently, she instructed the trainee to turn the AC690 off the approach on to R base. The trainee transmitted just before 1300:00, *"AC690 c/s I've got to break you off if you can go around I say again go around and if you reposition for right base Zero Six"*. No reply was received so a further call was made *"AC690 c/s just confirm go around I say again go around reposition right base runway Zero Six"*. This time the pilot read back *"Right base Zero Six"*. It was reported that the pilot did not climb in reaction to this instruction but turned away to the S. TI was passed about the B737 on a 5nm final to RW06. Before any response was received, the B737 flight contacted the frequency (just after 1300:20) *"B737 c/s is on finals at four point nine miles we have an ac just going underneath us now that's a TCAS climb"*. The trainee answered *"roger"* followed by the mentor taking over the frequency asking to what level the ac was climbing. After a standby call from the B737 flight, the pilot of the AC690 reported he would be holding on R base until advised. The B737 flight then reported resuming the ILS, happy to continue and was cleared to land. Subsequently, the AC690 was the next ac to land after the B737.

[UKAB Note (4): The Lowther Hill radar recording shows the AC690 approaching Edinburgh from the WNW and entering the CTR, having passed 2nm N of Polmont VRP, at altitude 2000ft, Glasgow QNH1023mb. As the AC690 manoeuvres onto a downwind leg at Philpstoun the ac's Mode C indicates a climb to 2600ft before descending to 2100ft before the turn onto L base. The AC690 disappears from radar after the sweep at 1259:48 when it is seen established on L base descending through altitude 1900ft with the B737 3·2nm to its SSW turning R to establish on the RW05 LLZ descending through altitude 2300ft. The AC690 re-appears at 1300:38 showing altitude 1400ft in the B737's 12 o'clock range 0·4nm, the B737 showing NMC. The CPA occurs on the next sweep at 1300:44 with the B737 now level at altitude 1700ft with the AC690 still indicating 1400ft in its 0130 position range 0·2nm. The B737 maintains 1700ft for the next 2 sweeps before recommencing its descent as the AC690 continues to track SE'ly prior to repositioning onto final approach.]

The mentor commented, that without the ATM, she had to assess the position of the subject ac visually. She added that, except for a few occasions when the equipment was taken out of service briefly, she was not used to operating without it. On this occasion she believed that she misjudged the size of the AC690. She knew it was a

twin-engined ac but it was bigger than she realised. Consequently, she assessed it was closer to the airport than it actually was. Until she viewed the radar replay, she believed that the AC690 had crossed final approach ahead of the B737, rather than underneath it. With hindsight, she thought that she should have taken over the frequency earlier, certainly when the AC690 needed to be turned off the approach. She agreed that the phraseology used by the trainee was not appropriate to the circumstances. In the event, despite the inappropriate phraseology, the pilot of the AC690 carried out her intentions by turning R and not climbing.

It is understood that the ATC procedures used when the ATM is out of service are being reviewed locally and this will also involve other NATS airport units. Methods of training for such eventualities are additionally to be addressed.

## PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The NATS Advisor informed Members that the ATC procedures review meeting was due to take place on the same day as the present UKAB meeting. This meeting was to include Edinburgh and Glasgow ATSUs with any procedure or training methodology changes identified tasked to be implemented by the end of August 2008.

Members noted that the AC690 pilot had at least twice erroneously reported his position to ATC whilst inbound via the Edinburgh VRPs and had climbed to 2600ft whilst manoeuvring onto the downwind leg of the visual cct. That said, although these reports could have led the ADC to believe the AC690 was in fact closer to the aerodrome than it actually was, the ADC saw the ac as it turned downwind and believed that it would position well ahead of the approaching B737, having just received a 10nm range check on the latter. However, the ADC had misjudged the AC690's size and distance from the RW and omitted to give the AC690 pilot TI which would have aided him to visually acquire the B737 early and position himself accordingly. As it was, the AC690 pilot was not aware of the B737 and followed the ATC instructions ('report ready for base' then 'report final..'), which effectively placed no restriction on the cct pattern size to be flown. Without the benefit of the ATM, the ADC was unaware of the true relative positions of the subject ac. Members agreed that the ADC did not ensure adequate spacing between IFR and VFR arrivals which had caused the Airprox.

Looking at the risk element, the APR had unintentionally lulled the B737 crew into a false sense of security when the AC690 was seen by its crew on TCAS to be in the visual cct and in potential confliction. After speaking to the ADC, the APR told the B737 crew erroneously that the AC690 would be clearing away from their projected flight path to the N before he transferred the flight to the ADC frequency. Although this was factually incorrect, the B737 crew had been watching the AC690 on TCAS and had visually acquired the ac as it turned onto base leg slightly ahead and in confliction. The B737 crew were undoubtedly surprised when, during the frequency change, the AC690 did not turn away but continued on its SE'ly track which generated a TCAS TA. This was quickly followed by an RA 'adjust v/s' with which the crew complied and reported during their initial call on Tower frequency. Meanwhile, the ADC realised, at a late stage, that the AC690 would not be able to position safely ahead of the B737 and told the trainee to turn the AC690 off the approach onto R base, believing that the AC690 was further ahead of it and well placed to pass clear of it. However, the trainee used the inappropriate phrase 'go-around...reposition for R base'' which needed to be repeated before the AC690 pilot acknowledged with '...R base'. While waiting to make their initial call on frequency, the B737 crew heard some of these RT exchanges and were concerned that if the AC690 pilot executed a go-around climb it would have exacerbated the situation. Fortunately the AC690 pilot saw the B737 about the time when ATC told him to go-around and he heard the crew's initial call reporting a '...TCAS climb', quickly realising that any climb on his part would reduce the separation. The AC690 crossed just in front and 300ft below the B737 which levelled at 1700ft to avoid it. The Board were concerned that this encounter had occurred at low level with the B737 descending towards the AC690, whose pilot had limited options for collision avoidance. The B737 crew's situational awareness was reduced as they had erroneous TI and were not talking to the ADC before the Airprox happened. Also, without TI from the ADC, the AC690 pilot was unaware of the B737 until the last minute, even though the opportunity was there to see it established on the FAT for quite some time as he positioned his ac in the cct. All of these elements when combined were enough to persuade the Board that safety had not been assured during the encounter.

## AIRPROX REPORT No 028/08

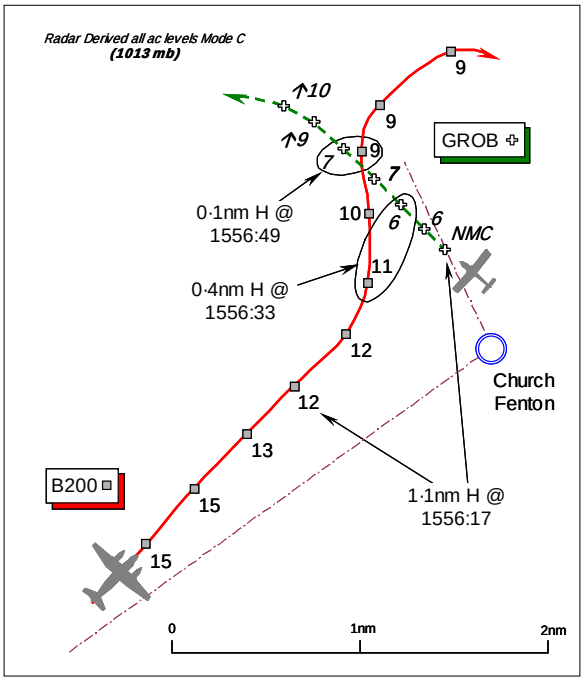
### PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Edinburgh ADC mentor did not ensure adequate spacing between IFR and VFR arrivals.

Degree of Risk: B.

# AIRPROX REPORT NO 029/08

| | | |
|---|---|---|
| *Date/Time:* | 18 Mar 1556 | |
| *Position:* | 5351N 00113W (1¼nm NW Church Fenton - elev 29 ft) | |
| *Airspace:* | Church Fenton MATZ | (Class: G) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | Grob Tutor | King Air B200 |
| *Operator:* | HQ AIR (Trg) | HQ AIR (Trg) |
| *Alt/FL:* | ↑800ft (QFE 1020mb) | 1300ft (QFE 1020mb) |
| *Weather* | VMC NR | VMC NR |
| *Visibility:* | 10+km | 10+km |
| *Reported Separation:* | 200ft V/200m H | 500ft V/200m H |
| *Recorded Separation:* | 200ft V/0·1nm H (~200yd) | |




## PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

**THE GROB TUTOR PILOT**, a QFI, reports that he was departing VFR on a local instructional sortie from Church Fenton whilst in communication with Fenton TOWER. A squawk of A4576 was selected with Mode C on. The ac has a white/blue colour scheme and the HISLs and landing lights were on.

On receipt of take-off clearance from RW34RHC, Fenton TOWER passed details of circuit traffic, including a BE200 King Air joining DEADSIDE, he thought. After take-off his student climbed the aeroplane ahead to 500ft QFE (1020mb) on the RW track of about 340° at 80kt, then turned left onto 330°. At 800ft QFE he [the QFI] sighted the King Air ½nm away some 2-300feet above his aeroplane, in the 09:30 position on a conflicting course at about 90° to his ac's course. Taking control of his aeroplane, to avoid the B200 he levelled off thus accelerating slightly and transmitted to TOWER that he was taking avoiding action. The King Air passed 2-300ft above and slightly behind – 200m minimum horizontal separation was quoted – in straight and level flight without appearing to deviate from its original flightpath. After the "closest point", control was returned to his student and the training sortie continued. He assessed the Risk as *"medium"* and added that his workload at the time of the Airprox was *"low"*.

No report of the Airprox was made on RT at the time, which was subsequently filed by telephone.

**THE BEECH KING AIR B200 PILOT**, a QFI, reports that he was inbound to Church Fenton from Cranwell and joining the RW34RHC, DEADSIDE, from a radar-to-visual approach [to RW06] from the SW on a pre-booked Practise Diversion (PD).

In the descent to cct height at Church Fenton for visual circuits and in communication with Fenton TOWER on 234·1MHz, the controller had passed circuit information and they had identified the reported Grob Tutors. In particular they had sighted the closest departing Tutor ac from a range of 4nm, which stood out well against the dark background. Whilst on a closing heading of 010-030°(M) at 160kt and with the subject Tutor ac in sight he, as the Captain of the BE200, assessed that it was safer to keep the climbing Tutor in his King Air's 1-2 o'clock position - low - rather than to turn L to parallel the ac and the circuit pattern. There was an assessed risk that the Tutor might go unsighted behind the starboard engine and wing if a L turn had been commenced. No avoiding action was required but he elected to stay high at 1300ft QFE (1020mb) and passed slightly behind the subject Grob – 200m - as the rate of climb of the departing traffic was not considered sufficient to cause a conflict. He assessed the Risk as *"low"* and the minimum vertical separation as 500ft. Neither crewmember in the King Air

heard an avoiding action call from the Tutor crew as they were engaged in the checks/actions and verbal confirmations necessary to configure the King Air for the cct with a *"medium"* workload.

On return to Cranwell, a telephone call was received from the Tutor pilot and the actions/reasons for the encounter explained.

His ac has a white/blue colour scheme, the HISLs landing lights anti-collision beacon and recognition lights were all on. Although the ac is fitted with TCAS, at the request of ATC the SSR was selected to 'standby'. Consequently, the system was inhibited and no TAs/RAs were enunciated. [This request was made by TOWER at 1557.00, just after the Airprox occurred.]

**THE CHURCH FENTON AERODROME CONTROLLER (TOWER)** reports that he was controlling during a steady day of circuit movements with CC WHT/BLU conditions and RW34RHC in use.

There were 3 Tutors in the visual cct and the subject Tutor on the RW cleared for TAKE-OFF on RW34RHC. In accordance with local orders to avoid Sherburn-in-Elmet and Burn airfields, the King Air had been vectored for a radar-to-visual approach to RW06, to 'break-off' when visual and join DEADSIDE for RW34RHC. On calling TOWER, the normal joining details were passed to the King Air crew informing them to join DEADSIDE RW34RHC and that there were 3 ac in the cct with one on the RW for departure – the subject Grob.

The King Air appeared to turn DEADSIDE a little later than normal, turning behind the subject Grob that was departing and now upwind. Turning behind the Grob, the King Air made a R turn crosswind for RWY34RH. He observed the subject Grob crew lower the nose slightly and he was waiting for a possible call for a 'FAN-STOP' however nothing was said. The subject Grob then departed VFR as planned and changed to LINTON DEPARTURES.

After two ccts with 3 Tutors in the same cct, the King Air pilot decided it was too busy for his requirements so he carried out a VFR departure to the East.

**MIL ACC** reports that the Beech King Air crew conducted a radar-to-visual recovery to Church Fenton on a Practise Diversion. Church Fenton is an ADC-only airfield; radar approach services are provided from Linton-on-Ouse ATC C/S Fenton APPROACH (APP). When RW34RHC is in use for visual ccts the constraints imposed by the Radar Vector Chart (RVC) and the position of adjacent civil airfields require that ac are vectored to RW06 at 1800ft QFE. The pilot must be visual by 2nm or a missed approach is to be carried out.

APP stressed to the B200 crew during the radar to visual approach to RW06 that Church Fenton was using *"..RW34 right hand* [cct].." and at 1551-31 to *"..expect to break off at 2 miles and join DEADSIDE runway 3-4 right hand when 2-way with TOWER".* This was acknowledged by the B200 crew who, when visual, called Fenton TOWER to join DEADSIDE to RW34RHC in accordance with this procedure.

The Grob crew was given clearance to TAKE-OFF by Fenton TOWER on UHF 234·1MHz at 1554:53, which was immediately acknowledged. The B200 crew then called to join the visual circuit on the same frequency at 1555:04, *"Fenton TOWER* [C/S] *request join"*. TOWER cleared the B200 crew to join and passed the cct state "[C/S] *Fenton TOWER join DEADSIDE runway 3-4 right hand QFE 1-0-2-0, surface wind 3-3-0 12 knots 3 in and 1 on for departure* [the subject Grob Tutor]". This clearance was acknowledged by the B200 crew at 1555:18, *"join DEADSIDE runway 3-4 right hand 1-0-2-0* [C/S]". The next call was from the Grob Tutor crew reporting at 1556-45, "[C/S] *departing left hand turn outbound avoiding the King Air DEADSIDE";* this was acknowledged by the ADC but a note in the RT transcript records that at this point the B200 was not DEADSIDE but had turned right and was effectively CROSSWIND. It was not until 10sec after this transmission at 1557:00 that the B200 crew was instructed by the ADC to *"squawk standby please"*.

The TOWER Controller's response to the B200 crew's request to join the cct was in accordance with JSP552 and the cct state was passed. Although the radar-to-visual procedure for RW34RHC at Church Fenton has an Initial Point (IP) – *INITIALS* - the B200 pilot did not report INITIALS and therefore was not *updated* with the cct state. Despite this the B200 instructor reports that he was visual with all of the circuit traffic. Therefore, this Command considers that there were no mil ATC factors in this Airprox.

UKAB Note (1): The LATCC (Mil) recording of the Claxby Radar shows both ac as SSR returns only during the encounter with the B200 King Air running in to Church Fenton at 1500ft (1013mb) – broadly 1710ft QFE (1020mb) – before descending further as it approaches within 1¼nm of the aerodrome. The Grob Tutor is not shown until 1556:17, departing NW'ly then levelling for two sweeps at 600ft (1013mb) as the King Air closes from the Grob's port side indicating 1200ft (1013mb). At 1556:33, the twin is shown after steadying briefly on a northerly course at 1100ft with the Grob at 1 o'clock - 0·4nm some 500ft below the King Air. The Grob climbs slightly 100ft to 700ft (1013mb) – about 910ft QFE – as the King Air passes astern and descends to 900ft (1013mb) – about 1110ft QFE – at the CPA of 0·1nm (about 200yd) before turning R into the cct. The Grob then resumes the climb and departs to the NW.

**HQ AIR (TRG)** comments that the Tutor QFI did not sight the King Air until it was ½nm away on what appeared to him to be a conflicting course. The King Air pilot had the departing Tutor ac insight from a range of 4nm and was maintaining visual separation. The actual separation distance, controlled by the King Air pilot, was close enough to cause concern to the Tutor instructor who took avoiding action by levelling off; he did not know that the King Air crew had them in sight throughout 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, reports from the air traffic controllers involved and reports from the appropriate ATC and operating authorities.

It was clear to the Board that a significant aspect to this Airprox was that the approach conducted by the King Air crew into Church Fenton was not to the active runway but a 'Radar to Visual' for RW06 to 'break-off' to join DEADSIDE for RW34 which, significantly, has a RH cct. The Mil ACC report had stressed that when RW34RHC is in use for visual ccts, local obstructions and the resultant constraints imposed by the Radar Vector Chart (RVC), together with the relative position of adjacent airfields and their traffic patterns, required ac inbound to Church Fenton to be vectored to RW06 at 1800ft QFE before being switched to TOWER to effect their cct join from the DEADSIDE. It was clear from the King Air pilot's account that subsequent to TOWER's clearance to join the cct he had acquired the reported cct traffic visually, including the Grob Tutor flown by the reporting pilot at a range of 4nm. Military controller Members stressed that the cct traffic state had been correctly transmitted by TOWER with the joining clearance in accordance with normal Military ATC SOPs from the outset and had included the reporting pilot's ac as the "..*1 on for departure"*. However, civilian Members were concerned that under this procedure no specific traffic information was subsequently forthcoming to the Grob pilot about the King Air. Moreover, in this way no indication about the direction from which the twin was joining the cct was given by the King Air crew, in their first joining call, to the other cct pilots. Unless whilst preparing to take-off the Grob QFI had picked up from the 'Radar to Visual' calls broadcast by TOWER that the King Air was inbound on RW06, there was nothing else to indicate to him that the King Air was running in from his port beam instead of joining along his port side into the DEADSIDE from astern. Furthermore, the Mil ACC Advisor pointed out that the King Air pilot had not made a call at INITIALs (the Initial Point (IP) situated at 3nm on the extended centre-line for RW 06) which is where TOWER would have updated the cct information with the actual position of ac in the cct. From the King Air pilot's perspective this was of little consequence as he had already spotted all the circuiting ac and the departing Grob, but this RT call would have been the important additional warning to all other pilots in the cct listening out on the frequency about the presence of the joining King Air. Thus, a salutary point here was that an RT call of "INITIALS for 06" would have highlighted for the benefit of all concerned that the twin was running in from the SW. It seemed that the Grob pilot had been somewhat surprised when he spotted the twin ½nm away approaching rapidly some 2-300feet above his aeroplane, flying towards him at about 90° to his ac's course. Nevertheless, the Board was briefed that the King Air pilot had flown the approach as established up to the point that he entered the cct area. It was the subsequent L turn northerly in the DEADSIDE that surprised some pilot Members. A CAT pilot Member, more used to civilian cct procedures, opined that he would have joined via a R turn in the overhead - long way round – thereby in conformity with the RHD cct direction. However, the Board recognised that the King Air pilot's expressed concern that if a tight L turn had been made the Tutor might go unsighted behind the starboard engine and wing was well founded. The King Air QFI had opined that keeping the climbing Tutor in his ac's 1-2 o'clock position - low - rather than to turn L to parallel the ac's track and the circuit pattern was preferable. However, he was the one joining the cct and therefore had to ensure that he not only 'gave way' to existing cct traffic but also that he afforded appropriate separation as he did so. Unfortunately, the radar recording did not show all the other circuiting ac so the exact position of the cct traffic at the time the King Air turned was not clear and may have been a factor here.

Pilot Members confirmed the King Air pilot's point that both he and the PF would have been ensuring that the ac was configured correctly for the join, which resulted in an increased workload and necessitated a fair amount of 'heads-in' time whilst completing cockpit checks. Nonetheless, this was exactly the time that eyes needed to be 'out of the cockpit': it was the crew of the King Air that determined the separation here and they chose to fly 200m from the Grob according to the King Air QFI's account – a point agreed by the reporting pilot and confirmed by the radar recording. However, the King Air pilot had assessed that he was 500ft above the Grob when he flew past, compared to the Grob pilot's estimate of 200ft. Whilst recorded radar data reflected that the King Air was 500ft above the Grob at a range of 0·4nm with the light ac out to starboard, the twin was only 200ft above the Grob and 200yd away as the King Air passed astern at the CPA. Clearly, the Grob would have passed under the nose of the King Air as this occurred and the latter's crew might have been unsighted for a short while. However, it was evident that they were entirely cognisant of the position of the Grob as they turned to pass astern. Nonetheless, the Grob pilot's concerns were well founded and it is preferable to give ac flown by student pilots, albeit with an instructor, as wide a berth as is feasible. The Board concluded that this Airprox had resulted because the B200 King Air crew's chosen flight path caused the Grob instructor concern but in the circumstances conscientiously reported here, Members agreed unanimously that there was no risk of a collision between these two ac.

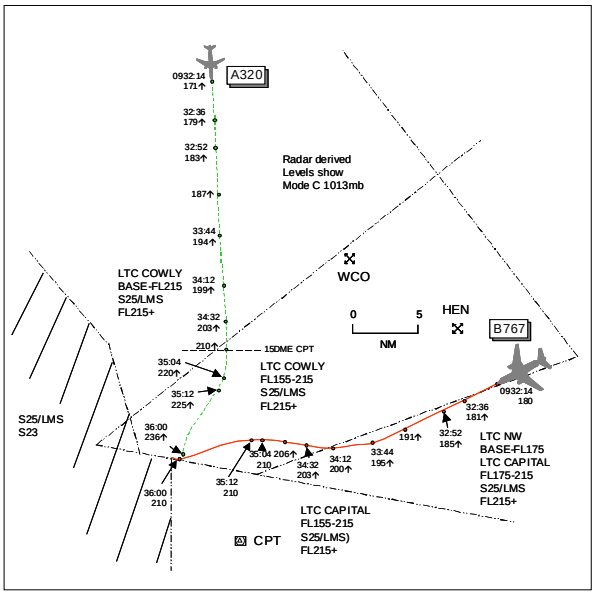
## PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The B200 King Air crew's chosen flight path caused the Grob instructor concern.

Degree of Risk: C.

# AIRPROX REPORT NO 030/08

| | | |
|---|---|---|
| *Date/Time:* | 24 Mar 0936 | |
| *Position:* | 5136N 00121W (7nm NW CPT) | |
| *Airspace:* | AWY N859/L9 | (Class: C) |
| *Reporter:* | LACC S25/26T | |
| | *1st Ac* | *2nd Ac* |
| *Type:* | A320 | B767-300 |
| *Operator:* | CAT | CAT |
| *Alt/FL:* | ↑ | ↑FL210 |
| *Weather* | VMC NR | VMC CAVOK |
| *Visibility:* | NR | Unrestricted |
| *Reported Separation:* | | |
| | 400ft V/3nm H | 1000ft V/1-2nm H |
| *Recorded Separation:* | | |
| | 1000ft V/5·5nm H OR | |
| | 2600ft V/0·4nm H | |




## PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

**THE LAC S25/26(LMS) TACTICAL** reports that the A320 outbound from East Midlands was heading S on a standing agreement, slow climbing/transfer from LTC Midlands and he recleared the flight to FL260. The ac was out of FL201 when he spotted it in confliction with a W'bound ac, the B767, climbing to FL210 out of FL201 passing CPT. He told the A320 flight to expedite climb through FL220 and make an avoiding action R turn onto heading 260°. The B767 was not on his frequency, working S23. He believed that the A320 should have been coordinated by LTC Midlands with LTC Capital as slow climbing traffic through their airspace as it was traffic that they did not usually work.

**THE LAC S25/26(LMS) PLANNER** reports she received a call from S23 asking for climb on the B767 approaching CPT W'bound. She looked at the radar and saw this ac above the A320 so gave RFC (release for climb). As she said this, STCA activated and she realised that the A320 had also been climbed so re-iterated to S23 to climb the B767 hoping it would outclimb the A320. As she was saying this she heard his Tactical controller expediting the A320 through FL220 to get above the B767 so she phoned S23 back to tell them to change the plan. She informed S23 that the A320 was expediting through FL220, so could they stop-off the B767. The S25T then gave the A320 an avoiding action turn to help the situation as well as TI. The B767 did stop climb at FL210.

**THE LAC S5/23 TACTICAL** reports that 4mins after 'plugging-in' the B767 flight outbound from Stansted checked-in on frequency at FL194 climbing to FL210 on heading 265°. Her Planner had telephoned LMS and said that she could climb the flight so she turned it R onto 285° and climbed it to FL300. On looking back at the radar she saw the A320 also climbing and heading directly at the B767. Her Planner pointed the traffic out to her and told her to stop the B767 off at FL210 which she did as well as turning it L onto 260°; at this time the A320 was still about 400ft below the B767. The B767 crew did not respond so she gave avoiding action and TI and 5nm was achieved at the same level. Once the subject ac were clear of each other, she climbed the B767 to FL300 before handing the sector over to another controller.

**THE LAC S23 PLANNER** reports the B767 flight called the S23T on the standing agreement from LTC Capital climbing to FL210. As is standard he phoned LMS to obtain RFC to FL280 simultaneously with conflict alert activating against the S'bound A320 slow climbing about FL190-200. Thinking that Capital had stopped the A320 off at FL200, the B767 was climbed to FL280. LMS phoned back immediately telling them to stop the B767 at FL210 as they were climbing the A320. It was apparent that separation was about to be lost as the A320 continued its climb so they gave avoiding action to the B767 and instructed the flight to level at FL210. Vertical separation was achieved with just about 5nm separation but it was never assured.

## AIRPROX REPORT No 030/08

**THE LTC COWLY/WELIN (MIDLANDS) RADAR CONTROLLER** reports Capital coordinated climb in Midlands airspace [the B767] to FL210 in the vicinity of Luton, the A320 was climbing to FL220. The A320 was not going to make the standing agreement level of FL220 15nm before CPT so he phoned Capital to warn them of the traffic.

**THE LTC VATON/COMPTON (CAPITAL) RADAR CONTROLLER** reports mentoring a trainee as the B767 was on departure from Stansted exiting via CPT, the flight reporting climbing to FL160. The trainee telephoned Midlands for climb, which was approved, and step climb was given to FL180, then FL200 and eventually FL210. At some point Midlands phoned and said the A320, an East Midlands departure, was going to be slow climbing and might not make FL220 5nm before the CPT restriction. He monitored the situation and assessed that the traffic would be FL220 before crossing the track of the B767. He then noticed the A320 flight had now set FL260 as its SFL on Mode S and had a good ROC and he was happy with the situation. For positioning, the trainee turned the B767 R from 260° onto 280° and transferred the flight to the BRS (S23) Sector. This was going to lessen the separation so he, the mentor, telephoned LMS Sector to point this out, noticing at this point that the B767 had FL300 as its Mode S SFL having now been cleared through the level of the A320. The LMS Planner answered but immediately terminated the call. He then telephoned the BRS (S23) Sector and they informed him that the B767 had been descended back down to FL210, having reached FL214, he thought. Meanwhile the A320 had been turned R and continued its climb to FL260.

**THE A320 PILOT** reports outbound from East Midlands to the Canary Islands IFR and in receipt of a RCS from London squawking with Modes C and S. A TCAS TA was received on traffic climbing from below and about 5nm to their L. Visual contact was made with a B767 followed by an avoiding action message from LTC to turn R 90°. The Capt, PF, disconnected the A/P and commenced turning R at 30° AOB. Visual contact was maintained throughout with minimum separation approximately 3nm and 400ft. Track and climb were regained to SAM VOR after turning through 40°. They did not report anything to LTC but the controller was aware of the other ac although he thought it was working another frequency as no report was heard from them. Their ROC prior to the incident was low owing to their heavy weight and managed performance but the climb rate increased during the turn with the Flight Directors off. He assessed the risk as low.

**THE B767 PILOT** reports outbound from Stansted to the USA IFR and in receipt of an ATS from London squawking with Modes C and S. Climbing to FL210 heading 285° at 295kt (ROC 1500fpm) they were cleared to climb to FL300. Approaching FL210 an amended clearance was received to maintain FL210 and to turn onto heading 260° simultaneously with a momentary TCAS TA. They levelled-off at FL210 and turned and the other ac was sighted, a low wing airliner, in their 2 o'clock range 1-2nm about 1000ft above which initiated a climbing R turn away from them. No RA was generated during the encounter and he assessed the risk as low.

**ATSI** comments that at the time of the Airprox, LTC Midlands was operating with Cowly and Welin sectors bandboxed and no Coordinator. Traffic levels and workload were described as low. LTC Capital was also operating in a bandboxed configuration (Compton and Vaton) and no Coordinator. The radar controller was acting as an OJTI to a trainee who was valid on LTC Midlands and extending to LTC Capital. Traffic was described as light to moderate and the sector being 'not particularly busy'.

LAC Sector 23 was bandboxed with Sector 5 whilst LMS (Sectors 25 and 26) was also bandboxed with an OJTI and very early stage trainee operating the Tactical position. Both S5/23 and S25/26 reported traffic and workload as medium.

The A320 departed East Midlands, following a DTY 2N SID, and called LTC Midlands at 0924:55. The controller directed the crew to climb, in stages, until at 0929:20 when they were instructed to turn L heading 165° and climb to FL220. The standing agreement level for transfer of such outbounds from LTC Midlands airspace to LMS is climbing to FL220 to be level 15nm before CPT. If the ac does not make this level then it will enter LTC Capital's airspace rather than overflying it. The LTC Midlands controller placed no such restriction on the flight as he believed the ac would make that level without difficulty.

Shortly before this climb clearance to FL220 was issued, the B767 crew established contact with LTC Capital and reported passing FL140 for FL160 heading 245°. The LTC Capital trainee then telephoned LTC Midlands and requested further climb for the B767, which was approved. At this time, the two ac were 50nm apart. The B767 was cleared to FL170 and then to FL180 before being instructed to turn R heading 260°.

At 0932:15, the A320 crew were instructed to contact the LMS controller. At the time, the ac was passing FL171 for FL220 with 34nm to run to CPT with the B767 in its 10 o'clock at a range of 31nm. Whilst the A320 crew were changing frequency, the LTC Capital trainee instructed the B767 crew to climb to FL200. Shortly after this clearance was issued, LTC Midlands telephoned the LTC Capital trainee and pointed out the A320, which was just to the S of Daventry, and indicated that it was a little slow in climbing. The trainee acknowledged this fact and advised he would monitor the situation.

At 0932:50, the A320 crew reported on the LMS frequency and was instructed to climb to FL260. At this time the A320 was 30·5nm N of CPT while the B767 was 18·5nm NE with both ac on converging tracks. Some 15sec after the A320 flight had been instructed to climb to FL260 (0933:05), the LTC Capital trainee instructed the B767 crew to climb to FL210 and turn R heading 280° before instructing the crew to contact the Sector 23 Tactical controller. When the B767 crew called on the S23 frequency (0933:45) they were instructed to turn R heading 295° to position the ac appropriately in respect of other traffic.

At 0934:10, when the two ac were 15·4nm apart, the LMS trainee instructed the crew of the A320 to expedite their climb through FL220. At the same time, but unknown to the LMS Tactical mentor, a telephone conversation took place between the LMS Planner and the S23 Planner. The S23 Planner requested further climb on the B767, which would take it through LMS airspace for a short time. The LMS Planner agreed that the B767 was released for climb to FL280. During this conversation, at 0934:19, STCA activated when the ac were 14nm apart. Thereafter followed a series of transmissions and telephone calls.

The LMS trainee instructed the A320 crew to expedite their climb through FL220 before the mentor took over the RT and instructed the crew to turn R heading 260° as avoiding action. Meanwhile at just before 0934:30, the S23 Tactical instructed the B767 to climb to FL300 before instructing the crew to stop their climb at FL210 and turn L heading 280°. This turn instruction was repeated as avoiding action and TI passed. At the same time, the LMS Planner telephoned the S23 Planner and said that they were climbing the A320 so the B767 crew should be instructed to stop their climb.

[UKAB Note (1): The turns soon took effect and by 0935:04, when lateral separation was 5·5nm, vertical separation was 1000ft. Thereafter, by the time that the 5nm lateral separation was breached (0935:12 4·5nm), the vertical distance between the ac was 1500ft and so standard separation was maintained throughout. The CPA occurs 0936:00 as the A320 climbs through FL236 and passes 0·4nm NE of the B767, 2600ft below.]

The unit investigation found that by not issuing an instruction for the A320 crew to be level FL220 15nm before CPT, the LTC Midlands controller did not ensure separation against traffic such as the B767. The LMS controller did not reiterate the need to be level 15nm before CPT and so the 'built in separation' was lost. The LTC Midlands controller believed that the strong N'ly wind, which was present on the day of the Airprox, contributed to the lower than usual climb gradient of the A320.

The LTC Capital mentor had noted the potential for confliction between the A320 and the B767 but dismissed it. The trainee telephoned LTC Midlands to coordinate further climb for the B767 and neither the trainee (who was a valid LTC Midlands controller) nor the in-situ Midlands controller made any reference to the A320 during the coordination conversation. As the Capital mentor monitored the situation he realised that the two ac were likely to conflict: however, he assumed his trainee had spotted this. This assumption was reinforced by the fact that the trainee was instructing the B767 to climb in steps and the trainee had advised LTC Midlands, in a previous telephone call, that he would monitor the A320. It was only after the B767 crew was transferred to S23 that the mentor was made aware that the trainee had not spotted the developing confliction. The mentor telephoned S23 but the call was never answered.

The S23 controller had instructed the B767 to turn R in order to position it against other traffic. The confliction was brought to the controller's attention when she saw STCA activate. The Planner had advised her that the B767 was released for further climb and so elected to resolve the confliction by climbing the B767 to get above the A320. The Planner then instructed her to cancel the climb on the B767, which she duly did.

The LMS mentor had noted the A320 when it came onto the frequency and believed that it might not make the agreed level. However, he was not unduly concerned as it was only climbing to the base of LMS airspace and so there would be no LMS traffic to conflict. He advised that LMS would have had strips on both the B767, in the event of S23 requesting climb into their airspace, as well as a strip on the A320. During his scan he detected the

conflict and instructed the trainee to expedite the climb of the A320 through FL220 as he mistakenly believed that the B767 was only climbing to FL210.

The LMS mentor was unaware of the telephone calls taking place between the LMS Planner and S23 in that the B767 would be climbing above FL210. He was convinced that the conflict would be resolved once the A320 was at or above FL220 and he only took the RT and passed avoiding action as a 'belt and braces' action. Verbal communication between the LMS Tactical and Planner were non-existent: however, the A320's strip was clearly marked as climbing to FL260. The LMS Planner had formulated a very different resolution to the conflict and this was communicated to S23 and not to the LMS Tactical.

**NATS UNIT INVESTIGATION** reports that following this incident it recommended that NATS Human Factors department conduct an assessment into decision making processes and interactions between Tacticals and Planners under stressful or high workload situations in order to provide guidance on techniques for preventing similar communication failures within the T and P team.

## PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members noted that of the 4 sectors involved with this fairly complex Airprox, LTC Midlands, Capital and LAC LMS could have each helped to prevent it. The start of the chain of events began when the Midlands controller did not ensure that the S'bound A320 achieved the 'FL220 15nm before CPT' level restriction and this had contributed to the Airprox. That said, the LMS Tactical had noticed it being about 1000ft low when it was transferred to his frequency. The Capital controller telephoned Midlands for a higher level on the B767, which was approved (to FL210) but no mention was made of the A320. Later, Midlands called Capital and pointed out the slow climbing A320 but did not specify that the B767 should be climbed underneath it. The Capital mentor saw the potential for confliction but assumed his trainee had also. Members thought that the mentor should have been more proactive and made sure his trainee kept the B767 below the A320 and intervened before the B767 was transferred to LAC S23. Members agreed that the Capital mentor had allowed his trainee to climb the B767 into conflict with the A320 which had caused the Airprox. Members also agreed that the LMS Tactical and Planner controllers were not acting as a team. When S23 requested higher for the W'bound B767, the LMS Planner did not refer to the fpss and approved climb without mentioning this to her Tactical who was already climbing the A320.

Risk-wise, eventually the deteriorating situation was noticed by the S23 and LMS Tactical controllers. LMS Tactical had instructed the A320 flight to expedite climb and then turned the flight R to increase separation. The S23 Tactical had initially tried to resolve the confliction by climbing the B767 but eventually was told of the agreed coordination between S23 and LMS Planners and stopped the B767 at FL210. The A320 crew received a TA alert and saw the B767 clear to their L before following the avoiding action R turn away. The B767 crew had followed the ATC instructions and levelled-off at FL210, receiving a momentary TA during their turn away, and sighted the A320 visually well clear to their R and above. These combined actions taken by all parties led to no breach of standard separation, allowing the Board to conclude that any risk of collision had been effectively removed.

## PART C: ASSESSMENT OF CAUSE AND RISK

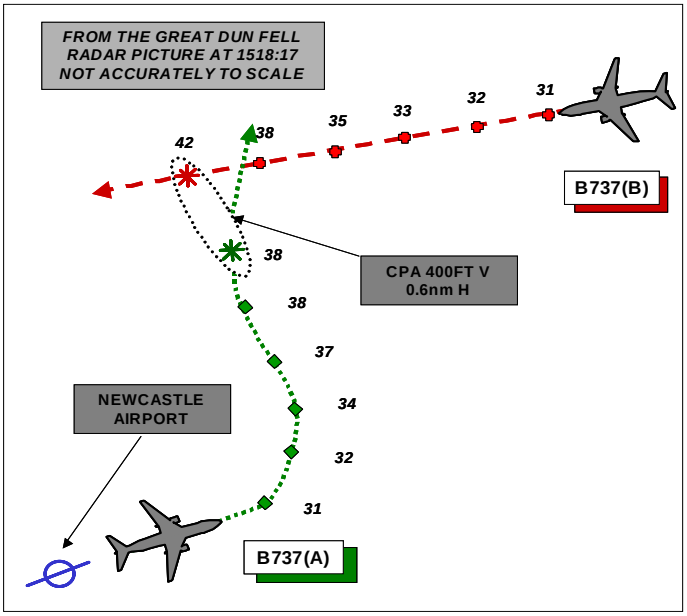
Cause: The LTC Capital mentor allowed his trainee to climb the B767 into conflict with the A320.

Degree of Risk: C.

Contributory Factors: The LTC Midlands controller did not instruct the A320 to achieve FL220 15nm before CPT.

## AIRPROX REPORT NO 031/08

| | | |
|---|---|---|
| *Date/Time:* | 21 Mar 1510 | |
| *Position:* | 5506N 00137W elev 266ft) | (3nm NNE NEW - |
| *Airspace:* | Newcastle CTR | (Class: D) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | B737-800 | B737-700 |
| *Operator:* | CAT | CAT |
| *Alt/FL:* | 3500ft (990mb) | 2500-5000ft↑ (QNH 990mb) |
| *Weather* | NR Sct Cloud | IMC KLWD |
| *Visibility:* | NR | 0nm |
| *Reported Separation:* | 600ft V/1nm H | 200ft V/1m H |
| *Recorded Separation:* | 400ft V/0.6nm H | |




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

**THE B737(A) PILOT** reports that he was in a very high workload situation on a scheduled passenger flight to Newcastle [RW07] after the 2nd go-around [due to high crosswinds, gusting 47kt]. Having decided to divert to Edinburgh, he was flying at 220kt in a left turn onto 280° as instructed by Newcastle APR and was passing 3500ft in the climb to FL100 when he received instructions from ATC, which he initially followed, to maintain altitude and to turn right but a TCAS RA (Descend) ensued so he followed it. He did not see the other ac but had seen it on the preceding go-around and he assessed the risk as being 'Major'.

**THE B737(B) PILOT** reports that after a go-around at Newcastle [RW07] due to high crosswinds, they were instructed to climb straight ahead to an altitude of 2500ft. On reaching 2500ft they were turned onto a downwind heading of 275° at 210kt and were given a further climb to 5000ft on the QNH of 990mb. They received a TCAS 'TA' followed by an instruction from ATC to expedite their climb with which they complied but they then received a TCAS RA [climb] instruction. They complied with the RA instruction and once clear of the conflict, levelled off at 5000ft and informed ATC. On landing he spoke to the ATC Supervisor to discuss the event and was informed that the separation had reduced to 1nm and 200ft. He assessed the risk as being very high.

**THE NEWCASTLE CONTROLLERS** provided reports which, for brevity, have not been included since the details are basically the same as outlined in the ATSI report below.

**ATSI** reports that at the time of the incident Newcastle Airport was experiencing strong crosswind conditions leading to a number of ac carrying out go-arounds. Both the Radar 1 and 2 positions were open. The Radar 1 Controller described his workload as light to moderate and he was vectoring two ac in addition to one of the go-around ac. In accordance with the Newcastle MATS Part 2, Section 4, Chapter 2, Page 1, *'When manned, Rad 2 is responsible for the control of arriving flights within P18 from the south. However, in extremis, departing flights may be delegated to Rad 2 when there is a possibility that Rad 1 is, or will become, overloaded'*.

B737(A) was vectored to an ILS approach to RW07 by the Radar 2 Controller and, at 1501, the pilot reported established on the Localiser and was cleared to descend on the ILS and transferred to the TWR frequency. Shortly afterwards, the pilot of B737(B) established communication with the Radar 2 Controller, reporting at FL160 and heading 010°. For the next few minutes B737(B) was vectored towards the approach and descended to 3500ft. At 1506:26, B737(A) returned to the Radar 2 frequency having carried out a go-around due to the wind conditions. The ac was subsequently vectored left-hand downwind to position behind B737(B) and climbed to 3500ft.

B737(B) was given further descent to 2000ft and, at 1510:30, was placed on a heading of 025° to close with the Localiser from the right and cleared to descend on the ILS once established. Meanwhile, the pilot of B737(A) stated his intention to divert to Edinburgh if his next approach was unsuccessful and Radar 2 Controller informed Radar 1 Controller of the pilot's intentions. B737(A) was then positioned on left base number two, descending to 2500ft, before being turned towards the ILS. B737(B) was cleared for the ILS, reducing speed to 160kts and it was transferred to the TWR frequency at 1512. One minute later B737(A), having been instructed to reduce speed to 160kts or less, reported established. The pilot was cleared for the ILS as number two, with number one (B737(B)) being 5nm ahead of them. B737(A) pilot reported visual with the ac ahead and was transferred to the TWR frequency at 1513:40. In the period from 1507-1513, six wind checks were transmitted on the Radar 2 frequency, these varying from 350°-360° at 27-34kts.

As soon as B737(B) pilot contacted the TWR frequency at 5nm, he was cleared to land on RW07, with a surface wind of 360°/29kts and a warning of a gust in the last five minutes of 47kts. Further wind checks were passed during the approach, the highest speed being 34kts. B737(A) reported on the ILS at 5nm on the TWR frequency at 1514:30. The pilot was instructed to continue the approach, just becoming number one, when shortly afterwards B737(B) carried out a go-around. B737(A) was then cleared to land and advised that the one ahead had missed its approach.

After the go-around, the ADC instructed B737(B) pilot to climb straight ahead to 2500ft in accordance with the standard Missed Approach Procedure. The Radar 1 Controller co-ordinated with the ADC for B737(B) to contact the Radar 2 Controller and B737(A) to be transferred to him in the event of it carrying out a go-around. The Radar 1 Controller explained that as the former was remaining in the pattern it would be vectored by Radar 2 and the latter, intending to divert, would work him. Consequently, B737(B) was transferred back to the Radar 2 Controller. Some ten seconds later the pilot of B737(A) reported going around and he was also instructed to climb straight ahead to 2500ft and shortly afterwards was transferred to the Radar 1 frequency. Accordingly, the subject ac were now under the control of different controllers, albeit they were sitting next to one another.

B737(B) pilot re-contacted Radar 2 at 1516:10, reporting maintaining 2500ft on RW heading and was instructed to turn left heading 275° for vectoring to the ILS. Subsequently the pilot reported that he would *"like to take up the hold for a short time while this squall goes through"* and he was cleared to climb to 5000ft, with no change of heading, at 1517:20. Meanwhile, B737(A) pilot had contacted Radar 1 as they passed overhead the airport, 5.5nm behind B737(B) which had just commenced the left turn. B737(A) pilot reported at 2500ft, routeing straight ahead. He then requested to divert to Edinburgh and was cleared to climb to FL100 on a heading of 280°. Because, at the time, B737(A) was on the climb-out path, approximately one mile NE of the airport, this turn instruction did not comply with the noise restriction routeing for RW07 which is straight ahead to 4.5D NEW, then a left turn. (ATSI Note: Although not a factor, this routeing differs from that published in the UKAIP, which is in the process of being amended). The climb and turn instruction to B737(A) was issued at the same time as the Radar 2 Controller climbed B737(B) to 5000ft. The subject ac were then on conflicting flight paths. The radar photograph, timed at 1517:20, shows the ac 4.8nm apart and at the same level with B737(B) turning through a northerly heading onto its assigned heading 275° and B737(A) still on runway heading but shortly afterwards it also commenced its left turn. The Radar 1 Controller could not explain why he had overlooked the presence of B737(B) and turned B737(A) towards it. He commented that the newer headsets, with tighter fitting to the ear, reduce the ability to overhear adjacent colleagues and he may have missed hearing the transmissions made to B737(B). Nevertheless, he was aware that B737(B) had carried out a missed approach ahead of B737(A), as he had co-ordinated their respective frequencies with the ADC Controller. Furthermore, the Radar 1 Controller could not explain why he did not comply with the noise routeing, by turning B737(A) before 4.5D. Had he waited until that point, the incident would not have occurred as B737(A) would have been positioned behind B737(B) which had commenced its left turn at about that distance.

The two controllers realised the situation at about the same time and both took action to try and resolve the conflict. The Radar 1 Controller reacted instructing B737(A) *"can you er turn right onto a heading of er two er two zero there is traffic crossing you er right to left at the moment in your twelve o'clock range three miles"*. The pilot's reply was blocked by simultaneous transmissions. When the turn instruction was passed, both ac were at FL32, 2.6nm apart, B737(B) tracking W and B737(A) SW of it, about to turn through N. The Radar 1 Controller agreed that the instruction to turn onto the heading could have sounded somewhat confusing; also, he did not use the phrase 'avoiding action'. The controller continued, *"if you can stop your climb the traffic will be climbing above you"*. Then he asked the pilot [of B737(A)] if he had the other ac in sight, to which the pilot replied *"TCAS descent"*. The controller responded, at 1518:30, *"you can er turn er left now onto a heading of er two eight zero degrees"*. The

radar photograph shows B737(A) in a right turn, passing 0.7nm behind B737(B) and 1000ft below Mode C. Twenty seconds earlier, both ac had been at FL38, 1nm apart, with B737(B) still tracking W and B737(A) starting to turn right to the S of it. The issuance of [the second] heading instruction onto heading 280° was contrary to the procedures [following a TCAS RA] stated in MATS Part 1, Section 1, Chapter 9, Page 2, 'On being informed that an ac is manoeuvring in accordance with an RA, **a controller must not issue control instructions** to that ac'. The controller's responsibility resumes only after 'The flight crew informs the controller that the TCAS manoeuvre has been completed'. Later, B737(A) was routed towards TALLA. Meanwhile, the Radar 2 Controller transmitted to B737(B) *"if you can expedite your climb please there's Seven er Five Seven just climbing out beneath you"*. [Actually a B737]. The pilot replied *"expediting climb"*. At 1518:40, B737(B) reported, *"we've just had a TCAS RA off that contact"* which was acknowledged, *"That's understood"*. Thirty seconds later, the flight was instructed *"turn own navigation to the November Tango report established in the hold"*. Once again, although the two ac were now on deconflicting flight paths, this heading was issued before the pilot confirmed that the TCAS manoeuvre had been completed. Additionally, the phrase 'avoiding action' was again not used, on this occasion by Radar 2 Controller. For an unexplained reason, STCA did not activate during the incident.

Since this Airprox, additional training has taken place to ensure that controllers at the Unit use the term 'avoiding action' when appropriate. Additionally, local ATC procedures have been changed i.e. go-around flights will always be transferred initially to the Radar 1 Controller and then further co-ordination will take place, as necessary, with the Radar 2 Controller.

UKAB Note (1): The recording of the Great Dun Fell radar shows the incident clearly. B737(A) can be seen turning left after the go-around and climbing. Meanwhile B737(B) crosses from its 1 o' clock through its 12 o'clock at 0.6nm and climbing through its level. When B737(B) is in (A)'s 1230 at 1nm the ac are co-alt at FL038 with (B) climbing in response to the TCAS RA and (A) peaking at FL038 while changing from a climb to a TCAS descent.

UKAB Note (2): The Newcastle METARs were as follows:

1450Z 21/03/08 EGNT 211450Z 35026KT 9999 VCSH FEW015 SCT020CB 04/01 Q0990
1520Z 21/03/08 EGNT 211520Z 35031G42KT 9999 VCSH FEW012CB SCT020 04/M00 Q0990

## PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members noted that this incident had taken place in difficult, rapidly changing and thoroughly unpleasant weather conditions. While it is easy to analyse an incident with the benefit of recordings, hindsight and in the relative calm of a boardroom, all the participants in this incident had been in a very difficult situation.

It seemed to experienced controller Members that the Radar Controllers had allowed the difficult situation to lead to several lapses in procedure and phraseology that resulted in the pilots of the 2 ac having to avoid each other by their correct reaction to their respective TCAS RA warnings rather than any built-in separation provided by ATC. One radar controller Member considered the situation as to 'who owned' the airspace to be unclear. Simply having arriving ac being controlled by one controller and departing ac, in this case following a second missed approach, by the other controller had not worked in this, arguably not uncommon, situation. However, it was clear both to pilot and controller Members that, following the second missed approach, B737(A) should have been instructed by Radar 1 to route iaw the mandatory 'Noise Preferential Routeings' for RW07 in the UKAIP which require ac departing to the N, as was the case in this situation, to climb straight ahead to 3nm DME from the I-NC before commencing a left turn onto track. Had this been complied with, both ac would have followed similar ground tracks and therefore no conflict would have ensued despite the ac being controlled by different controllers. Since B737(A) had been instructed to turn left on track to TLA just after the go-around and while over the airfield, this had brought its ground track into conflict with that being flown by B737(B) and caused both ac to receive TCAS RAs.

That being the case, the Board determined that the Radar 1 controller had, for whatever reason, vectored B737(A) into conflict with B737(B) of whose presence he was aware (since it was displayed on his radar) but had overlooked.

Despite that there may have appeared to have been a compromise of normally accepted safety standards in that one of the safety nets had failed, the Board determined that since both pilots had reacted correctly to their respective TCAS warnings, this had removed any risk that the ac would have collided.

The Board noted the post incident remedial action taken by Newcastle ATC.

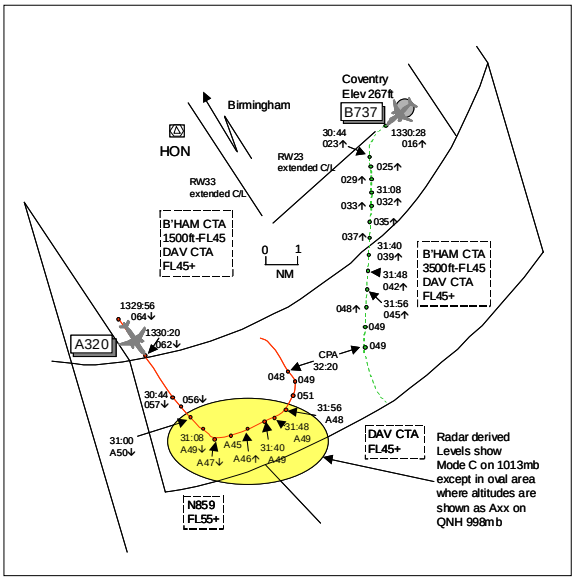
## PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Newcastle RADAR 1 controller vectored B737(A) into conflict with B737(B).

Degree of Risk: C.

# AIRPROX REPORT NO 032/08

| | | |
|---|---|---|
| *Date/Time:* | 26 Mar 1332 | |
| *Position:* | 5214N 00132W (15nm SE Birmingham) | |
| *Airspace:* | B'HAM/DAV CTA | (Class: D/A) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | B737-500 | A320 |
| *Operator:* | CAT | CAT |
| *Alt/FL:* | FL45↑ | 4700ft↓ (QNH 998mb) |
| *Weather Visibility:* | IMC IICL | IMC KLWD |
| *Reported Separation:* | Nil V/2·5nm H | 200ft V/3nm H |
| *Recorded Separation:* | 100ft V/2·4nm H | |




## PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

**THE B737 PILOT** reports outbound from Coventry IFR and in receipt of a RCS from Birmingham squawking with Mode C. During the departure phase from RW23, following a CPT23T SID, they noticed heavy rain showing on the Wx radar on their intended routeing so they asked Coventry Radar if they could maintain a heading of 190° to fly W of the Wx. This was approved and they were then handed over to Birmingham. They noticed TCAS traffic to the SW descending towards them and on first contact with Birmingham passing FL45 at 180kt they were told to maintain level, which they did. They then heard the Birmingham controller give avoiding action to another flight before they were given an avoiding action L turn onto 110° into the heavy rain that they had been avoiding. TCAS gave a single TA and separation was noted to be about 2·5nm on the TCAS display with the other traffic flying clear of them to the NW. They were then handed over to London who cleared them for further climb. He assessed the risk as medium.

**THE A320 PILOT** reports inbound to Birmingham IFR and in receipt of a RCS from Birmingham squawking with Modes C and S. Following a GROVE 1C arrival via HON, they had asked for Wx-avoidance headings. During the downwind leg for RW33 they were informed that they would be extended downwind in order to accommodate a Coventry departure. The flight was turned onto base leg with one stage of flap and an IAS of 180kt before ATC then told them to descend from FL60 to 4000ft on QNH 998mb; altimeter sub-scales were changed and a descent was initiated. On passing approximately 4700ft they were told to level at FL50 and to make an immediate L turn onto 310° almost simultaneously with TCAS annunciating 'traffic, traffic'. The conflicting ac was showing on the Navigation Display (ND) in approximately their 3 o'clock position range 3nm and 200ft below. They heard avoiding action also being given to a B737. Throughout this situation they were in IMC so were unable to visually acquire the other ac despite there being 3 pilots on the flightdeck. Workload had increased to high, having been given a clearance to stop at a FL rather than an altitude, and the ac was flown expeditiously onto the given heading and to the issued FL before resuming normal radar vectors for the approach onto RW33. He assessed the risk as low.

**THE BIRMINGHAM RADAR 2 CONTROLLER** reports vectoring the A320 inbound for an ILS approach to RW33 whilst a B737 was due to depart from RW23 at Coventry on a 'SID'. The Coventry controller called and asked for a release on the B737 which was approved on a CPT 23T departure up to FL50. He told the A320 crew that he would be extending their flight downwind to facilitate the B737 and then told the flight to descend to altitude 4000ft. Assessing that it was likely the ac would leave CAS, he then told the crew to stop descent at FL50 but owing to the low pressure of 998mb, he realised that the ac may have already passed that level. He saw the B737 departure and turned the A320 onto base leg for RW33. The Coventry controller called to advise him of the B737's departure time and that the flight was avoiding Wx on a heading of 190° so he asked the other controller to transfer the B737 flight to his frequency 131·0MHz. The B737 crew called advising of Wx avoidance and he told them to stop climb immediately and then gave avoiding action turns to both the subject flights as by then STCA had

activated. These turns deconflicted the 2 ac and he continued to vector the A320 for the ILS and transfer the B737 to London, believing that separation had not been lost during this incident.

**THE BIRMINGHAM RADAR 1 CONTROLLER** reports handling a busy spell of inbound traffic. Coventry passed a taxi check on the subject B737 outbound on a CPT23T departure route. The Birmingham Radar 2 was handling a sequence of traffic inbound to RW33 so, in accordance with procedures he (the Radar 1) passed the fps on the B737 to the Radar 2 for him to release it. Several inbound flights had been requesting headings to avoid Wx, one of which was the subject A320 flight which requested a heading of 280° then 290°. He wrote these headings on the A320 fps and transferred the flight to Radar 2. He had earlier drawn Radar 2's attention to an area of Wx between 10nm final to RW33 and Coventry airport which seemed to be what the inbound flights were trying to avoid. He was still busy with his own traffic when he observed an STCA alert activate between the A320 and the B737 and heard Radar 2 give avoiding action to both flights.

**THE COVENTRY APP/APR** reports the B737 was released by Birmingham to FL50 on a CPT23T. On initial contact, the crew reported turning onto heading 190° due Wx. He immediately contacted Birmingham and informed them of the deviation, the controller instructing him to transfer the flight to Birmingham on 131·0MHz, which he did promptly. Later that day, the B737 crew called asking whether Birmingham were filing paperwork on the loss of separation that they had on the departure but Coventry ATC were unaware of any incident. Further enquiries revealed that reporting action had been taken as apparently the B737 had deviated from the 'SID' towards a Birmingham inbound ac.

**ATSI** reports that at the time of the Airprox, both flights were in communication with the Birmingham Approach Radar 2 controller who described his workload as moderate whilst the traffic loading was light.

The A320 flight established contact with the Birmingham Radar 2 controller at 1325:00 when the ac was approximately 19nm SE of Birmingham Airport maintaining FL80, and the crew was instructed to report clear of weather. At 1326:15, the crew reported that they were now able to accept vectors for the ILS. The controller instructed them to turn L 10° and report their new heading which was 270°. The A320 was about to cross through the final approach to RW33 at a range of 7nm and the controller instructed the crew to descend to FL60. This was acknowledged and then an instruction to turn L heading 210° was issued.

At this time, a call from Coventry was received requesting a release on the B737, which had been cleared to follow a CPT23T standard departure (*ATSI Note: This is a trial for the subject airline's B737 ac only and requires the ac to: Climb straight ahead to 770ft QNH before turning left to track 150º (M) to establish on the WCO NDB QDM 148° and intercept the CPT 355 radial to CPT*) climbing to FL50. This was approved and the controller instructed Coventry to transfer the B737 flight direct to the relevant TC Midlands frequency. The A320 flight was then instructed to turn L heading 150° to position the ac late downwind LH for RW33. The controller informed the crew that he would have to extend the routeing slightly due to the imminent departure from Coventry. At 1329:55, the controller instructed the crew of the A320 to descend to 4000ft, passing the QNH of 998mb. The A320 was now crossing through the extended C/L of Coventry's RW23 at a range of 10·6nm and passing FL64.

Just after 1330:40 the controller instructed the A320 to turn L heading 060°. As the crew acknowledged this the phone rang and the Coventry Radar controller called to advise that the B737 had turned onto a heading of 190° to avoid weather. The Birmingham controller responded by saying that the B737 must be transferred to his frequency, rather than the initial plan of straight to TC. He then (at 1331:10) instructed the A320 crew to stop their descent at FL50; the Mode C was already indicating 4900ft however. At this time, the B737 was in the 8 o'clock position of the A320 at a range of 8·6nm and indicating FL032 (2750ft QNH 998mb) climbing. The Birmingham controller instructed the A320 crew to turn L heading 360° and to report established on the LLZ. Shortly afterwards, at 1331:35, the controller instructed the A320 to turn L heading 330°. The B737 was now NE of the A320 at a range of 6·1nm and passing FL039 (3450ft QNH) tracking 190°, while the A320 was turning L, indicating 4900ft. The B737 crew then called the Birmingham controller (1331:45) and reported heading 190° and climbing to FL50. They were instructed to stop their climb and this was followed by avoiding action to both crews, the A320 being instructed to turn L heading 310° and the B737 to turn L heading 110°. Minimum separation occurred at 1332:20 when the ac passed starboard-to-starboard range 2·4nm, the B737 100ft above the level of the A320.

Later, the Birmingham controller reported that adverse weather had been present earlier during the shift. Generally, traffic inbound to HON had been requesting to route either N or S of Coventry in order to avoid the build-ups. When the A320 flight called, his plan was to follow the standard routeing, vectoring it over HON or as close

to it as possible, and then give it descent. The ac would then be vectored for a LH cct to the ILS for RW33. The controller had a fps on the B737 so he knew that its departure was expected. The standard procedure used to integrate such flights is to descend the Birmingham inbound to FL60 and release the Coventry departure climbing to FL50. This ensures vertical separation until such time as either lateral separation exists or the ac are no longer in potential conflict.

The Birmingham controller was fully aware of the imminent departure of the B737 as he advised the crew of the A320, at 1329:05, "*Just be having to extend you downwind slightly due to a Coventry departure*". At this time the A320 was 8·6nm S of Birmingham Airport, passing FL72 for FL60 and turning downwind. The B737 had been released and it was not until the ac was airborne that the crew requested a turn onto 190° to avoid weather. The Coventry ADC transferred the ac to Coventry Radar who approved the turn and instructed the crew to report passing FL40. Coventry Radar then informed Birmingham Radar what the B737 was doing and, accordingly, Birmingham Radar requested that the ac be transferred to his frequency rather than to TC. However, having already descended the A320 below FL60 the 'built-in separation' was no longer assured and so he requested that the crew stop their descent at FL50.

He advised that he had seen the B737 appear on his radar about 1nm SW of Coventry and once the airborne time had been received, he moved the strip on the B737 to directly underneath that of the A320. He believed that there was no weather S of Coventry and so did not expect the B737 to deviate from the normal departure track. Current procedures require that a minimum of 5nm lateral separation is maintained between Coventry departures and Birmingham traffic, unless vertical separation exists, but this can be reduced to 3nm if both ac are identified and working either the Birmingham Radar 1 or Radar 2 controllers. It was confirmed that unit 'best practice' was to ensure that vertical separation is maintained until it has been positively established that the Coventry departure has turned and is tracking away from the RW33 final approach area. On this occasion the Birmingham controller had descended an ac below FL60 and although he had instructed its crew to stop their descent at FL50, vertical separation would not exist. He instructed the A320 crew to turn L heading 360° to establish on the LLZ, still planning to turn the B737 flight - once it called - and thereby maintain lateral separation. At the time this instruction was given, the two ac were 7·6nm apart: however, the crew of the B737 had not yet called on his frequency. He realised that both lateral and vertical separation were continuing to reduce and so he instructed the crew of the A320 to turn L heading 330° in an attempt to increase lateral separation.

When the crew of the B737 called (1331:45), the ac were only 5·5nm apart and converging, with the B737 passing FL42 (3750ft QNH 998mb) climbing and the A320 at altitude 4900ft. He instructed the B737 crew to stop their climb and then issued avoiding action instructions. He advised this was his priority rather than passing any TI. As the crew made their initial call, in the background can be heard the automated words 'Traffic Traffic' from their TCAS. The avoiding action turns took the 2 ac away from each other but not before separation reduced to 2·4nm and 100ft.

## 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 Radar 2 had descended the A320 below FL60 and continued vectoring it towards the RW33 ILS when he was fully cognisant of the impending B737 departure from Coventry. Having turned the A320 onto a L base heading of 060°, Radar 2 was then made aware by Coventry APR that the B737 was on heading 190° for Wx avoidance. Although this did not fit in with the expected plan, the onus was always on the Radar 2 to ensure vertical separation was maintained until he was sure that the Coventry departure had turned L and was tracking clear of the RW33 extended C/L. Members agreed that the Radar 2 could have effected an early resolution by instructing the Coventry APR to stop the B737's climb before it was transferred to his frequency: however, he waited until the B737 flight first called before so doing. Meanwhile, he had stopped the descent of the A320 at FL50, which had caused the crew some concern as they had set the QNH on the altimeter subscales and been cleared to 4000ft so they had to reset their altimeter settings and then adjust their flight profile. Thereafter, the Radar 2 was attempting to separate the subject ac laterally as vertical separation would not be achieved. This led Members to agree that the cause of this Airprox was that the Birmingham Radar 2 descended the A320 into conflict with the B737 which was departing Coventry.

Turning to risk, the B737 crew had seen the A320 approaching on TCAS and on initial contact with the Birmingham Radar 2 had levelled-off, when told to, before then complying with the avoiding action L turn. The A320 crew had also levelled-off and had been given a L turn towards the LLZ prior to a further L turn away from the B737, albeit before receiving an avoiding action instruction. Both crews reported receiving TA alerts approaching the CPA. The radar recording shows the A320 flight turning L just after the B737 crew made their initial call to the Radar 2 which had very quickly resolved the potential confliction. These actions when combined allowed the Board to conclude that any risk of collision had been quickly and effectively removed.

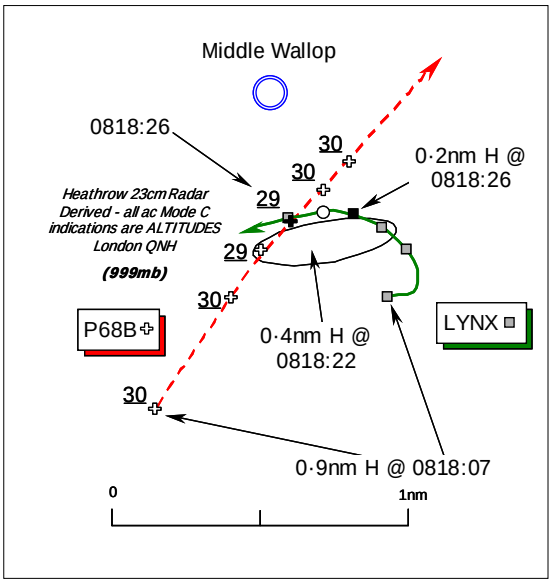
## PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Birmingham Radar 2 descended the A320 into conflict with the B737 which was departing Coventry.

Degree of Risk: C.

# AIRPROX REPORT NO 033/08

| | | |
|---|---|---|
| *Date/Time:* | 27 Mar 0818 | |
| *Position:* | 5108N 00133 W (Middle Wallop - elev 288ft) | |
| *Airspace:* | Middle Wallop MATZ(Class: G) | |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | Lynx Mk7 | P68B |
| *Operator:* | HQ DAAvn | Civ Comm |
| *Alt/FL:* | 2400ft↑ | 3000ft |
| | QFE (989mb) | RPS (996mb) |
| *Weather* | VMC NR | VMC NR |
| *Visibility:* | 30km | >10km |
| *Reported Separation:* | | |
| | 100ft V/Nil H | 300ft V/50m H |
| *Recorded Separation:* | | |
| | Not recorded | |




## PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

**THE LYNX MK7 HELICOPTER PILOT** reports that he was a member of the Lynx Helicopter Display Team conducting an individual display practice at Middle Wallop aerodrome. Operating VFR in VMC, he was in communication with Middle Wallop TOWER on 118·275MHz whilst in receipt of a FIS.

Part of the practice routine necessitated a climb to 2500ft QFE (989mb) prior to executing a barrel roll. Clearance was received from Middle Wallop TOWER for the manoeuvre and the climb commenced, heading 300°(M) at 80kt. During the climb, TOWER reported a fixed-wing ac crossing above the aerodrome from SW to NE at 3500ft. As they looked to identify the reported traffic, a white high wing ac – the Partenavia P68B - was spotted about 100m away in their 10 o'clock less than 100ft above his helicopter. At this point they were at a height of 2400ft QFE and about to level off. The PF initiated an immediate descent to avoid the other ac but only managed to reduce their rate of climb enough to allow the fixed wing ac to pass directly overhead with a *"very high"* risk of a collision. As a result of the conflict the display practice was terminated and an Airprox reported to TOWER on RT.

He stressed that the cockpit workload was high whilst repositioning during the display practice and added that his Lynx helicopter has a grey/green camouflage scheme but the white HISLs were all on.

**THE PARTENAVIA P68B PILOT-IN-COMMAND (P-I-C)** reports that he was the PNF occupying the LHS with another commercial pilot as the PF in the RHS. They had departed from Bournemouth Hurn on an IFR flight at 3000ft Portland RPS flying in VMC. Bournemouth had attempted to contact Boscombe Down ATC to arrange a handover but they were unable to do so. Therefore, they were handed over to Brize RADAR [RADAR] tracking towards COMPTON (CPT) VOR heading 030° at 140kt under a RIS. The assigned squawk was selected with Mode C; neither Mode S nor TCAS is fitted. As they approached CPT VOR, Brize RADAR informed them that a helicopter pilot at Middle Wallop had filed an Airprox although nothing had been seen by the controller on his radar. However, they had seen a helicopter pass 300ft below their ac heading in the opposite direction about 50m down on their starboard side when they were in a level cruise in the vicinity of Middle Wallop. He added that no avoiding action was taken following the "late sighting" but there was no threat and he assessed the Risk as *"low".*

His ac has a blue and white colour scheme and the HISLs were on.

**THE PARTENAVIA P68B CO-PILOT** helpfully provided a supplementary account. He reports that he was the PF and handling the RT with Brize RADAR at the time of the Airprox. Flying at an altitude of 3000ft over Middle Wallop, he observed a helicopter in his 2 o'clock about 150yd away closing towards his ac some 3-400ft below in a 30° aob turn, which finally passed just astern and headed away. The sighting was too late to take any action; however, in his view there was "little or no threat" and the traffic called to the P-I-C as such – "helo – no threat".

## AIRPROX REPORT No 033/08

**THE MIDDLE WALLOP TOWER CONTROLLER (TWR)** reports that the Lynx pilot was carrying out a display practice overhead the airfield and requested a climb in the overhead to 2500ft QFE (989mb). As the Lynx was climbing, he observed on the VCR Radar Display [akin to an Aerodrome Traffic Monitor] that there was an ac approx 2-3nm SW of the aerodrome heading NE, indicating 3500ft Mode C (1013mb). The aircraft – the P68B - was then sighted visually and as its track would take it through the overhead, traffic information was passed to the Lynx crew. Shortly afterwards the pilot of the Lynx stated that he had passed about 100ft beneath the other ac and would be filing an Airprox. The other aircraft was identified as a P68B squawking A3711, working Brize RADAR under a RIS at 3000ft Portland RPS. Brize RADAR had not informed Middle Wallop ATC of its transit through the MATZ.

**THE BRIZE RADAR CONTROLLER (RADAR)** reports that at about 0820 the P68B was handed-over by Bournemouth APPROACH who stated they were handing it to BRIZE RADAR because Boscombe Down was closed. When the P68B pilot called he requested a RIS which was provided, but 'limited' because of the ac's proximity to the base of coverage of the Brize Watchman ASR and the Cotswold RPS (996mb) was issued When the P68B was about 3nm NE of Middle Wallop, after having flown through the Middle Wallop overhead, he received a call from Middle Wallop ATC informing him that the P68B had come close to a helicopter doing aerobatics and that an Airprox would be filed. At no time did any radar returns, primary or secondary, appear in the Middle Wallop area. The P68B pilot did not report seeing any traffic as he transited the Middle Wallop overhead, but when he was informed about the Airprox he stated, "yes, I was good VMC I was visual with the helicopter and didn't consider them a threat". The pilot requested the Middle Wallop ATC telephone number and stated he would contact them on arrival at his destination.

**THE BRIZE RADAR SUPERVISOR** reports that at the time of the Airprox the weather was good -Brize Norton was CC WHITE and the Brize RADAR controller was operating under a light traffic loading.

As Boscombe Down were closed, the crew of the P68B was in receipt of a Limited RIS (due to range) on the Brize LARS frequency. The RADAR controller informed him that after the P68B had passed through the Middle Wallop overhead at 3000ft RPS (996mb) Middle Wallop TOWER telephoned to say the pilot of a helicopter conducting a practice display in his overhead considered the P68B came too close and that they were reporting an Airprox.

The LARS controller advised him that the P68B crew reported seeing the helicopter and considered there was no confliction but at no time did any radar contacts paint on the Brize Watchman/SSR in the vicinity of Middle Wallop.

**ATSI** reports that the Partenavia P68B crew departed Bournemouth Hurn and were provided with a RIS outside CAS. According to the Unit report, the controller informed the P68 crew that Boscombe Down was closed so at 0814, he telephoned Brize ATC and passed details of the flight. At 0814:32, the crew were transferred to Brize RADAR at 3000ft PORTLAND RPS (997mb) under a RIS with a squawk of A3711.

Meanwhile, at Middle Wallop, the Lynx crew had called for start up just before 0801. The TOWER controller advised the crew that the RW in use was 27RHC and the QFE 989mb. The crew simply responded "*That's all copied* [Lynx C/S]" and the controller did not request a read back as is required. At 0810:50, the Lynx was cleared to commence its display and at 0817:15, the Lynx crew advised that they would be climbing to 2500ft for the next 10 minutes, which was acknowledged. The controller noted an overflying ac on his VCR Radar Display and at 0818:12, transmitted "[Lynx C/S] *just to advise you there's a light aircraft routeing through the overhead southwest to northeast at 3 thousand 5 hundred feet*". (ATSI Note: The radar display in the VCR uses the SAS of 1013mb as a datum unless a QFE or QNH has been entered by Approach Control. At the time of this Airprox, Approach was not yet open and so the default would have been 1013mb thus displaying the PN68's level as approximately FL35). The crew acknowledged this before the controller added "*Coming into the overhead now*". After a brief pause the crew transmitted "*Er TOWER he was more like 2 thousand 5 hundred feet we missed him by about 1 hundred feet*".

Shortly afterwards the crew advised that they intended to file an Airprox and so a telephone call was made to Brize RADAR to ascertain the details of the other ac. Brize RADAR advised that the P68B was at 3000ft (996mb) and in receipt of a RIS.

Subsequent to this Airprox the Flying Wing Training Officer has instructed that a NOTAM be issued stating that Display Practice is taking place outside the confines of the ATZ during specified times. Furthermore, SATCO Middle Wallop has recommended to the Squadron Commander that Display Practice ac should squawk A7004

(Aerobatic Conspicuity code). At the time of the Airprox the Lynx Mk 7 ac based at Middle Wallop were not fitted with Mode 3/A and C.

UKAB Note (1): The UK AIP at ENR 2-2-2-3 notifies the Middle Wallop ATZ as active H24, radius 2nm centred on 51°08'22"N 001°34'07"W, extending from the surface to 2000ft above this Government Aerodrome's elevation of 297ft amsl. Upper limit – 2297ft amsl.

UKAB Note (2): The UK AIP at ENR 2-2-2-1 notifies the Middle Wallop MATZ as a radius of 5nm centred on the same origin as at Note (1), with a stub of 3nm (2nm either side of centre-line) aligned on 256°(T) to the a/d. This airspace being subsumed within and concomitant with the Boscombe Down Combined MATZ (CMATZ), with Boscombe Down being the 'Controlling Aerodrome' when open, the upper limit of 3407ft amsl is determined as 3000ft above Boscombe Down's elevation of 407ft amsl throughout the CMATZ. Importantly, ENR 2-2-3-1 para 1.6 (the respective entry in the Mil AIP is virtually identical) states that:

*A MATZ is operative when the aerodrome concerned, or in the case of a CMATZ, any one of the aerodromes, is open. Normally, the Controlling Aerodrome ATC Unit for a CMATZ is to remain open while any one of the aerodromes in the CMATZ is open for flying. Alternatively, the Controlling Aerodrome is to delegate overall responsibility to the aerodrome remaining open, including arrangements for operating the CMATZ frequency.*

Additionally, ENR 2-2-3-2 para 3.1 specifies that: *A MATZ Penetration Service will be available during the published hours of watch of the respective ATS Units*, and at para 4.1 Note 9 that when:

*Boscombe Down is closed but Middle Wallop remains open, a CMATZ penetration service will be provide by Wallop APPROACH on 126·7MHz.* (The promulgated CMATZ penetration ICF)

UKAB Note (3): The RAF FLIP En-route Supplement (ERS-BINA) gives the published times of operation for Middle Wallop as: 0800-1700 or SS+15, Mon – Fri, and for Boscombe Down *HO* - service available to meet operational requirements.

UKAB Note (4): Analysis of the Heathrow 23cm Radar recording shows the P68B, after departing Bournemouth, tracking NE. The squawk changes from A7352 to A3711 at 0816:25 and the Mode C indicates that the ac was level at 3000ft London QNH (999mb) with occasional fluctuations to 2900ft QNH. The P68B is shown above the ATZ - but broadly 400ft below the upper limit of the CMATZ at 3407ft amsl and thus within the CMATZ - approaching Middle Wallop some 1·2nm SSW of the aerodrome, just as a primary contact commensurate with the Lynx helicopter appears for the first time at 0818:07. The Lynx turns L about from an easterly heading as the P68B maintains its course. At 0818:26 the P68B indicates 2900ft verified Mode C (999mb) as the Lynx turns through W about 0·2nm away – about 400yd. On the next sweep radar contact on the Lynx is lost – probably just as the ac pass one another - as the helicopter flies to the S of the P68B, just off its starboard quarter, and draws astern as the latter regains 3000ft London QNH (999mb). The P68B then opens to the NE on a steady course, passing 1/3nm SE abeam Middle Wallop aerodrome. Primary radar contact is regained on the helicopter at the next sweep but is lost thereafter. By interpolation, it would seem that the minimum horizontal separation was broadly of the order of 150yd at the CPA, but the absence of Mode C from the Lynx does not allow the vertical separation to be ascertained. An altitude of 2900ft London QNH (999mb) would equate to a height of about 2600ft Middle Wallop QFE (989mb) [-300ft], suggesting vertical separation was not less than 200ft above the Lynx pilot's reported height of 2400ft QFE.

**MIL ACC** reports that the Partenavia P68B was flying from Bournemouth to Cranwell under IFR via the CPT VOR at 3000ft Portland RPS (996mb), having been handed over by Bournemouth APPROACH who advised that Boscombe Down was closed. The P68B pilot first made contact with Brize Norton RADAR on 124·275MHz at 0816:47 and was placed under a RIS by RADAR at 0817:10 "…*Identified Radar Information Service Cotswold QNH 9-9-6"*. RADAR then transmitted at 0817:16, "..*limited traffic information from all around as you're at the base of radar cover at the moment".* The weather at Middle Wallop was reported as FEW cloud at 6000ft and a visibility of 20km, QFE 989mb. RADAR was unaware of the Airprox until advised by the Middle Wallop TOWER Controller via land-line and reported that "at no time did any radar returns primary or secondary, appear in the Middle Wallop area".

RADAR informed the P68B crew at 0824:15, that "..*I've just had a phone call from the..Air Traffic Controllers at Middle Wallop..nothing was seen on radar but apparently as you passed through their overhead you got quite*

*close to their..helicopter display team..and they're filing an Airprox on the incident".* The P68B pilot replied at 0824:48, "*There's no problem we were actual Victor Mike Charlie and we had visual so there was no threat".*

After the incident a NOTAM was issued by Middle Wallop advising that high-energy manoeuvres would take place within the Middle Wallop MATZ surface to 3000ft agl 0630 to 0800 and 1530 to 1730.

Boscombe Down and Middle Wallop are protected by a Combined MATZ (CMATZ); JSP 552 201.130.4 states that a MATZ is operative when the aerodrome concerned, or in case of a CMATZ, any one of the aerodromes, is open.

The diligence shown by Middle Wallop TOWER in passing traffic information averted a more serious incident developing. However, RADAR did not attempt to confirm the activity state at either Middle Wallop or Boscombe Down after accepting the handover from Bournemouth APP. Had RADAR been aware that Middle Wallop were open despite Boscombe Down being closed, traffic information may have been passed to Middle Wallop and the incident may have been avoided.

Middle Wallop is addressing the requirement to use NOTAMs to advise the wider aviation community of any unusual air activity operating within the vicinity of Middle Wallop, together with the status of the CMATZ when the controlling authority, Boscombe Down, is closed.

It should be noted that the Heathrow Radar recording was derived from a different radar source than that used by the RADAR Controller, who met the requirements of JSP552 in providing a RIS that was correctly limited due to the flights proximity to the base of radar coverage.

**HQ AAC** comments that UKAB Notes (2) & (3) above clearly state the dimensions and operating times of the CMATZ. Whilst not legally required to ensure CMATZ penetration clearance has been obtained, the crew of the P68B should have been aware of the presence of the CMATZ in relation to their track, it would have been better airmanship to ensure CMATZ penetration clearance had been obtained.

It is possible that both Bournemouth APPROACH and BRIZE RADAR – in light of their knowledge of the location of Middle Wallop and the low RPS value – could have assisted in avoiding this incident.

Whilst prompt action by the Middle Wallop controller helped avert a more serious incident, immediate awareness of the level of the P68B would have been achieved if the VCR Radar display datum had been set to QFE. Perhaps a worthwhile practice to help to de-conflict MATZ traffic with transiting traffic in the absence of an Approach controller.

The use of NOTAMS to give notice of unusual aerial activity is essential, especially when the activity extends beyond the sanctity of the ATZ. Display practices rarely exceed 1500ft on the QFE. It is not clear whether the Lynx crew had pre-briefed ATC on their intention to operate up to 2500ft QFE, but deciding to do so exposed themselves to the increased risk of collision by conducting high workload manoeuvres outside the ATZ.

## PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It was evident to the Board that there were several interesting aspects that had contributed to this Airprox and several salutary lessons for pilots and controllers alike, most of which were not new but worth repeating here.

From the Lynx pilot's perspective he reported that he had received a *clearance* from Middle Wallop TWR for the manoeuvre he was about to practice and had commenced his prenotified climb to 2500ft QFE, heading 300°(M), when TOWER reported the fixed-wing ac crossing above the aerodrome at 3500ft. It was only then that the crew spotted the Partenavia P68B less than 100ft above their helicopter. Whilst clearly a military pilot must communicate with ATC and obtain a clearance to operate in the MATZ, especially when conducting unusual manoeuvres such as here (instructions from ATC to military pilots within a MATZ are mandatory), that is not the case for their civilian counterparts who only require permission to enter the ATZ (extending here to 2297ft amsl). Military pilots should therefore always bear in mind that other ac, of which ATC has no knowledge, might be

encountered in a MATZ. The Board was well aware of the status of a MATZ – here a CMATZ (extending to 3407ft amsl) - and it was clear that the Lynx crew had exited the Middle Wallop ATZ, into the airspace clearly promulgated as the CMATZ where there is a somewhat lesser degree of protection afforded to aerodrome traffic and where 'see and avoid' prevails. Such protection as there is relies on a civilian pilot's voluntary compliance with MATZ Penetration procedures, as promulgated in the UK AIP and which the Board encouraged all pilots to observe, which when followed will enhance their own situational awareness and improve the overall level of safety for all aviators in this airspace.

The Army helicopter pilot Member explained that this was the first occasion that the pilots flying this Lynx had practised a Barrel Roll manoeuvre. This created a high workload on their part, necessitating significant 'heads-in the cockpit' time, 'tweaking' the ac's computers to ensure that the manoeuvre could be accomplished safely within the ac's limits. He suggested that there was probably an element of surprise on their part when they first encountered the P68 aeroplane, about 100m away in their 10 o'clock following the Middle Wallop TWR controller's warning. This traffic information probably saved the day insofar as it got the Lynx crew eyes 'out of the cockpit' looking for the other ac. The aim of traffic information is to assist the crew with the fullest information practicable in the circumstances and here the alert Middle Wallop controller had evidently provided a salutary warning at a critical moment. However, it was clear from the ATSI account that the mention of 3500ft was somewhat misleading and although TWR's prompt warning was helpful, it was not accurate. The ATSI investigation had revealed that no QNH conversion was set into the VCR Radar Display. Consequently, any Mode C indications on that Display were related to a datum of 1013mb and as such were Mode C indicated flight levels, not altitudes or height. However, the Lynx crew having advised they would be operating up to 2500ft (QFE), any mention of traffic at 3500ft without a comment that this was based on the SAS would plainly have suggested to them that their helicopter would still be 1000ft below the reported ac, which clearly was not the case here. At Middle Wallop, the respective pressure is normally set in the radar display by the ZONE controller but it is not uncommon for ATSUs to leave the SAS set to remove the possibility for any momentary confusion over whether levels, heights or altitudes were indicated on their display. However, this then places an onus on the controller to either convert the indicated level to a height on QFE or an altitude on QNH, depending on which barometric reference the pilot is flying to at the time. Here in a MATZ where QFE is normally utilised it would be common practise to pass traffic information about transit ac crossing the MATZ as a height related to the appropriate QFE. Controller Members agreed that the Command's view on this point was entirely germane and were keen to stress that if TWR had reported the P68's height accurately, more meaningful and accurate traffic information would have resulted which might even have forestalled this close quarters situation. From the radar recording it had been shown that the P68 was indicating an altitude of 2900ft [London QNH (999mb) – the recording's datum]. This equated to a height of about 2600ft Middle Wallop QFE (989mb), suggesting that the P68 was about 200ft above the Lynx pilot's reported height of 2400ft QFE when the latter levelled his helicopter – a close call. But as TWR had no knowledge of the CMATZ penetration beforehand the controller merely related what he saw. Some Members considered this to be a late sighting on the part of the helicopter crew but as they had been eastbound with the P68 astern of the helicopter until the latter turned NW'ly and started to climb - which was when the traffic information was passed - the Lynx pilots probably spotted the P68 as soon as circumstances permitted, initiating an immediate descent to avoid the aeroplane.

The helicopter pilot's Command had also highlighted that a NOTAM would have been appropriate to broadcast to other aviators beforehand that a display practise was taking place here. The Board was reassured that this sensible precaution has now been reinforced at Middle Wallop, for if the P68 pilots had been aware of this unusual aerial activity it might have caused them to be more circumspect over the nature of the airspace within which they had intended to fly at their planned transit altitude. Notwithstanding the lack of a NOTAM in this instance, it seemed to pilot Members that this Airprox had its origins at the flight planning stage, a GA pilot Member cautioning against planning an IFR flight at 3000ft amsl through this airspace which in his view was unwise. A transit at this altitude on this track would inevitably result in penetration of the CMATZ, which could potentially conflict with aerodrome traffic. It would have been wiser to have planned either to have flown around the CMATZ or obtain approval to penetrate it, given that the CMATZ was indeed active on this Thursday morning in accordance with the promulgated hours of watch of ATC.

This Airprox was a valuable lesson both to pilots and controllers of the pitfalls that can be encountered when assumptions are made on the basis of limited information. Here the Brize RADAR controller had reported that when the P68 was handed to him, Bournemouth ATC had advised that Boscombe Down was closed. The ATSI report had also made it plain that Bournemouth had informed the P68 crew that Boscombe Down ATC was closed and so telephoned Brize ATC and handed over the flight for a LARS. However, the ATSI Advisor commented that

no calls had been made to Middle Wallop on the direct line that exists between the two ATSUs so it seems that an erroneous assumption was made that Middle Wallop would not be open when the CMATZ controlling authority (Boscombe Down ATC) was closed. This ignored the basic premise laid out unmistakably in the AIP that a CMATZ is operative when any one of the aerodromes is open and it would have been a simple matter for the controller to check this out. It seemed to controller Members that the Brize RADAR controller had made an incorrect supposition, perhaps understandable to some, also as a result of the comment made by Bournemouth. However, it was clear that Brize RADAR had not taken into account that Middle Wallop was open within its published hours or that the CMATZ was active. Controller Members believed that as a military controller, arguably more familiar with the operation of a MATZ, the Brize RADAR controller should have understood this. There was clear potential for an ac transiting through this airspace at an altitude of 3000ft to conflict with Middle Wallop aerodrome traffic and so it was inappropriate for the controller to allow the IFR P68 to transit through the CMATZ unannounced or under a radar service without questioning this aspect. However, civilian controller Members pointed out that with the helicopter operating at a maximum altitude of about 2788ft, the Lynx was in all probability below Brize RADAR's coverage and he had correctly limited the radar service because of this. Moreover, the Lynx had no SSR fitted and the probability of detecting a small primary contact carrying out high-energy manoeuvres some 37nm away from Brize Norton was fairly remote. Therefore, controller Members understood entirely why the Brize RADAR controller reported that no radar contacts were observed, thus no traffic information would have been forthcoming to the P68 crew. Nevertheless, controller Members opined that the P68 was apparently displayed to the Brize RADAR controller so the position and track of this P68 was known to him. He could have called Middle Wallop and co-ordinated the transit or suggested to the P68 crew to either route around or climb above the CMATZ airspace, within which Brize RADAR had no mandate to provide a LARS. But no attempt was made at all to do this before Middle Wallop TWR advised him of the Airprox. Members agreed unanimously that as the P68's transit of the CMATZ was not coordinated with Middle Wallop beforehand this was a significant part of the cause. That said, pilot Members understood that under the RIS that pertained it is ultimately a pilots responsibility to obtain, in good time, any necessary airspace clearances or penetration approvals and although the Brize Controller could most probably have assisted in this aspect if requested, given his light workload, the P68 crew could equally have identified this issue and asked the question. Whilst pilot Members emphasised that unlike their military colleagues civilian pilots are not required to 'recognise' MATZs, all agreed that it was far wiser to check on the traffic situation and obtain approval to penetrate the CMATZ from the appropriate ATSU. The Board was briefed that when contacted, the P68 pilot had mentioned to UKAB staff that the reason he had not done so was directly attributable to Bournemouth's comment that Boscombe Down was closed which led equally to a false sense of security on his part that all was well. Whilst understanding and empathising with the pilot's conclusion, that Brize RADAR had not mentioned the issue of CMATZ penetration to the P68 crew did not imply that this had been approved: a controller Member stressed this was another salutary learning point - that no comment from ATC did not imply tacit approval. The Board concluded that equally important here was that the P68 crew did not actively seek approval to penetrate the CMATZ. Members agreed unanimously that part of the Cause was that the P68's transit of the CMATZ was not coordinated with Middle Wallop by Brize Radar nor did the pilot seek approval.

Another aspect considered here was that the notification of activity at military aerodromes did not seem to some Members very robust. It was common practise for military aerodrome ATSUs to initiate an 'opening routine' when the airfield was open; to inform adjacent units, the D&D cell and the ACC etc that they were open, together with information on the Duty RW serviceability state, CC and crash state etc. Whilst the published operating hours of Middle Wallop were evident from military FLIPS, that of Boscombe Down - the controlling aerodrome - was not so clear. Nevertheless, this information would have been available from the ACC who can also route telephone calls direct to controllers at the respective aerodromes. Clearly, the UK AIP promulgated that Middle Wallop guarded the CMATZ penetration frequency when Boscombe Down was closed and only they were open. However, it looked as if the Unit did not comply with this but it was unclear, even if the P68 crew had called on 126·7MHz, whether they would have received a reply from Middle Wallop TWR, albeit that the crew had plainly decided there was no need to do so on this occasion. This caused controller Members some concern and some pilot Members were eager to propose a Safety Recommendation on this topic. Whilst the Board recognised that this aspect was not necessarily intrinsic to the cause of the Airprox, the Chairman agreed to look at this further, outwith the Meeting, with those agencies concerned with CMATZ policy.

[**Post Meeting Note:** when considering the specifics of the proposed Safety Recommendation, it became clear that action initiated by Mil ACC, DAP and ATSI shortly after the Board Meeting, to remove any possibility of confusion over CMATZ inter-unit procedures was already addressing the issues of concern. HQ Air Command, having discussed this matter internally post meeting, will ensure that these issues are brought to the attention of all units with or within a CMATZ and confirm that robust procedures are in place. Moreover, the wider matter of

opening/closing notification will also be addressed. Therefore when consulted after the Board Meeting, Members concluded that with such work already in hand any Safety Recommendation was superfluous.]

Turning back to the matter of the close quarters conflict in the CMATZ itself, the Lynx pilot had reported that they had spotted the P68 less than 100ft above them about 100m away in their 10 o'clock, when the P68 was crossing ahead from R – L, which in the Board's view was as soon as circumstances reasonably permitted. Whilst the PF attempted to level the helicopter and initiate an immediate avoiding action descent, he only managed to reduce their rate of climb enough to allow the fixed wing ac to pass directly overhead, he said with a *"very high"* risk of a collision. However, the P68 P-i-C reported they had seen the helicopter pass 300ft below them, heading in the opposite direction about 50m away down their starboard side. He added that no avoiding action was taken following the "late sighting" but there was no "threat" and he assessed the Risk as *"low".* Whereas the P68 co-pilot had observed the helicopter in his 2 o'clock - marginally earlier than the Lynx crew at about 150yd away - closing towards his ac he thought some 3-400ft below in a 30° AOB turn. In his view, although the sighting was too late to take any action, there was no threat as the helicopter passed just astern. This suggested to Members that although the P68 crew did not consider the helicopter's proximity a "threat" they had not seen the helicopter in time to take any avoiding action. Thus in the Board's view this was effectively a non-sighting, as the P68 pilots could not affect the outcome. At this point the Lynx crew would undoubtedly have had a better view of the proximity of the P68, however, and the radar recording had suggested that minimum vertical separation was about 200ft, taking into account the Lynx pilot's reported height of 2400ft QFE, just as the PF arrested the climb. Thus the helicopter crew, by forestalling their high-energy manoeuvre, had managed to take action just in time to resolve the conflict. This convinced the Members, who agreed unanimously, that a conflict occurring during their aerobatic display practise resolved by the Lynx crew was the other aspect of the Cause of this Airprox. Nevertheless, this action was taken at a very late stage and the helicopter crew were unable to increase the vertical separation before the P68 directly overflew their helicopter. Thus the vertical separation that pertained was somewhat fortuitous and the Board concluded the safety of the ac involved had certainly been compromised in the circumstances conscientiously reported here.

## PART C: ASSESSMENT OF CAUSE AND RISK

Cause:

(i) The P68's transit of the CMATZ was not coordinated with Middle Wallop by Brize RADAR nor did the crew seek approval.

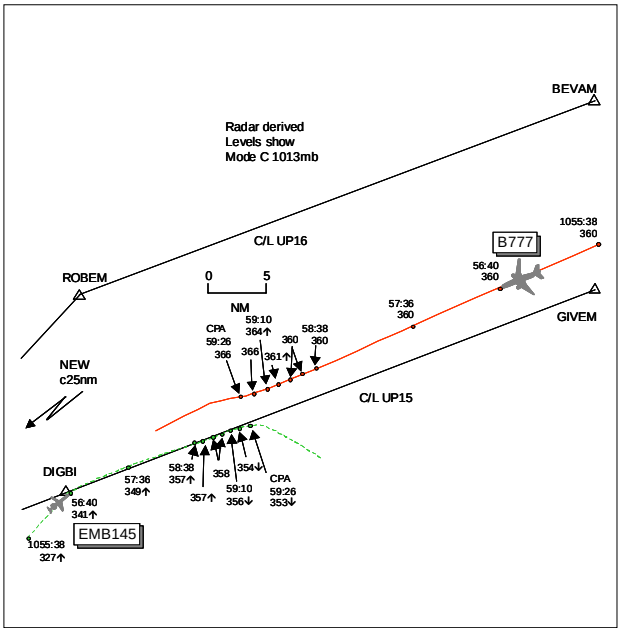
(ii) Conflict occurring during their aerobatic display practise resolved by the Lynx crew.

Degree of Risk: B.

## AIRPROX REPORT No 034/08

## AIRPROX REPORT NO 034/08

| | | |
|---|---|---|
| *Date/Time:* | 19 Mar 1059 | |
| *Position:* | 5518N 00038W (40nm ENE Newcastle) | |
| *Airspace:* | UAR UP15 | (Class: C) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | EMB145 | B777-300 |
| *Operator:* | CAT | CAT |
| *Alt/FL:* | FL358↑ | FL360 |
| *Weather* | VMC CLAC | IMC |
| *Visibility:* | >20nm | |
| *Reported Separation:* | | |
| | 500-2000ft V/ | 300ft V/ |
| | 1-2nm H | 4-5nm H |
| *Recorded Separation:* | | |
| | 800ft V/4·5nm H OR | |
| | 1300ft V/2·8nm H | |




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

**THE EMB145 PILOT** reports outbound from Leeds IFR and in receipt of a RCS from ScACC on 134·775MHz squawking 6236 with Modes C and S. Heading 060° and climbing through FL358 approaching their cleared level FL370, they received a TCAS TA on traffic showing 12nm ahead on an opposing track and 200ft above. ATC instructed them 'avoiding action turn R 20°' and this was almost immediately followed by a TCAS RA 'descend'. They informed ATC of the RA and were given a further R turn heading 110° which they actioned. The other ac was seen visually, either an A330 or B777, to pass 1-2nm clear to their L and 500-2000ft vertically above: the other flight was also given an avoiding action R turn and reported an RA 'climb'. He assessed the risk as medium.

**THE B777 PILOT** reports inbound to Glasgow IFR and in receipt of a RCS from ScACC squawking with Modes C and S. Heading 255° at M0.84 and cruising at FL360 routeing to NEW, a TCAS TA followed quickly by an RA 'climb, climb' were received. The ac was flown in accordance with the RA requirements and ATC were informed. The other ac was not sighted but was estimated to pass 300ft vertically and 4-5nm horizontally from them on their L. Apparently the other flight was cleared to climb through their level and had also reacted to an RA command. They regained FL360 and notified ATC of their intention of filing an ASR. He assessed the risk as high.

**THE ScACC TYNE/HUMBER PLANNER/TACTICAL** reports the traffic situation was complex and workload was becoming high on the bandboxed sector. The B777 was enroute via NEW and cleared to be level at FL260 by NEW. The EMB145 called level at FL310 requesting FL370 following UP15. Given the flight had achieved FL310 abeam NEW, he cleared it to FL370 anticipating this would clear traffic at FL320, 340 and the B777 at FL360. He then became distracted by a call from traffic in the GODOS area of the HUMBER sector requesting a direct routeing which appeared to be already off the expected route and was therefore traffic to 2 other ac inbound to Amsterdam and to an overflight. Radar headings were required to resolve this problem but the traffic was heading towards an active Danger Area so careful consideration and monitoring was taken. By the time he returned his attention to the EMB145's climb rate it was clear it would not achieve FL370 before passing the B777 so he gave avoiding action to both flights. The B777 crew reported a TCAS RA 'climb' followed seconds later when the EMB145 crew reported an RA 'descend'. He continued to apply further vectoring to increase the lateral distance between them so when they were abeam by 5nm both flights were returned to their own navigation.

**ATSI** comments that the crew of the B777 established contact with the Humber controller at 1038:30, and reported maintaining FL360. Initially there was a degree of confusion on the controller's part as another ac, an A330 from the same airline and with a similar trip number, was already on frequency having called some 30sec earlier. However, both ac were correctly identified. At 1038:50, the A330 crew requested descent and, having confirmed

its destination as being Newcastle, the Humber controller instructed the crew to descend to FL380 and to route direct to NEW. At 1041:20, the Humber controller instructed the crew of the subject B777 to route direct to BEVAM before changing this to ROBEM. However, at 1052:00, he instructed the crew to route direct to NEW.

The normal route for traffic inbound to Glasgow, the B777's destination, is along UP16 via BEVAM, ROBEM, NEW then UL602 to TLA. This route would have kept the B777 clear of the outbound EMB145 which would have been following UP15 (DIGBI, GIVEM), a route normally reserved for eastbound flights. The controller reported that he had routed the subject B777 direct to NEW due to his initial confusion between it and the A330 which resulted in the B777 and the EMB145 being on the same route but in opposite directions.

At 1053:00, the crew of the EMB145 called and reported climbing to FL310 inbound to DIGBI (24nm ENE NEW). The controller asked the crew their requested level, to which they replied FL370 and so they were instructed to climb to FL370. At this time the EMB145 was passing FL291 and opposite direction to the B777 which was maintaining FL360 at a range of 87nm. The controller reported that he was surprised at the excellent rate of climb of the EMB145 and so opted to climb it straight to its cruising level. It was already above the level of the A330 inbound to Newcastle but the controller had to climb it through traffic at FL320 and FL340 as well as the subject B777 at FL360.

The controller intended to monitor the situation: however, as he was working a bandboxed sector he was using 2 radar displays, one set to 95nm covering the Tyne sector and the other at 85nm showing the Humber sector. He became aware of a problem occurring near the Amsterdam boundary. Traffic inbound to Amsterdam is routed via VENAS then LARDI to be level at FL250 by LARDI whilst outbounds are routed AMGOD, GODOS and ROKAN climbing to FL240. Amsterdam took the decision, without coordination, to send one outbound direct to ROKAN which brought it into conflict with the inbound traffic routeing to LARDI. The controller had two situations that required attention, one in the top L side of one screen and the second in the bottom R corner of the other. Danger Area 323C was active and this required that headings had to be allocated to traffic both inbound to and outbound from Amsterdam which took up a large proportion of the controller's attention.

At 1055:40, when the EMB145, which was passing FL327, was 52nm from the B777, the controller instructed the crew of the B777 to descend to FL260 to be level by NEW. At 1058:38, the B777 had not yet started its descent and was now in the 12 o'clock of the EMB145, which was passing FL357, at a range of 12nm. The controller transmitted "*(B777 c/s) turn right ten degrees please*" but the crew replied with a request for the controller to repeat the heading. The controller immediately responded by instructing the crew of the EMB145 to turn R 20° as avoiding action and at the same time STCA activated. This was acknowledged and the crew of the B777 were instructed to turn R heading 290° as avoiding action. Immediately after this the B777 crew reported a TCAS climb and the EMB145 crew a TCAS descent. The controller then transmitted "*(EMB145 c/s) turn right immediate heading one hun one zero degrees traffic on your left hand side flight level three six zero*". The turns begin to take effect but separation reduced to a minimum at 1059:10, when the B777 was in the 11 o'clock of the EMB145 at a range of 4·5nm and 800ft above the EMB145.

[UKAB Note (1): The next radar sweep shows that although the horizontal separation decreases to 3·2nm, standard vertical separation is re-established as the B777 levels at FL366 whilst the EMB145 descends through FL354. The CPA occurs on the next sweep 8sec later at 1059:26 as the subject ac pass port to port, the B777 at FL366 passing 2·8nm NNW of the EMB145 level at FL353, 1300ft below.]

The unit investigation found that there had been problems with the strip production around the time of the Airprox. The details on the A330 inbound to Newcastle were printed out at 1022:28 but a flight readout was not requested until 1039:11, around 1min after the flight had reported on frequency. Shortly afterwards, a manual request for a strip was made. The details were therefore 'lost' for 17min. It would appear that strips were being printed and jamming in the machine, which robbed the controller of the ability to plan and/or detect some conflictions. It later transpired that the cause of the problem was some glue from the old print roll, but this would not generate an error message so the problem was initially undetected. An ATSA was requested and eventually the problem was resolved: however, the controller reported that it took him some 15min before he regained his full situational awareness.

At the time of the Airprox the controller was operating the Tyne and Humber sectors in a bandboxed configuration and was providing the functions of both Planner and Tactical. The sectors were described as 'busy and complex'. The Local Area Supervisor (LAS) had advised that the indications were that the sectors were going to get busy

and so a Planner had been summoned. The controller in situ advised that it would be better to split the sectors as few telephone calls were required but the traffic situation was complex. Unfortunately, there was some confusion in the conversation, as the LAS believed that the Tactical was declining the offer of a Planner and the comment about splitting the sectors did not register.

The Traffic Load Prediction Device (TLPD) used at the time of the Airprox had no complexity measure in it, the data provided simply giving a raw indication of traffic loading. If the Traffic Manager was not a valid North Sea controller then it is possible that an erroneous decision could be made in that a 'spike' in the traffic would be manageable. The controller had been in position for 45min when the Airprox occurred. At no stage during the incident did a Planner arrive at the sector or a sector split initiated. The unit investigation found that there was no record in the Watch Log of any staff shortages.

## PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The NATS Advisor informed Members that following this Airprox NATS Investigations raised 10 recommendations. Currently there is an ongoing review of Traffic Managers' training and proficiency through the establishment of a competency scheme for desk trained staff and LASs at ScOACC to ensure a uniform approach to staffing and implementation of flow.

Members could add little to the comprehensive ATSI report, agreeing that the bandboxing, busy workload and complexity of the sectors had played a major part in this incident which was not helped by lost fps production. A major indicator to a controller of pending increased traffic flow is the build up of fpss in the strip display a few minutes ahead of the traffic arriving on frequency.

Members wondered how the misunderstanding between the LAS and the Sector controller had occurred. The controller was wishing to split the Sectors but the LAS believed that his offer of a Planner was being declined. An ATCO Member opined that there are times when Supervisors should be more proactive and make decisions on behalf of the incumbent controller. After the initial confusion concerning the A330 and B777 flights with similar c/ss and the lack of fpss, the controller had routed the B777 direct to NEW, placing the flight on an opposite direction track to the EMB145's proposed route. About 1min later the EMB145 flight called and, basing his decision of its performance up until then, the controller had climbed the flight to FL370. Members agreed that in carrying out these actions, the Tyne/Humber Tactical/Planner had vectored the B777 into conflict with the EMB145 which had caused the Airprox.

The controller had intended to monitor the situation: however he had then concentrated on the traffic scenario near the Amsterdam boundary which needed close attention. A couple of minutes later he had then issued a conditional descent clearance to FL260 to the B777 flight, to be level by NEW, before turning his attention back to the other traffic situation in the Humber Sector. On returning his scan to the EMB145's climb performance, the controller had noticed the reduced ROC and decided to turn the B777 flight R: this occurred immediately before STCA activated. Avoiding action R turns were then given to both flights. Both crews had seen the potential conflict on TCAS and reacted promptly and robustly to the RA commands as well as turning as directed by ATC. The EMB145 crew visually acquired the B777 during the manoeuvre. These turns and robust actions taken by both crews allowed the Board to conclude that any risk of collision had been quickly and effectively removed.

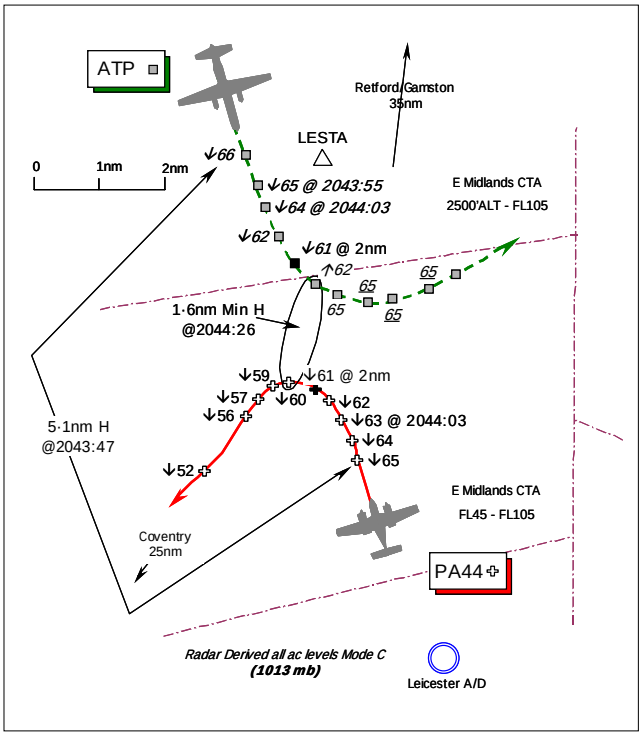
## PART C: ASSESSMENT OF CAUSE AND RISK

Cause: In a busy and complex traffic situation on a bandboxed sector, the ScACC Tyne/Humber controller vectored the B777 into conflict with the EMB145.

Degree of Risk: C.

# AIRPROX REPORT NO 035/08

| | | |
|---|---|---|
| *Date/Time:* | 8 Apr 2044 | NIGHT |
| *Position:* | 5242N 00104W (12nm SE East Midlands - elev 306ft) | |
| *Airspace:* | EMA CTA | (Class: D) |
| *Reporter:* | EMA APR | |
| | *1st Ac* | *2nd Ac* |
| *Type:* | BAe ATP | PA44 |
| *Operator:* | CAT | Civ Trg |
| *Alt/FL:* | FL62↓ | ↓3000ft QNH (1001mb) |
| *Weather* | VMC 'tween layers | VMC NR |
| *Visibility:* | 10km+ | 100km |
| *Reported Separation:* | | |
| *EMA APR: 2nm H* | | |
| | 500ft V/3m H | Nil V/<2nm H |
| *Recorded Separation:* | | |
| | Nil V @2nm H | |
| | 1·6nm Min H/200ft V | |




## PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

**THE EAST MIDLANDS APPROACH RADAR CONTROLLER (EMA APR)** reports that the ATP was inbound to E Midlands Airport (EMA) under IFR and being vectored under a RCS downwind LHD in the sequence for the ILS to RW27. He thought the PA44, also IFR, was en-route from Lelystad to Retford/Gamston. However, when the PA44 pilot was instructed to route direct Retford/Gamston the pilot informed him that Coventry was his destination, some 20nm astern. In order to facilitate the change of routeing into Coventry a descent was initiated. Before the ATP could be turned, another flight blocked the frequency requesting a lower level followed by the PA44 pilot requesting radar vectors for Coventry. Over the period of these transmissions the ATP was getting closer to the PA44 and so the ATP crew was instructed to turn L to provide separation. The PA44 was also turned L but the pilot did not comply. A second instruction to the PA44 pilot to turn and also to expedite descent was still slow to be actioned whereupon the ATP crew received a TCAS RA. Prescribed horizontal separation was eroded to 2nm.

UKAB Note (1): The RT transcript reveals there was only one transmission to the PA44 crew to turn L onto 230°, at 2043:40, which was read-back immediately whilst a steady descent was maintained.

UKAB Note (2): The Airprox occurred 040° (M) Coventry Airport 24½nm.

**THE BAe ATP PILOT** reports he was flying under IFR, descending into E Midlands in VMC whilst in receipt of a RCS. Descending to FL50 at 220kt on a radar vector of 160°, they noticed on the TCAS display another ac at about 1 o'clock at a distance of about 3nm, some 500ft above their ac on a converging track and also descending. The contact was confirmed visually and they noticed it starting a L turn.

ATC then instructed them to turn L onto a heading of 030°(M). As they were turning L through a heading of 160°, descending through FL62, TCAS enunciated a CLIMB RA. They complied with the TCAS command until the conflict was resolved at FL65 and then continued with their descent to FL50 and the turn onto the radar heading of 030°. Minimum vertical separation was about 500ft and the other ac passed some 3nm away with a *"medium"* risk of a collision.

**THE PIPER PA44 PILOT,** a flying instructor, provided a very frank and comprehensive account. He reports that he was the PNF conducting a night navigation instructional flight from the RHS for the student PF who was

occupying the LHS with two other ATPL student pilots aboard in the rear passenger seats. The flight consisted of seven legs Lelystad – Coventry (EGBE) – Lille – Liege – Hahn – Munster-Osnabruck - Maastricht – Lelystad, for which 7 FPLs were submitted.

He opined that the build up to this Airprox was a classical example of a "cascade effect" and started before the flight even commenced. The original handwritten IFR FPL with Coventry as the destination, Ostend as the alternate and E Midlands as 2nd alternate, was sent by FAX to the FPL reception office at Schiphol. [Copy of FPL, as written, provided.] The planned routeing was PAM > NIK > SASKI > LOGAN > LAM > DTY > SAPCO. As they received confirmations of all 7 FPLs, they just focused on the changes in routeings. They did not notice that the FPL reception office had corrupted the destination on the first leg to Retford/Gamston – EGNE - instead of Coventry - EGBE. [Copy of filed FPL provided.]

Before the flight he briefed his students that they could expect re-routeings, extensive radar vectoring and a lot of traffic as soon as they entered UK airspace. He also briefed them about the disadvantages of radar vectoring: the temptation to resume normal navigation after a while, especially when the original FPL track and radar vectors are very close, and disabling the initiative of the flight crew.

Initially the flight was uneventful but upon first RT contact with London CONTROL the confusion started. London CONTROL had no details on their flight. After mentioning the routeing of their active FPL, they were re-routed from SASKI – LAM and later BPK at FL100. In the vicinity of BPK they received radar vectors in a northwesterly direction. During the approach briefing, the student PF and he noticed that the reporting point SAPCO was not mentioned on the STAR chart from a SE'ly direction. He even made a mark of the approximate location of this waypoint on his STAR chart. The location surprised him as it is located N of the centreline of RW23 to Coventry. On the other hand it did not worry him as they were slow traffic and possibly in the way of faster traffic. Meanwhile, they were transferred to E Midlands RADAR. At their calculated top of descent they decided to wait for instructions from the radar controller since they were not aware of all other possible conflicting traffic on other frequencies. At approximately 30nm from Coventry they felt that it was about time and requested descent. They were cleared to FL80. At about 20nm from Coventry they asked for further descent. Apparently under the impression that EGNE - Retford/Gamston - was their destination the radar controller, clearly annoyed, started to point out what their position was. That surprised him because with a Garmin GNS530 and a Garmin GNS430, apart from the traditional navigation equipment, they had an exact idea of their position. He became even more suspicious when they received vectors further away from the centreline of Coventry (he believed it was a radar heading of 020°). From the moment they rolled out onto the heading given he spotted the two bright ac landing lights of opposite direction traffic – the ATP. Initially he was not concerned: since there was limitless visibility, the lights of many other ac were visible and distance on a clear night is difficult to estimate anyway. In the meantime he requested descent again, he thought. The radar controller responded that he would "vector them to your destination EGNE" or similar words to that effect. Only now it became clear to him that somewhere along the line there was an error leading to this misunderstanding. He tried to make clear to the controller that Coventry (EGBE) was their destination [some 58nm SSW of Retford/Gamston]. The radar controller however tried to convince him that EGNE was their destination because the information on the FPL [fps] in front of him said so. He finally gave up the argument and cleared them to descend to 3000ft, on a radar heading of 200° he thought, to intercept the ILS to RW23 at Coventry, as they were now N of the Coventry RW23 centreline. While the PF commenced a descending L turn to the new heading, the lights in front of him were still there and started to worry him now. To reduce the clutter he switched from the compass page on the Garmin to the TCAS page. The outer ring on the TCAS page was set to 6nm and the inner ring was set to 2nm. At that same moment he witnessed the white target symbol changing to yellow while entering the 2nm ring, accompanied by TCAS enunciating a TA of "TRAFFIC". Turning L from 020° onto 200° descending at 140kt through FL80, he thought, when he looked out he saw the opposite direction conflicting ac – the ATP - pulling up while turning to its L (to their R from their viewpoint) some 2nm away as its crew announced a TCAS climb RA on the RT. No RA was triggered in the PA44. Thanks to the excellent visibility at that moment, TCAS in both planes and the subsequent diverging flight path's there was in his opinion a *"low"* risk of a collision. Apparently the radar controller had forgot all about the opposite traffic (the ATP, as it now turns out) at the same level. They never heard avoiding action instructions for the ATP on their frequency. All four of them aboard the PA44 never missed an RT call, as had been suggested by the APR. On the contrary, he was in an almost constant conversation with the radar controller and very eager to get a descent and vectors to the ILS to RW23 at Coventry.

On the successive flight from Coventry to Lille, London ATC informed them that an Airprox had been filed and requested them to make a telephone call at the request of East Midlands ATC, which they did. The gentleman on

the phone confirmed the Airprox and asked whether he wanted to file an Airprox as well, which he did not as in his view there was only a low risk of collision.

It seemed to him that the controller had not realised that the situation was just as confusing for his students and himself as for the controller until it finally became clear that there was a mix-up with the destination from the FPL.

He added that as they flew 7 legs on this flight he does not recall all the headings and altitudes with certainty, but such will be revealed by the RT tape recordings.

In his view, the lessons he learned from this Airprox are:

Read all the details of the confirmed FPL carefully.

During prolonged radar vectors, mention at least once your destination to each successive controller.

Prolonged radar vectors place the responsibility of the flight path solely with the radar controller, increasing his workload and disabling the flight crew as they may assume they are vectored to the correct target.

Increase the TCAS range to 12NM on the Garmin 430 with (visual) opposite traffic.

Don't get angry when you have to concentrate.

**ATSI** reports with RT transcript that the subject EMA APR took over the RADAR 1 position at the start of the night shift, approximately 5min before the Airprox occurred, describing his workload as light to moderate. He did not consider it necessary for the RADAR 2 position to be opened.

The East Midlands 2050UTC weather observation, some 5min after the Airprox occurred, was surface wind: 220°/ 8kt; CAVOK; QNH 1001mb.

The ATP crew established communication with E Midlands RADAR at 2034. The pilot reported passing FL120, descending to FL100 on a radar heading of 060°, and was informed it would be vectoring for an ILS approach to RW27 at E Midlands. Shortly afterwards, the flight was instructed to turn R heading 110° and descend to FL80. As soon as the pilot of the ATP had read back this instruction, the PA44 crew contacted E Midlands at 2035:50, reporting on a radar heading of 350° and *"standing by for descent"*. The PA44 crew was instructed to *"maintain Flight Level 8-0 at the moment further descent in about 10 miles"*. The radar photograph for this time shows the subject ac just over 50nm apart, with the PA44's SSR label indicating that the flight was inbound to 'NE' (EGNE – Retford/Gamston), which is situated about 30nm NNE of EMA. The displayed E Midlands ATC radar SSR label for this ac would not have illustrated the destination: however this was shown on its fps. In accordance with a standing agreement with LTCC, Retford/Gamston traffic is treated as an E Midlands arrival initially and then routed and descended towards its destination by EMA ATC.

The subject night watch APR took over the RADAR 1 position at 2039. He commented that, at the time, the ATP crew was N of EMA and some 30nm N of the PA44, both ac maintaining FL80. The APR's plan was to position the ATP to the S of the airport for a LHD circuit to RW27. It would then fit into the circuit as number three behind other traffic from the N and another arrival from the S, both of which were on frequency. The APR's intention was to descend the PA44 on top of the ATP, maintaining 1000ft vertical separation, turning it towards Retford/Gamston as appropriate. Accordingly, shortly after taking over the RADAR 1 position, he instructed the ATP crew to reduce speed to 190kt, due to traffic ahead and to turn R heading 160°. This was to carry out his plan of positioning the ATP S of the airport, although he did not inform the pilot of this. The change of heading for the ATP resulted in the subject ac being placed on opposite direction conflicting tracks, at the same level. At 2040:20, the PA44 crew was informed *"your position is 5 miles to the south southeast of Leicester airfield route direct to Gamston"*. The PA44 pilot replied *"say again that point"*. The APR repeated, *"route direct to Gamston Golf Alpha Mike your destination",* whereupon the PA44 pilot stated *"roger er destination is er Daventry* [sic] *Coventry"*. [UKAB Note (2): A short discussion then took place about the ac's flight plan, the APR saying *"okay I got well your flight plan is echo golf bravo..er november echo*" following which the PA44 replied, *"that's the alternate.."*. The APR added *"okay you've actually filed for november echo the flight plan* [possibly meaning fps] *doesn't give us the alternate so er descend altitude 4 thousand feet QNH 1-0-0-1".*] The subject ac were now 22nm apart, still on conflicting tracks. During the next minute, the PA44 crew was twice instructed to continue heading 350°. [UKAB Note (3): At 2041:00, the PA44

pilot read back the descent instruction then requested *"..er we want er we you vector us now to Coventry?"*, to which the controller replied *"affirm"*. Thirty seconds later the PA44 pilot again queried *"..for my information ..you vector us now to Coventry".* Whereupon the APR advised *"affirm continue on your present heading for the moment report the heading"*, to which the pilot replied *"roger will do"* adding later "[C/S] *we are still on the radar heading 3-5-0"*. At 2042:00, the APR reaffirmed *"yeah like I say continue on the heading"* and the pilot acknowledged with *"wilco".*] The APR commented that at this stage it was not possible to turn the PA44 directly towards Coventry because it would have flown outside his delegated airspace. He explained that it had to be at 5000ft or below before passing a line running NW/SE, which passes just to the W of EMA. This is to establish separation from Birmingham departures. RADAR 1 confirmed that E Midlands ATC would not normally handle ac inbound to Coventry from the S. Also, in order to keep the ATP within airspace dedicated to E Midlands ATC, the crew was instructed to descend to FL50 at 2042:10, whereupon the pilot reported leaving FL80. At this time, the two ac were 15·3nm apart, the ATP was just to the E of EMA and the PA44, passing FL77, was some 22nm NE of Coventry. The APR believed that the relative descent profiles of the two ac would provide standard vertical separation, although, subsequently, this did not occur. [One minute later the pilot of the PA44 made further reference to his FPL to Coventry: *"just for your information we have a copy of the correct flight plan with Coventry*". The controller commented *"okay well whatever was filed it was actually filed with november echo as destination and bravo echo as alternate"* showing Retford/Gamston as the destination and Coventry as the alternate. To which the pilot responded *"well then the F-I-O makes er fault but er never mind".*] The APR commented that he allowed himself to be distracted by the topic of the PA44's destination and did not monitor the progress of the subject ac. However, following these transmissions about the FPL, the APR stated that he became aware of the confliction between the subject ac. Just as he was about to take remedial action, another flight called, preventing immediate implementation. The subject ac were, at the time, 7nm apart, the ATP passing FL70 in descent for FL50, and the PA44 FL67 for 4000ft QNH (1001mb).

At 2043:44, the PA44 crew was instructed, to "*..descend to altitude 3 thousand feet turn left heading 2-3-0 degrees"*. Immediately after receiving the PA44 pilot's readback, the APR instructed the ATP crew to *"turn left heading 0-3-0 degrees"*. Both headings tied in with the further routeings of the two aircraft i.e. the ATP into the EMA ILS pattern and the PA44 to Coventry. The radar photograph timed at 2043:47, when the ATP crew was issued with their turn, shows the subject ac on reciprocal tracks 5·1nm apart: the ATP passing FL66 and the PA44 FL65. At 2044:03, the radar photograph shows the PA44 starting its L turn, the aircraft are 3·5nm apart, the ATP passing FL64 and the PA44 FL63. The latter's crew was then instructed to *"expedite descent altitude 3 thousand feet"*. There was then a simultaneous transmission, followed by the ATP crew reporting just before 2044:20 a *"TCAS climb"*. The expedite call was repeated to the PA44's pilot, who reported having copied the instruction. During the event, the EMA APR did not use the term 'avoiding action' nor issue traffic information. At 2044:30, the pilot of the ATP reported *"TCAS conflict triggered er completed now descending back to Flight Level 5-0"*. The radar recordings of the event show both ac at FL61, having commenced their respective L turns 2nm apart. Thereafter, at 2044:26, it shows the CPA of 1·6nm, when the ATP was passing FL62, presumably climbing in response to its TCAS RA, some 200ft above the PA44 that is descending through FL60. Subsequently, the vertical and horizontal separations increase as the ac turn away from each other and the PA44 continues to descend as the ATP climbs, ascending to a maximum of FL66 before commencing its descent again.

The copy of the PA44 crew's FPL, supplied by FPPS at LAC Swanwick, shows the ac's destination as EGNE (Retford/Gamston), with alternates of EBOS (Ostend) and EGBE (Coventry). The latter part of the routeing was LOGAN - Airway L980, LAM L10 direct DTY direct SAPCO (ENE of Birmingham and S of EMA). There had been another FPL filed for the same destination, same departure time, but leaving CAS at Clacton. This had been cancelled about four hours before the Airprox at 1642.

Here it seems the EMA APR vectored the subject ac on conflicting tracks, without ensuring that vertical separation would be provided. In his view, the APR allowed himself to be distracted by the discussion with the PA44's pilot about his destination and did not monitor the progress of the two ac as they descended toward one another. Resolution of this conflict may have been delayed because the controller did not use the term 'avoiding action' or issue traffic information, when he realised the actual situation.

## PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It was notable that the E Midlands APR had been proactive in reporting this Airprox and the Board commended the controller for highlighting this situation between these two IFR flights in the Class D E Midlands CTA for the benefit of the whole aviation community, as it was apparent that this Airprox has several lessons for the unwary. Similarly, the Board applauded the PA44 instructor pilot's very comprehensive and frank account which had clearly revealed to the Members the catalyst to this encounter, which was the incorrect entry of EGNE inserted onto the PA44 crew's FPL by the flight plan reception office staff in Holland. From the detail conscientiously supplied by the PA44 pilot, it was clear this simple typographical error had sparked this Airprox and it was fair to say that the Company FPL staff should have spotted the error before take-off and either corrected it, or drawn it to the attention of the PA44 instructor pilot who was ultimately responsible for the veracity of his own FPLs. It was evident to the Board that neither the PA44 instructor nor his students had spotted this error before they departed and the opportunity to forestall this Airprox was thus lost before take-off – a salutary point and one highlighted by the instructor pilot himself.

Whilst the FPL destination error weighed heavily here as the root of the subsequent confusion – both in the air and on the ground – such errors are not uncommon an experienced ACC controller Member opined. This had resulted in the PA44 routeing further to the N of his destination than need be and being handed over to the E Midlands APR, instead of either to Birmingham or direct to Coventry as would normally have been the case. Consequently, in the mistaken belief that the PA44 was inbound to Gamston – which is not available for use at night and has no approach lighting it was pointed out – the E Midlands APR found himself in a situation that he should not have been placed in from the outset.

It was unfortunate that the error had not been discovered earlier and Members understood that there was considerable scope for confusion and frustration to develop unchecked. That another flight's initial call precluded immediate intervention might have been a factor but a pilot Member cautioned against blocking otherwise busy RT frequencies with unnecessary discussion. However, the PA44 pilot's point about mentioning the destination was soundly demonstrated by the events related here. Nevertheless, in the dawn of realisation between controller and pilot as to what had happened with the destination mix-up, it was clear that the APR's first responsibility was to ensure that the PA44 was separated from other traffic and then routed safely onward to Coventry. Members had some sympathy with the APR when faced with vectoring traffic into Coventry from the N which might not have been routine. Moreover, the airspace limitations placed on the APR were an added burden and would not have been apparent to the PA44 crew. Hence it would not have been clear to the latter's crew why they were still northbound to the N of Coventry, possibly adding to their frustration, as it was not possible to turn the PA44 directly towards Coventry until it was approaching 5000ft. Otherwise at a higher level, it would have flown outside the airspace delegated to E Midlands ATC! The distraction caused in resolving this issue was clearly contributory to the cause and would have increased the APR's workload significantly. Nevertheless, whilst vectoring the ATP into the E Midlands instrument pattern the APR should still have been able to keep these two ac apart where a minimum of 3nm horizontal separation was stipulated when less than 1000ft vertically was extant. For their part, the ATP crew had no influence on the cause of this Airprox other than to react promptly to the instructions issued by the APR, which they did. The comprehensive ATSI report had revealed that as the APR had allowed himself to become distracted from the task at hand by the FPL issue, it was when the ac were only 7nm apart that he realised the true nature of the situation, with both ac heading and descending directly towards one another in compliance with the APR's own vectors and descent instructions. Here was a salutary lesson for controllers, for the APR's plan had been to descend the PA44 on top of the ATP allowing for 1000ft vertical separation which required that he monitor the situation closely. That he did not do so was contributory to his lack of appreciation of the true situation and the resulting erosion of separation, a point that the APR had himself wisely acknowledged. Here then, in the ensuing close quarters situation, controller Members wholeheartedly endorsed the ATSI view that "avoiding action" should have been issued to engender a sense of urgency, which the situation clearly warranted, coupled with traffic information to ensure that both crews were aware of the close proximity of each other's ac. A controller Member opined that a vertical solution to the conflict would have worked by stopping the descent of one of the ac, but another member added the airspace limitations would have loomed large in the APRs mind. Weighing all these complex factors for relevance carefully, the Board concluded unanimously that the cause of this Airprox was that the E Midlands APR vectored the ATP and PA44 into conflict whilst distracted by the prolonged RT conversation regarding the PA44's destination.

Turning to the inherent Risk, the PA44 pilot had reported that he had been aware of the ATP for some time, both from his TCAS and visual sighting of the latter's lights in the clear night sky. However, the two ac were still at the same level only 2nm apart the radar recording revealed as they descended toward each other, but the APR's L turn and descent instruction to the PA44 crew was effective in dealing with the conflict. Whilst the controller would

not have known this at the time, the ATP crew had similarly spotted the PA44 visually as they complied with the APR's L turn onto 030°. The ATP crew also reacted promptly to their TCAS RA, which enabled them to climb above the descending PA44, thereby increasing the vertical separation. At the closest point of 1·6nm, both ac had now crossed with 200ft of vertical separation evident and both crew's now cognisant of each other's ac as they turned away, albeit for a time 'belly up' from one another. Therefore, in the Board's view, this all ensured that no actual risk of a collision had existed in the circumstances conscientiously reported here by all concerned.

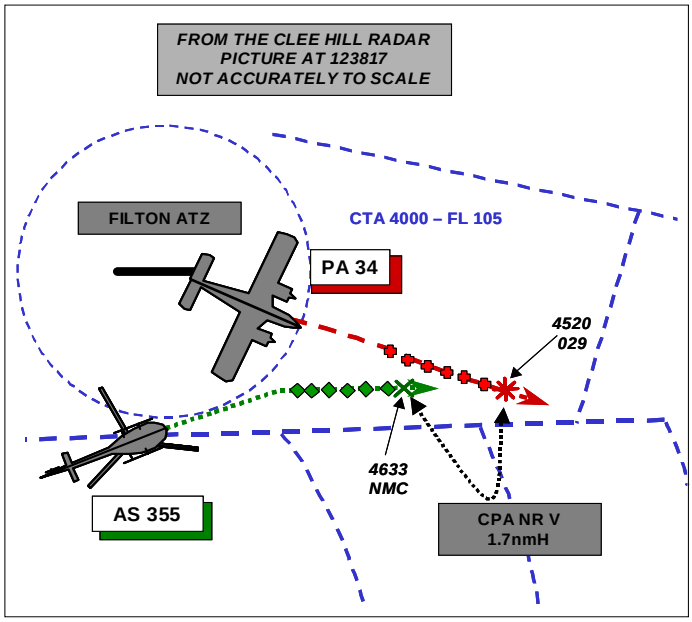
## PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The E Midlands APR vectored the ATP and PA44 into conflict whilst distracted by the prolonged RT conversation regarding the PA44's destination.

Degree of Risk: C.

## AIRPROX REPORT NO 036/08

| | | |
|---|---|---|
| *Date/Time:* | 1 Apr 1238 | |
| *Position:* | 5129N 00234W (SE Filton -elev 226 ft) | |
| *Airspace:* | London FIR | (Class: G) |
| *Reporter:* | Filton Controller | |
| | *1st Ac* | *2nd Ac* |
| *Type:* | PA34 | AS355 |
| *Operator:* | Civ Trg | Civ Comm |
| *Alt/FL:* | 3000ft (QNH NR | 1500ft (QNH NR) |
| *Weather* | VMC CLBC | VMC NR |
| *Visibility:* | 8km | >10km |
| *Reported Separation:* | NR | NR |
| *Recorded Separation:* | NR V/1.7nm H (see ATSI report) | |




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

**FILTON CONTROLLER** reports that while he was on duty as the radar controller, he saw an ac squawking 4633 just inside the Southern Filton ATZ Boundary. TI was requested from Bristol International who informed him that it was an AS355 at an altitude 2000ft (just inside the Filton ATZ).

Meanwhile a PA34, which was conducting instrument training at Filton, had been instructed to commence the outbound leg of a procedural NDB approach to RW27 but to remain not below altitude 3000ft in order to remain separated from opposite direction instrument traffic on the RW27 ILS. As the PA34 left the Filton overhead tracking ESE, the AS355 was observed tracking E, presumed still to be at 2000ft as no height was displayed on the radar.

Further information was requested from Bristol who said that they were moving the AS355 further to the E to remain clear of Filton. TI was passed to Bristol [International] regarding the PA34, as the ac would soon be descending on the outbound leg of the approach to an altitude of 1685ft.

When the PA34 reached 2000ft and was commencing the base turn, the AS355 still had not changed track nor called so he contacted Bristol again to find out if the AS355 pilot had the PA34 in sight to which he replied that he did not but he *"had them on TCAS".*

The AS355 passed the PA34 to its S and was then seen to cross the FAT at 10nm [he thought] and continue Eastbound with a Lyneham squawk.

**THE PA34 PILOT** reports that while carrying out an NDB/DME approach to RW27 at Filton, in receipt of a RIS from them and was advised of helicopter traffic in the area. They were held at or above 3000ft to avoid a conflict and when cleared they continued to descend in the procedure. The IF screens were up and, although advised of the traffic, they did not see it. Flight visibility from the PA34 is restricted downwards by the wings and the engines. He assessed the risk as being none.

**THE AS355 PILOT** reports that he had just completed a photographic detail over Bristol City Centre and told Bristol Radar he was complete, requesting that he set course to Fairoaks. He was told, *"cleared to east, at or above 2000ft VFR".* He set course for Fairoaks and on landing he had a message from Filton requesting that he call them. On calling he was informed that they were filing an Airprox between him and IFR traffic that was overhead and descending. He did not see the traffic and assessed the risk as none. (The report states that neither Mode C not TCAS was fitted).

UKAB Note (1): The recording of the Clee Hill radar shows the incident clearly. At the start of the recording (1236:20) a contact squawking 4633 (Bristol) with no Mode C (the AS355) can be seen over Bristol City turning right onto a track of E. The track takes the ac 2.5 nm to the S of Filton (ATZ 2.5nm diameter) and the ac track continues in an Easterly direction. Meanwhile the PA34, squawking 4250 with a Mode C of FL029, can be seen in the Filton NDB pattern tracking 110° outbound. The track crosses that of the AS355 1.7nm ahead remaining at FL029 before commencing a descent to FL019 in the turn inbound. The CPA (H) is after the ac are diverging and is 1.2nm; the PA34 displays a Mode C of FL022 but the EC355 still has no Mode C readout.

**ATSI** reports that the AS355 (callsign XXX04) was operating over Bristol City centre and was provided with a FIS from Bristol while squawking 4633 with no Mode C displayed. At approximately 1235, the pilot informed the Bristol APR that his photo survey was complete and that he intended to route eastbound back to Fairoaks. The APR approved this and requested that he remain not above 2000ft. APR saw that the AS355 was tracking N and so, at 1236:15, its pilot was advised to avoid the Filton ATZ (circle radius 2.5nm centred on the midpoint of RW 09/27), which the pilot acknowledged. TI was passed to Filton who requested that the AS355 turn S to avoid the instrument approach area as training was taking place. This was passed to the AS355 pilot but was acknowledged by the crew of a Jetstream 42 (callsign YYY104) that had departed Filton heading towards Brecon. The Jetstream crew asked the Bristol APR to confirm that he wanted them to turn right onto N: the APR repeated the instruction to turn right onto S in the belief he was addressing the AS355 pilot; the JS42 crew acknowledged this with their full callsign.

At 1239:05, Bristol APR, seeing that the AS355 was still heading E, asked the pilot to confirm that he was in a right turn to head S and again this call was acknowledged by the Jetstream crew. At 1239:20, Bristol APR informed the Jetstream crew that they were in receipt of a RIS and that they could expect a climb in 5nm. Bristol APR asked the AS355 pilot if he could see a PA34 in his 9 o'clock at half a mile and yet again the Jetstream crew took this call advising that although they were not visual they could see it on TCAS. At 1240:05, APR asked the Jetstream crew to confirm they were heading to Brecon but the AS355 pilot replied and asked if he could change frequency to Lyneham. Bristol APR then realised that a degree of confusion had taken place and instructed the Jetstream crew to take up a heading of 310º. The AS355 pilot called again and apologised for having his radio volume turned down and repeated his request to change frequency to Lyneham, which was approved.

The radar recording shows the PA34 tracking ESE towards the Filton overhead at FL038. The RTF recording shows that at 1032:40, the PA34 pilot reported that he was outbound in the hold and wished to cancel IFR, which was acknowledged by the Filton controller. The PA34 was instructed to maintain 4000ft and expect to be cleared outbound next time over the beacon. Further descent was given to 3000ft due to other traffic in the procedure, shortly before the PA34 passed over the beacon. As it passed overhead Filton, the AS355 was 3.1nm due S of it. The PA34 commenced the outbound track of the Filton RW27 NDB approach procedure (track 114º) and the AS355 is seen to turn onto an Easterly track and route away from the Bristol area. Shortly after reporting beacon outbound, TI was passed on the AS355 as being in the PA34's 5 o'clock at a range of 2nm. There is no evidence from the radar recording to indicate that the AS355 entered the Filton ATZ.

As the two ac continued on their converging tracks, the PA34 is seen to commence a descent and, at 1237:08, was indicating FL034 in the 10 o'clock of the AS355 at a range of 1.9 nm. By 1237:40, the PA34 was indicating FL031 in the 11 o'clock position of the AS355 at a range of 1.7nm. The PA34 continued to pull ahead and crossed, from left to right, through the 12 o'clock of the AS355 at 1238:21, when the distance was 1.7nm and the PA34 was indicating FL029. Some 40sec later, the PA34 commenced a left turn to intercept the inbound track and crossed back through the 12 o'clock of the AS355 at a range of 1.6nm. The AS355 continued on its Easterly track as the PA34 continued its left turn inbound and as the ac passed abeam each other [the PA34 then inbound], the lateral separation was 1nm, with the PA34 showing FL019 and the AS355 not displaying any alt information.

## PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board was briefed that, although the AS355 had passed close to the Filton ATZ, the radar recording showed that it had not infringed it; it had however passed below the Filton instrument pattern, which was active with the PA34. Since the helicopter was not Mode C equipped (confirmed from the pilot's report) the Controller had no altitude indications and had asked Bristol for information and they confirmed that it was at 2000ft and clearing to

the E VFR. The Filton Controller had therefore kept the PA34 at 3000ft on the outbound leg and thereby prevented any confliction between the 2 ac before allowing the PA34 to descend as it turned back inbound.

(Although not directly contributing to this incident one experienced Helicopter Member considered it inappropriate for the AS355, which was engaged in commercial work, not to be Mode C equipped.)

**PART C: ASSESSMENT OF CAUSE AND RISK**

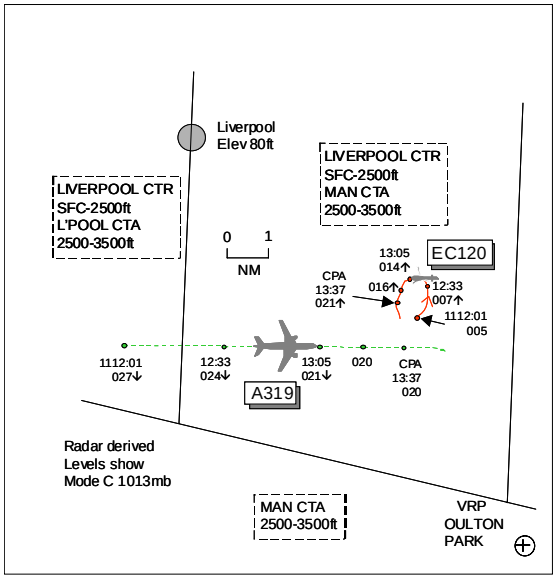
Cause: Controller perceived confliction.

Degree of Risk: C.

## AIRPROX REPORT No 037/08

## AIRPROX REPORT NO 037/08

| | | |
|---|---|---|
| *Date/Time:* | 3 Apr 1114 | |
| *Position:* | 5315N 00242W (7nm SE Liverpool - elev 80ft) | |
| *Airspace:* | CTR/CTA | (Class: D) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | A319 | EC120 |
| *Operator:* | CAT | Civ Pte |
| *Alt/FL:* | 2500ft (QNH) | 900ft (QNH 1032mb) |
| *Weather* | IMC KLWD | VMC CLBC |
| *Visibility:* | | 8km |
| *Reported Separation:* | Nil V/1nm H | Not seen |
| *Recorded Separation:* | 100ft V/1nm H | |




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

**THE A319 PILOT** reports inbound to Liverpool IFR and in receipt of a RCS from Liverpool on 119·85MHz squawking with Mode C. When downwind LH [for RW27] heading 090° in IMC at 2500ft QNH and 215kt, they were aware of the subject EC120 flight which had inadvertently gone IMC and which was believed to be maintaining 2000ft. The EC120 flight was given a heading of 300° and instructed to maintain 2000ft. They then received a pop-up TCAS TA, amber target indicating -00↑ just behind their L wing, range 1nm. They expected an RA but did not receive any command. ATC turned them R 30° but this was not given as 'avoiding action'. The FO monitored the helicopter which was seen on TCAS to climb to 5000ft and they continued normally for landing at Liverpool. The Captain telephoned ATC after landing to discuss the incident and was informed of the EC120 flight's climb above cloud; its 30min endurance and subsequent let-down over the sea before being guided into Liverpool. He assessed the risk as high.

**THE EC120 PILOT** reports flying solo inbound to Liverpool from a private site near Nantwich (20nm SE Liverpool) VFR and in receipt of a RCS from Liverpool on 118·95MHz squawking 0260 with Mode C. He was not aware of an Airprox but provided a comprehensive report of his flight. He regularly flies from his private site to another private site in N Liverpool and occasionally flies into Liverpool airport for fuel. On this flight he was intending to pick up a passenger, another pilot, from Liverpool before flying S. The weather reports showed a high pressure system on the W side of the UK with a warm front orientated N-S down the E side, with a forecast of overcast cloud with poor visibility in coastal areas. The Liverpool METAR was giving 8000m visibility and a 900ft cloudbase so he departed Nantwich at about 1145 local with 40% fuel (80min) for the 25min flight. He called Liverpool O/H Nantwich and obtained clearance to enter the CTR via WHI, VFR not above 1500ft under a RCS. On initial contact he was given the QNH of 1032, one millibar different from the QNH 1031 he had noted from the earlier METAR. However, what he did not notice until after landing at the end of this flight was that he had set the altimeter sub-scale 10mb too low: hence he was flying 300ft higher than he thought. The weather conditions appeared consistent with the reports and he flew at an indicated 900ft at 80kt. He was asked to route to Helsby from WHI, Helsby Hill being a small outcrop on the S bank of the Mersey to the SE of the airport orientated N-S and rising to 400ft amsl with a gentle slope from the E and a steep descent (cliff) on the W. All proceeded well and he felt completely comfortable up to the point where he crossed the hill and the ground fell away steeply but then he suddenly and unexpectedly entered cloud. The only experience he had of IFR/IMC was the 5hr training included in his PPL(H). He commenced a 180° turn in cloud with the intention of backtracking but became concerned with his control of height and, being conscious of the hill, he commenced a climb. He quickly transmitted a PAN call and advised his intentions of climbing up through the cloud cover and requested an indication of what height he might expect that to be. He then concentrated on controlling the helicopter and was given headings to steer by Liverpool ATC, finally emerging from cloud at 4500ft whilst being directed down the Dee Estuary out to sea. The time above cloud was used by himself and ATC to assess the situation and consider the options. There were no

breaks in the cloud to descend through and his fuel situation was not pressing, standing at about 30%. He coasted out for a few miles and then turned back towards the coast at Point of Ayr, began a descent on this track and broke out of cloud at about 1000ft indicated. By now his fuel state was 20% but he estimated that he required less than 10% to reach Liverpool so he continued the flight low-level. After landing ATC informed him that a pilot of a passenger jet had experienced a TCAS warning and that he should be aware of the matter.

**THE LIVERPOOL APR** reports that at 1113 the EC120 pilot declared a PAN over Helsby, 5nm SE Liverpool, owing to IMC and climbed immediately to 4000ft altitude without ATC clearance. Meanwhile the A319 was being vectored for a LH cct for RW27 and was turned SE to widen around the helicopter. The EC120 pilot was unable to accept an IFR clearance so was steered to the NW of Liverpool for a cloud-break over the sea. Liverpool and Manchester departures were stopped to allow the helicopter to have the area, the pilot stating endurance until 1200 and 1POB. At 1130 the EC120 pilot was informed that his position was West Kirby and that he could descend at his discretion on his track over the sea. The helicopter broke cloud 3nm N of Point of Ayr heading S: its pilot saw the coastline and set course for Liverpool, landing at 1137.

The Liverpool METARs show EGGP 031050Z 29011KT 8000 SCT008 BKN021 12/08 Q1032= and EGGP 031120Z 28010KT 7000 SCT005 BKN010 11/08 Q1032=

**ATSI** comments that the EC120 flight established communication with Liverpool Approach at 1059. The pilot reported inbound to Liverpool from Nantwich, presently at 900ft. He was cleared to join at Oulton Park for 'standard VFR' for RW27 and was requested to squawk the Liverpool conspicuity SSR code 0260. The UK AIP, Page AD 2-EGGP-1-12, states the flight procedures for VFR flights into Liverpool. These include: *'In order to integrate VFR flights to/from Liverpool Airport with the IFR traffic flow, standard routes are established along which VFR clearance will be issued (subject to certain conditions). Non-standard routes may be requested but ATC approval will only be granted if the traffic situation allows. Pilots are reminded of the requirements to remain in VMC at all times and to comply with the relevant parts of the Low Flying Rules, and must advise ATC if at any time they are unable to comply with instructions'*. The inbound route from the S for RW27: *'Enter CTR via VRP Oulton Park, route to the western edge of Helsby, then as directed by ATC'*. The maximum altitude is 1500ft. The EC120 flight reported at Oulton Park at 1105 and was instructed to route to Helsby, to report the airfield in sight. Helsby is approximately 6nm SE of the airport, just S of the M56.

The A319 flight contacted Liverpool Approach at 1107, approaching from the SW. It was, subsequently, vectored to the ILS RW27. At 1110, in descent to 3500ft, it was instructed to turn L heading 090° to position LH downwind. Just after this, the EC120 flight, not yet having reported visual, was instructed to hold at Helsby and contact the Tower frequency. The radar timed at 1110:55, shows the EC120 at FL005 (1070ft QNH 1032mb), 6·5nm SE of the airport and the A319 approximately 8nm SW of the airport, turning downwind and descending through 3800ft. The A319 was given descent to altitude 2500ft.

Just after 1112, the following clipped transmission was received *"PAN PAN PAN PAN helicopter (part of registration i.e. second and third letter)"*. The controller requested the PAN caller to repeat the registration. The EC120 pilot responded stating *"Helicopter EC120 c/s I've er into M- er I- IMC"*. The controller suggested *"...if you er take up a heading of approximately er three zero zero degrees to take you er towards the field"*. There was no reply to this transmission. The controller continued *"EC120 c/s are you happy to maintain your own er terrain clearance and fly headings"*. The pilot responded *"Er negative er EC120 c/s I'm actually climbing out of the cloud erm at altitude two thousand feet"*. The radar recordings show that from 1112, the EC120 commenced a LH orbit, climbing above FL005 (1070ft QNH).

[UKAB Note (1): The CPA occurs at 1113:37 with the A319 tracking E level at FL020 (2550ft QNH) passing 1nm S of the EC120 which is turning through a S'ly heading climbing through FL021 (2650ft QNH).]

During this 90sec period the controller was concerned with dealing with the EC120's situation and only turned the A319 R heading 120° (just after 1113:30) after the EC120 pilot reported climbing out of the cloud. The term avoiding action was not used but by this time, because of the speed variance between the subject ac, the A319 had passed ahead of the EC120. The EC120 continued to climb and turn, as the A319 was vectored clear of it. The EC120 subsequently made a successful landing at Liverpool.

## AIRPROX REPORT No 037/08

### PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

A specialist helicopter Member opined that the EC120 pilot had done very well in this incident considering his experience. The Member went on to say that as the ac was an unstable platform to fly in IMC and was not certified to fly IFR, this event could have easily turned into a very nasty incident. Another helicopter Member opined that although the EC120 pilot had followed the recommended procedure of initiating a 180° turn in an attempt to return to the VMC Wx that he had just left, continuing into an orbit could have exacerbated the situation by accelerating the pilot's disorientation and possibly leading to a premature loss of control. However, on this occasion the pilot had maintained control and eventually broke clear of cloud at 4500ft before later initiating a controlled descent over the Dee Estuary. Thus, following inadvertent entry into IMC, the EC120 pilot had climbed his ac to a safe altitude and, in an attempt to regain VMC, had flown his ac into conflict with the A319 which had caused the Airprox.

The Liverpool APR had tried to assist the EC120 pilot by giving vectors towards the airport but this was refused as the pilot was in the early stages of controlling his helicopter having transitioned from VFR to IFR in IMC. Also, an ATCO Member opined that whilst the APR had been mindful of his obligations to the 'emergency' traffic, he had ensured that other ac did not impede its progress. At the time the A319 was steady downwind at 2500ft, its crew cognisant of the EC120 pilot's predicament but believing the EC120 flight was restricted to 2000ft. Consequently they were surprised when TCAS triggered a pop-up TA alert with traffic indicating co-altitude and climbing but only as it was passing 1nm clear to their L and behind. The radar recording reveals the slow-moving EC120 orbiting to the N of the A319's intended track with the CPA occurring after the A319 had quickly passed S of the EC120 which was turning through a S'ly heading. Although this had had the potential for being a more serious incident, taking into account the actual geometry that pertained at the time the Board believed that there had been no risk of collision during this encounter.

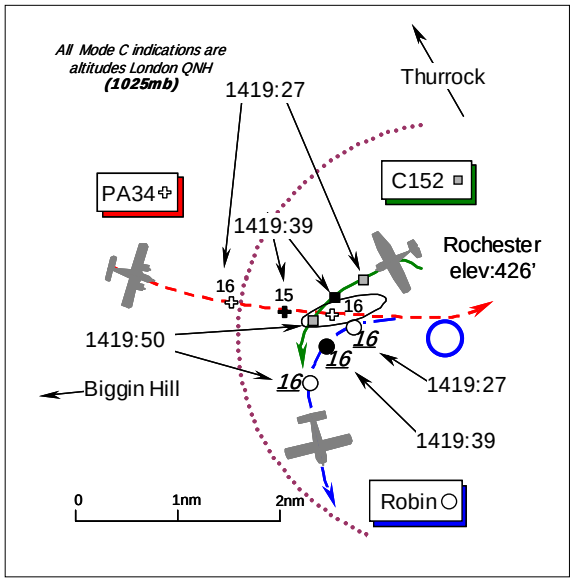
### PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Following inadvertent entry into IMC, the EC120 pilot climbed his ac into conflict with the A319.

Degree of Risk: C.

# AIRPROX REPORT NO 038/08

| | | |
|---|---|---|
| *Date/Time:* | 4 Apr 1419 | |
| *Position:* | 5121N 00028E (1½nm W Rochester Aerodrome - elev 426ft) | |
| *Airspace:* | Rochester ATZ | (Class: G |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | C152 | PA34 |
| *Operator:* | Civ Trg | Civ Pte |
| *Alt/FL:* | 1050ft | 1500ft |
| | QFE (1010mb) | QNH |
| *Weather* | VMC CLBC | VMC CLOC |
| *Visibility:* | 10km+ | 10km |
| *Reported Separation:* | | |
| | 50-100ft V/50m H | Not seen |
| *Recorded Separation:* | | |
| | Not recorded | |




## PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

**THE C152 PILOT,** a flying instructor, reports he was conducting a training flight for a lapsed PPL holder at Rochester A/D and in receipt of an AFIS from Rochester INFORMATION on 122·25MHz. They were operating in the LH cct to RW34 on the second cct after an enforced go around, because the student was too high and fast on FINALS. Completing the turn onto the crosswind leg he was aware of a helicopter that had departed from Rochester to Brands Hatch, "low level to the west". He identified this traffic, which was by now outside the normal cct pattern and climbing through the circuit height. At the same time a Robin DR500 was joining the cct from the DEADSIDE. The Robin was flying parallel to his track, on a heading of 250° about 800m away to port, and held his attention as he would be unable to make the DOWNWIND turn until the Robin pilot had started his turn DOWNWIND. Towards the end of his CROSSWIND leg heading 250° about 1½nm W of the A/D at 90kt, just as the Robin pilot had started to turn downwind, he spotted a light-coloured twin-engine ac appear from behind his ac's RH door pillar, only about 100-150m away. The twin – a PA34 - was heading roughly E and slightly above his height of 1050ft QFE (1010mb), with its undercarriage retracted. He immediately took avoiding action by banking R and pushing the nose down, in a dive of about 45°, as the PA34 passed some 50m to port and 50-100ft above his aeroplane with a *"medium"* risk of a collision; he recovered the ac to level flight about 200ft lower. He does not think that the pilot of the PA34 took any avoiding action. He cited workload in the cct and the presence of the two other circuiting ac as significant factors.

He reported the close encounter to Rochester INFORMATION who by this time had seen the twin – the PA34 - fly through the Rochester overhead. It turned N in the overhead and was watched with binoculars. The PA34 then turned W about 4nm N of Rochester and disappeared from view.

**THE PA34 PILOT** reports he had departed from Biggin Hill in VMC under VFR to deliver his ac to Thurrock for annual servicing. His intention was to fly NE, picking up the DET 330° radial thence to Thurrock at 1500ft QNH. Heading 060° at 140kt, he was not aware of the Airprox location but he only noticed one ac at about the same height as his twin, well ahead in the 2 o'clock position flying in a N – S direction that was "no problem".

He was aware that his route to intercept the 330° RAD from Detling VOR would take him in the direction of Rochester but felt that he would be to the N of them and clear. In hindsight, he should have contacted them on 122·25MHz but was more concerned with working Thames RADAR who provided a FIS on 137·7MHz. Whilst working Thames RADAR to landing at Thurrock, he was requested to report landing which he did from the ground on his ac's radio. The ac flown by the reporting pilot was not seen and no avoiding action was taken; he opined the risk was *"low"*.

## AIRPROX REPORT No 038/08

**THE ROCHESTER AFISO** commented that a PA34 Seneca was observed from the Control Tower over-flying the aerodrome W – E at an estimated altitude of 1500ft. A C152 pilot in the cct to RW34 made an RT call informing him of a near miss with a twin and of avoiding action hurriedly taken. The RT exchange revealed that several ac on frequency had seen "a twin" at around 1500ft. A call to ATC at Biggin Hill revealed that a Seneca [C/S given] had departed Biggin Hill at 1412UTC for Thurrock. This was considered significant as the subject ac had turned N then W before it disappeared from view.

The conflict was not seen by the Rochester AFISO.

**ATSI** reports no apparent ATC causal factors. The RT recording confirms Thames RADAR did not identify the PA34 and only provided the pilot with a FIS. Although the pilot did not (and was not required to) read back the type of service being provided, he stated he was in receipt of a FIS in his written report. When the PA34 pilot contacted Thames RADAR the ac was squawking A7000, 2·8nm W of Rochester. The pilot reported *"From Biggin Hill to Thurrock at presently at 1 thousand 6 hundred feet and approaching Rochester at this time with a north turn"*. After further transmissions with the PA34 over the next 40sec, the Thames RADAR Controller turned his attention to vectoring 2 flights inbound to, and 2 flights outbound from, London City Airport. In this time the PA34 flew onward into the vicinity of Rochester. No further RT calls were received from the PA34 pilot until he landed at Thurrock.

UKAB Note (1): The UK AIP at AD2-EGTO 1-3 notifies the Rochester ATZ as a radius of 2nm centred on RW16/34, extending from the surface to 2000ft above the aerodrome elevation of 426ft amsl. An AFIS is provided callsign Rochester INFORMATION on 122·250MHz in 'summer' between 0700-1700UTC

UKAB Note (2): This Airprox is not shown clearly on recorded radar as the contact which is believed to be the C152 flown by the reporting pilot is only shown intermittently and the ac's SSR was selected to 'standby'. However, the PA34 is shown squawking A7000 with Mode C as it approached Rochester A/D from the WNW. Another ac is shown joining the circuit to RW34 and is believed to be the Robin that the C152 was following - possibly the ac seen by the PA34 pilot. The PA34 is shown entering the Rochester ATZ shortly after 1419:27, flying at 1600ft London QNH (1025mb) - an altitude of 1600ft London QNH (1025mb) would equate to a height of about 1150ft QFE (1010mb) - as the C152 is shown displaced to the NNE of the Robin CROSSWIND in the cct as reported. The PA34 descends slightly to 1500ft London QNH – about 1050ft QFE (1010mb) - it converges on the C152, which is shown in the PA34 pilot's L 11 o'clock at a range of 0·4nm with the Robin opening in the 01:30 at a similar distance. Primary radar contact on the C152 is then lost as the PA34 maintains a steady eastbound track towards Rochester. The C152 is not shown again until 1419:50 - after the Airprox has occurred - as the PA34 draws aft in the C152 pilot's 8 o'clock, hence, the minimum horizontal separation cannot be determined but is likely to have been broadly in line with that reported by the C152 pilot.

### PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Pilot Members were of the view that this Airprox could have been avoided at the flight planning stage. An alternative routeing staying clear of Rochester was entirely feasible whilst flying from Biggin Hill to Thurrock, a routeing which, Members agreed, was certainly preferable to that flown by the PA34 pilot. Under the FIS provided by Thames RADAR, the controller had no responsibility to maintain track identity on the PA34 or to warn the pilot of the proximity of Rochester. Consequently, it was entirely the responsibility of the PA34 pilot either to remain clear of the Rochester ATZ or, alternatively, to call Rochester INFORMATION to ensure that he had sufficient information about the a/d cct traffic so that the flight could be conducted with safety.

From his report, it was evident that the PA34 pilot had recognised the proximity of Rochester aerodrome to his chosen route into Thurrock. It was also clear that the PA34's track had taken the ac through the ATZ at an altitude that was very likely to conflict with arriving, circuiting and departing traffic. It was unfortunate, therefore, that the PA34 pilot had not appreciated earlier that his track and altitude had taken him straight towards and into the Rochester ATZ which was penetrated without any communication with the Rochester AFISO. Undoubtedly, had the PA34 pilot called beforehand, the AFISO would have informed him about both the Robin and the C152 flown by the reporting pilot. In the event, it appeared from the PA34 pilot's report that he had spotted the Robin to starboard but had evidently not sighted the C152 which would have been plainly in his field of view: this non-

sighting was part of the cause. In the Board's view the C152 pilot should not have been placed in this situation and it was very fortunate that he saw the PA34 when he did. The radar recording had clearly illustrated the track of the PA34 through the Rochester ATZ and the Rules for entry into an ATZ are quite specific and clearly promulgated. This Airprox was a salutary reminder of the necessity for compliance with established procedures as without any specific information about the cct traffic beforehand, it was evidently not only unwise to enter this airspace but also contrary the Rules of the Air. The Members concluded unanimously that this Airprox had resulted because the PA34 pilot entered the Rochester ATZ in contravention of Rule 45 of the Rules of the Air Regulations and flew into conflict with the C152 which he did not see.

Turning to the inherent risk, the PA34 pilot's non-sighting of the C152 and the separation reported by the latter's pilot of a mere 50-100ft below the twin was of concern to the Members. Unfortunately the absence of recorded primary radar data on the C152 in the final stages of this Airprox did not allow the CPA to be measured. However, there was no reason to doubt the veracity of the reporting pilot's account and the available radar data did indicate clearly that this was a close quarters encounter. Fortuitously the C152 instructor pilot had spotted the twin and had managed to take robust avoiding action by diving out of the way which had effectively removed the actual risk of a collision but the PA34 had only been seen about 100-150m away and thus this was indeed a late spot by the instructor. Therefore, with the PA34 pilot unsighted to the close proximity of the C152 the Members agreed unanimously that the safety of the ac involved had certainly been compromised.

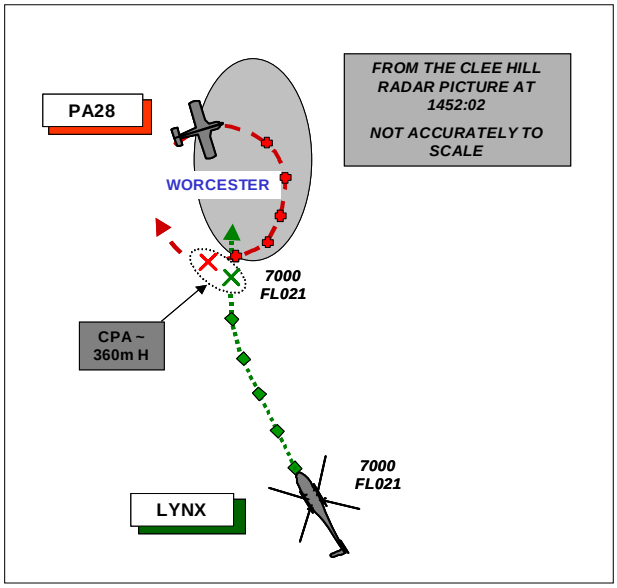
## PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The PA34 pilot entered the Rochester ATZ in contravention of Rule 45 of the Rules of the Air Regulations and flew into conflict with the C152 which he did not see.

Degree of Risk: B.

## AIRPROX REPORT NO 039/08

| | | |
|---|---|---|
| *Date/Time:* | 9 Apr 1452 | |
| *Position:* | 5209N 00213W | (½nm S Worcester) |
| *Airspace:* | London FIR | (Class: G) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | Lynx Mk7 | PA28 |
| *Operator:* | JHC | Civ Pte |
| *Alt/FL:* | 1500ft | 1500ft |
| | (RPS 998mb) | (QNH) |
| *Weather* | VMC CLBC | VMC RAIN |
| *Visibility:* | >10km | >10km |
| *Reported Separation:* | | |
| | 0ft V/200m H | NR |
| *Recorded Separation:* | | |
| | NR V/0.2nm (360m) H | |




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

**THE LYNX MK7 PILOT** reports flying a camouflage grey/green ac with nav lights and strobes switched on, on a VFR training flight from Brize Norton to Dishforth, squawking with Mode C and in receipt of a FIS from Gloster APP. He was in the RH seat and was the handling pilot and ac commander while the non-handling pilot in the LH seat was map reading and undergoing commander training.

They were heading 358° at 120kt and 1500ft amsl. Just before the incident, he had seen an unidentified light ac about 5nm away in his half past twelve moving from left to right. With hindsight he believed that it might have been the same ac as the one he conflicted with later.

During the actual incident he saw the light ac very late due to its approaching from a windscreen blind-spot (behind the A frame around the front window) and its acquisition was not helped by the neutral grey sky in the distance, further masking the beige-coloured ac.

On seeing the low wing single–engined ac 500m away in his 1 o'clock, he initiated a hard turn to starboard once they had positively identified the other ac and confirmed that it was not taking any avoiding action. The pilot of the other ac was seen looking out of his right window, apparently at something on the ground, and the reporting pilot thought that the other pilot had not seen his helicopter.

Although the radar analysis might show that the Airprox was not actually as close as he initially thought, he considered it too close since they only had a very short time to respond to the approaching ac.

He reported the incident to Gloster APP and assessed the risk as being high.

**THE PA28 PILOT** reports flying a white ac with a red stripe with the anti-coll beacon switched on, on a private VFR flight from Coventry to Shobdon. He was squawking with Mode C [he thought], in receipt of a FIS from London Info and was flying at 1500ft amsl. Since the cloudbase over the hills on the leg to Shobdon was too low, he turned S and returned to Worcester where the weather was slightly better, telling London of his intention to delay in an orbit to see if there would be any improvement. He was orbiting to the right over Worcester at 95kt below cloud in light rain, when required updating London of his actions, and was told to report when he was leaving Worcester. While passing through a W'ly heading in an orbit he saw a large camouflaged helicopter ½ to 1nm to the S, pointing directly towards them and closing. He decided the best avoidance was to continue the orbit so that the helicopter would pass behind him thus giving it the greatest possible separation in the circumstances. He considered whether to call London Info to enquire about any military helicopter activity in the area but, since it had already passed and the helicopter went out of view to the N very quickly, he did not see the reason to call.

Around 5min later a Lynx helicopter came onto the London FIS frequency reporting overhead Kidderminster, flying from Brize to Manchester and onward, but since the ac had passed his location some time before, he did not see any reason to pass his details. Around 15min after the incident he left Worcester and returned to Coventry via Draycott Water since there had been no improvement in the weather.

He assessed the risk as being high but could not estimate the minimum separation because the other ac passed behind him.

**THE GLOUCESTER CONTROLLER** reports that the pilot of a Lynx helicopter, which was in receipt of a FIS en route from Brize Norton to Dishforth, reported that at 1453 he had had an Airprox with a PA28 at 1500ft in the vicinity of Worcester. They had no known traffic reported in that area.

The GLOS METAR at 1450 UTC was: 22007kt 30km FEW 025CB FEW 028 TCU, SCT 040 10/02 QNH 0998. Cotswold RPS 994mb

**ATSI** reports that the Lynx pilot first established communication with Gloster APP at 1440, reporting 7nm E of Cheltenham at 1500ft, enroute VFR from Brize Norton to Dishforth. He requested a FIS, stating the he was routeing along the M5 and at the M50 junction would turn N, then route via Shawbury and the Manchester Low Level Corridor to Dishforth. The controller confirmed a FIS and requested the pilot to report abeam Malvern, passing the Cotswold RPS of 994mb.

The next communication with the Lynx was at 1452, when the pilot asked if ATC were working anyone in the Worcester area. Receiving confirmation that nothing had reported in the area, the pilot asked if there was any radar contact on a fixed wing aircraft and the controller replied negative. The pilot stated his intention of filing an Airprox, commenting that a small ac (he believed a PA28) circling over Worcester had cut him up quite badly. He had to take avoiding action at 1500ft, about four minutes previously.

No apparent ATC causal factors, as only one of the subject ac was in communication with Gloster and that was only being provided with a FIS.

**HQ JHC** did not wish to comment.

## PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members noted that both ac had been operating legitimately, VFR in Class G airspace, in showery weather that was more severe to the N of the incident area. On encountering the area of poor weather, the PA28 pilot sensibly returned to a position further to the S where he knew conditions were better and entered an orbit to the right while waiting to see if the weather improved. The Lynx was approaching the area of the PA28's orbit from the better weather area to the S and apparently its pilot had seen the PA28 in his 1230 before the incident, possibly at the Northern end of the latter's orbit. An experienced military helicopter Member was surprised that despite the instructional nature of the Lynx flight, neither of the pilots had maintained visual contact with the PA28 while in its orbit. Even on such instructional flights, he opined, both pilots had a responsibility for lookout. Had this been done the PA28 would only have been in one pilot's blind spot and would have been visible to the other.

Under the Rules of the Air (Rule 9(3)) however, since the Lynx had the PA28 on the right, it should have given way; this is dependent on both pilots seeing the opposing ac in good time.

In this case, however, the Board determined that the pilots of both ac had seen the opposing ac later than optimum and that this had been the cause of the incident. When assessing the degree of risk Members noted the PA28 pilot considered that maintaining his orbit would provide adequate separation. Although the Lynx pilot saw the PA28, albeit late at 500m distant, it was in time to effect successful avoidance. Members therefore agreed that there had been no risk that the ac would have collided.

## AIRPROX REPORT No 039/08

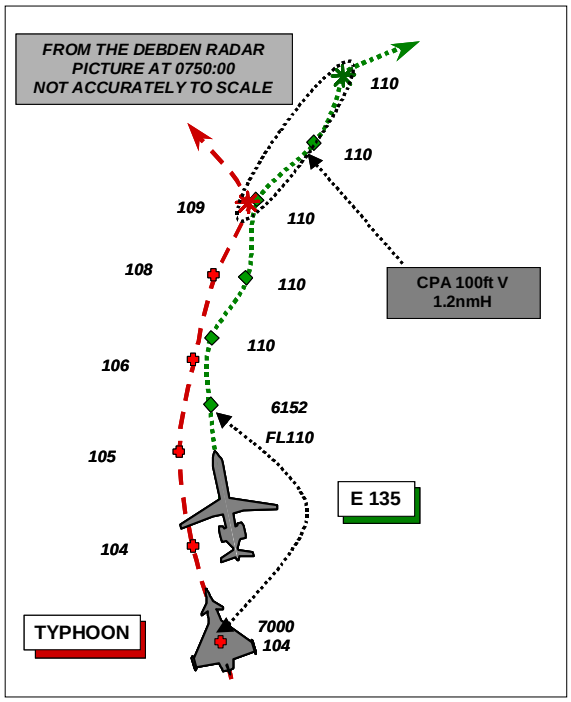
### PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Late sightings by the pilots of both aircraft.

Degree of Risk: C.

## AIRPROX REPORT NO 040/08

| | | |
|---|---|---|
| *Date/Time:* | 10 Apr 0750 | |
| *Position:* | 5245N 00100W | |
| *Airspace:* | London FIR | (Class: G) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | Embraer 135 | Typhoon |
| *Operator:* | CAT | HQ AIR (Ops) |
| *Alt/FL:* | FL110↑ | FL 110 |
| *Weather* | VMC CAVOK | VMC |
| *Visibility:* | >50nm | 30km |
| *Reported Separation:* | 0ft V/½nm H | 1000ftV/7500ft (1.25nm) H |
| *Recorded Separation:* | 100ft V/ 1.2nm H | |




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

**THE EMBRAER 135 PILOT** reports flying a scheduled passenger flight flying IFR from Norwich to Aberdeen squawking as directed with Mode C; TCAS was fitted. They were heading approximately 340° at 280kt and climbing towards NALAX [an upper air reporting point off Spurn Head] when Norwich APR gave them a heading change to avoid military traffic. A few seconds later, the contact appeared on their TCAS, climbing towards them from their 7 o'clock position. As they changed their heading the military contact also appeared to change it's heading correspondingly.

ATC then told them to stop their climb to allow the military ac to climb past them so the First Officer reduced the rate of climb (to almost zero at one point), at around FL105, to slowly capture FL110. According to their TCAS, it looked like the other ac did likewise and both eventually levelled at FL110 as the military ac continued to close in.

ATC continued to give them heading changes for avoiding action but it became apparent that the military ac was following them, settling in their 6 o'clock position at half a mile, and maintaining that position despite heading changes from 270 to 090°.

Eventually the military ac broke off and descended away from them. He assessed the risk as being low.

**THE TYPHOON PILOT** reports that he was flying a medium level tactical training sortie as a singleton, squawking 7000 with Mode C, but not in contact with any unit; TCAS was not fitted. While heading 030° at 306kt and conducting simulated air to surface attacks in East Anglia, he proceeded to investigate a radar track that was pointing directly into the area of his simulated target. As he approached the ac, heading 030° at 306kt, it turned to the N, into the area in which he was planning to operate. Whilst maintaining a radar track on the ac he continued to look for further suitable air to surface targets in his immediate vicinity. He continued to monitor the ac and continued to reduce the range to the ac and on realising that it was a civilian airliner he cleared away to the W. The closest that he came to the airliner was 7600 ft [1.25nm] behind the airliner and about 1000ft below. There was not at any time a risk of collision. However, due to the aspect of the airliner and the ambient conditions, his identification that the ac was an airliner was late.

He was informed that an Airprox was being filed on landing.

## AIRPROX REPORT No 040/08

**THE NORWICH CONTROLLER** reports that at 0744 an E135 departed Norwich [RW27] for Aberdeen. Departure instructions were passed to track to NALAX and climb to FL170. At the same time he saw a contact squawking 7000, about 30nm W of Norwich and maintaining FL150 steady on a track of 070°. As the E135 reached a point 10nm NW of Norwich, the ac squawking 7000 was descending but still steady on a track of 070°. He stopped the E135 at the next FL and passed avoiding action. The unknown track looked as though it would pass behind, but to make sure, he turned the E135 onto a heading of 270° to accelerate the pass. The 7000 squawk then turned left and began to formate on the Embraer [behind]. He passed a further series of avoiding action turns but they did not establish separation as the ac squawking 7000 continued to follow the Embraer and matched its level. The unknown track eventually broke away about 16nm NW of Norwich. London Mil eventually identified the unknown ac to them.

**THE TYPHOON UNIT** comments the pilot had awareness of the airliner throughout and has stated that had he been able to visually identify that the contact was an airliner earlier, then he would have hauled off sooner. There was no danger of collision between the ac at any point.

The lesson from this incident that has been identified and will be spread to all pilots at the unit, is that even when operating VMC in class G airspace it pays to have a radar service to give you that extra level of SA.

**ATSI** reports that the E135 departed Norwich and contacted Norwich APR, the crew reporting passing 2400ft in the climb to FL170 and tracking to NALAX; APR advised that they were identified and he would be providing a RAS. As the E135 progressed northbound, at 0746:30, a return from an ac (the subject Typhoon) squawking 7000 can be seen tracking eastbound in the E135's 10 o'clock at a range of 20nm. At this time the E135 was passing FL47 and the Typhoon indicating FL142 descending and, at 0747:40, APR instructed the E135 crew to squawk 6152 for London Mil, which was read back. APR then noted that the Typhoon had made a left turn towards the E135 and so he gave the E135 pilot an avoiding action right turn onto 020º. At this stage the E135 was passing FL94 with the Typhoon SW of it by 6.7nm, indicating FL99. APR passed TI and instructed the E135 crew to stop their climb at the next available FL and the crew advised that they had the other ac on TCAS and it was going to pass behind and that they would stop their climb at FL110. APR instructed the E135 crew to turn left heading 270º to accelerate the pass behind the E135 and the crew complied with this. However, the Typhoon turned to position itself south and behind the E135 at a similar level and slowly closed in.

APR passed further TI and instructed the E135 crew to turn right heading 360º. Shortly afterwards an avoiding action right turn onto 090º was passed as the Typhoon was approaching from the S and climbing up to the level of the E135, i.e. FL110. At 0749:10, the radar recording shows the Typhoon in the 6 o'clock of the E135 at a range of 2.6nm and 1100ft below the E135. Further TI was passed and APR asked the crew if they were visual. The response was that they couldn't see the traffic as it was behind them and they had it on TCAS. The Typhoon continued to close and climb until, at 0749:53, it was SW of the E135 by 1.3nm and 200 feet below. [Note: CPA 2 sweeps later 1.2nm and 100ft] The Typhoon then turned left and tracked away from the E135

**HQ AIR (OPS)** comments that the pilot was well aware of the restrictions on using civilian ac as simulated targets, and this was not his intent when he locked up this contact. I believe that his concentration was focused on searching for ground targets, and was keeping his SA on the Embraer using, mostly, the 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 video recordings, reports from the air traffic controllers involved and reports from the appropriate ATC and operating authorities.

The HQ Air (Ops) Member briefed the Board that despite the radar data since the Typhoon had been engaged on an air-to-ground training flight, it had not been his intent to intercept the airliner or indeed any other ac. That being the case, there had not been any breach of the regulations regarding air intercepts or any other HQ Air regulations as far as he was aware.

Although both ac were heading into the same section of Class G airspace at the same time and both had an equal right to operate there, the Board as a whole was very surprised that the Typhoon pilot had not recognised that the ac was a civilian airliner earlier and given it a significantly wider berth. One pilot Member suggested that the fact that the (small blue and white) airliner was of a similar colour and size to a large fighter ac might have misled him.

Notwithstanding that the Embraer did not receive a TCAS TA or RA, the flight path chosen by the Typhoon pilot made it impossible for the Norwich APR controller to provide any meaningful avoidance, despite his best efforts, let alone achieve the 5nm or 3000ft that he was required to attempt to provide against an unidentified contact. A military Member pointed out that this manoeuvring might have misled the Typhoon pilot into thinking the ac was military. Controller Members agreed however, that the Norwich APR had reacted entirely correctly in difficult circumstances.

When asked whether the Typhoon had an IFF interrogator, the HQ Air (Ops) Member said that in his view this was not relevant. This pilot was at a relatively early stage of conversion training, did not have an air defence background and therefore might not have been fully conversant with the ac systems; in any case, he would almost certainly not have recognised the SSR code as being allocated to London Military. The HQ Air (Ops) Member also pointed out that the Embraer had been squawking a London Military code in anticipation of a handover to them and, even if the Typhoon pilot had recognised the code, this might have mislead him into thinking that the ac was military and therefore an acceptable target.

Notwithstanding all these factors, the Typhoon had closed behind the airliner to a distance of 1.2nm, which caused both the Embraer pilot and the controller some concern. The Board was unanimous in its view that this had been an ill-advised manoeuvre but accepted that it had not been intentional. It was however, fortunate that the direction of approach of the Typhoon, its slow closure rate and its breakaway at 1.2nm were such that neither a TA nor an RA was triggered by the E135's TCAS the latter of which would have caused the Embraer pilot to conduct a rather more pronounced avoidance manoeuvre.

Since the Typhoon pilot had been in radar contact and then visual with the airliner throughout, the Board agreed unanimously that at no time had safety been compromised.

## PART C: ASSESSMENT OF CAUSE AND RISK

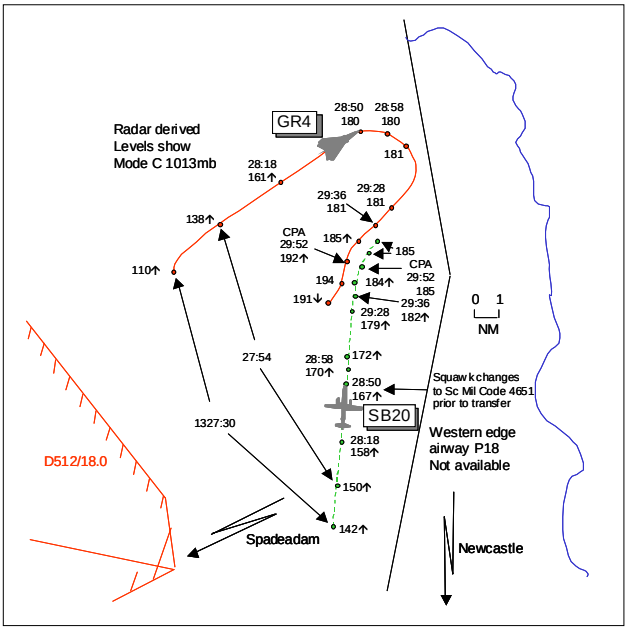
Cause: The Typhoon pilot consistently flew close enough to the E135 to cause its pilot and Norwich APR concern.

Degree of Risk: C.

## AIRPROX REPORT No 041/08

## AIRPROX REPORT NO 041/08

| | | |
|---|---|---|
| *Date/Time:* | 8 Apr 1330 | |
| *Position:* | 5527N 00150W (25nm NNW Newcastle) | |
| *Airspace:* | Scottish FIR | (Class: G) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | SAAB2000 | Tornado GR4 |
| *Operator:* | CAT | HQ STC |
| *Alt/FL:* | ↑FL185 | FL180↑ |
| *Weather* | VMC CLOC | VMC CLAC |
| *Visibility:* | >10km | >20nm |
| *Reported Separation:* | 800ft V/300m H | 1000ft V/1nm H |
| *Recorded Separation:* | 700ft V/0·7nm H | |




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

**THE SAAB2000 PILOT** reports enroute to Aberdeen IFR climbing to FL185 heading 010° at 260kt and in receipt of a RAS from Scottish Military squawking with Modes C and S. The visibility was >10km in VMC and the ac was coloured blue/white with anti-collision and strobes switched on. Immediately prior to transfer to Scottish Mil, Newcastle ATC advised them of military traffic tracking NE'ly below their level and for them to contact Scottish Mil. Whilst contacting Scottish Mil, the military ac was seen on TCAS to climb and turn R to track SW'ly. The controller told them *"avoiding action turn left"* at which time they were visual with a Tornado ac, about 5nm away in their 1230 position crossing/ converging from R to L. A L turn would have put their ac into the Tornado's flight path so they turned R to avoid it, keeping it in sight at all times with a "TCAS Descend" RA being generated as it crossed ahead before passing 800ft above and 300m clear on their L. He assessed the risk as medium.

**THE TORNADO GR4 PILOT** reports conducting an Operational Test and Evaluation sortie to the N of Newcastle and in receipt of a RIS from Scottish Military on 282·625MHz squawking 4626 with Mode C. The visibility was >20nm flying 5000ft above cloud in VMC and the ac was coloured grey with anti-collision and HISLs switched on. As part of the sortie, numerous test runs were required at differing heights approximately 30-50nm NE of Spadeadam. About 2min prior to the Airprox, he commenced a climb from FL130 to FL180 heading 230° and 30sec later at 1327:52 he was told of traffic bearing SE range 11nm N'bound FL150 climbing. By now he had turned onto heading 050° passing FL150 at 360kt before levelling at FL180, then informing Scottish at 1328:45 that he was turning back towards Spadeadam. Ten seconds later a garbled transmission was received stating traffic at FL160 followed at 1329:33 that it was SE range 4nm FL180 climbing N'bound. Flying into sun at 420kt the traffic was seen immediately, a low wing twin engine passenger ac about 500ft below and 5nm away, and he called 'visual' to Scottish whilst simultaneously making a climbing turn to increase separation, passing 1000ft above and 1nm in front of the other ac. He assessed the risk as low.

**ATSI** comments that the SB20 departed Newcastle and contacted the Newcastle APR at 1322. The crew reported passing 2800ft for 6000ft and were instructed to climb to FL120. This was acknowledged and the crew requested an early turn to avoid weather, which was approved. Although no level of service was requested by the pilot, or offered by the controller, the APR later stated that he was applying a RAS.

As the SB20 left the northern edge of the Newcastle CTR, at 1325:25, it was passing FL99 and the Tornado was 20nm NNE, indicating FL100 and tracking SW. The APR passed TI as "*… military traffic crossing right to left in your 1 o'clock range 15nm at FL100*". The SB20 crew requested further climb and in response to a query from the APR advised that their requested cruising level was FL185. At 1326:20, they were instructed to climb to FL185. At the time this clearance was issued, the Tornado was 14·1nm due N of the SB20 and turning R through W.

At 1327:30, further TI was passed to the crew of the SB20 on the Tornado, which was in their 10 o'clock range 12·6nm and in a R turn passing through N. The SB20 was passing FL142 climbing and the Tornado was indicating FL110 climbing. The Tornado then rolled out on a NE'ly heading and further TI was passed at 1328:25 *"SB20 c/s this traffic appears to be continuing the climb and the northeasterly heading he is well clear in your 12 o'clock at 12 miles"*. As it crossed from L to R through the 12 o'clock of the SB20, it was indicating FL180 and 11·2nm from the SB20. At 1328:36 the APR instructed the SB20 crew to change squawk to 4651 for Scottish Military. The SB20 crew were instructed to change frequency, the readback of the transmission ending at 1329:00. However, after this instruction had been passed and acknowledged, the Tornado is seen to make a R turn eventually rolling out on a SW'ly heading. It then crosses from R to L through the 12 o'clock of the SB20 by which time it is believed that the crew of the SB20 were in contact with Scottish Military.

**MIL ACC** comments that the Tornado GR4 was conducting an Operational Test and Evaluation sortie N of Newcastle under a RIS from Scottish Military on frequency 282·625MHz. The test required numerous runs to be conducted at various heights approximately 30–50nm NE of Spadeadam Range remaining in Class G airspace. The SB20 had been pre-noted to Scottish Mil Controller 5 (SM5) by Newcastle (NEW); a squawk and frequency had been issued to NEW by Scottish Mil. The SB20 was transiting from Newcastle to Aberdeen under a RAS in Class G airspace climbing to FL185. The GR4 was flying VFR whilst the SB20 was flying IFR but both pilots report flying in VMC with visibility in excess of 10km. SM5 had been on console for 25min and assessed the workload as medium; the Scottish Mil Supervisor (Sup) was nearby.

RT tape transcripts were not available from Scottish Mil. Therefore, unless otherwise stated, all timings quoted have been taken from the radar replay supplied by the Radar Analysis Cell SM5 was receiving a handover from a military terminal unit when the SB20 flight called on frequency 134·475MHz. The SB20 changed to its assigned Scottish Mil squawk at 1328:50 indicating FL167 climbing to FL185. At this time the GR4 was R 1 o'clock at 10nm tracking 060° climbing. At 1328:58 the GR4 is seen to be in a RH turn passing FL180 whilst the SB20 was passing FL170 climbing. SM5 reports that when the SB20 flight called, the GR4 was R 1 o'clock at approximately 3nm. Analysis of the radar replay places this event at 1329:36, 47sec after the squawk change. At this time, the GR4 is indicating FL181 and the SB20 is indicating FL182 climbing. SM5 issued an avoiding action turn to the SB20 of L 270° which was a reasonable judgment given the relative positions of the subject ac. However, the GR4 continued its RH turn so SM5 changed the avoiding action turn to R 090°. The SB20 is seen to initiate a RH turn at 1329:52 which is the time of the CPA. The Mode C of both ac are garbled due to their close proximity. However, SM5 and the Supervisor state in their reports that vertical separation at this point was 700ft.

Meanwhile, the controller of the GR4 had been passing TI on the SB20; at least 3 times including FLs [timings stated in GR4 pilot's report] and that the traffic was climbing. The GR4 pilot reports that at 1329:35 [timing from pilot report] he reported visual with the SB20 to Scottish Mil whilst at the same time making a [rapid] climbing turn to increase separation. The SB20's Mode C indicated that the flight did not descend at any point but continued to climb to FL185. The GR4 pilot assessed that he passed > 1000ft above and >1nm ahead of the SB20. The radar replay shows a CPA of 0·7nm and vertical separation as 700ft. Once both ac had passed each other, they continued without further incident.

The controller of the GR4 complied with the rules of RIS in that TI was passed and updated until the confliction was resolved. The GR4 had been flying a NE/SW profile throughout the Air Test at various FLs. The SB20 was transferred to Scottish Mil whilst in confliction with the GR4 flight profile. No liaison was initiated either to coordinate the SB20's transit or suggest an alternative flight path.

**HQ AIR (OPS)** comments that this incident took place whilst both ac were receiving a radar service. The TI passed resulted in them both gaining visual and avoiding – as designed.

## 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 MIL ACC Advisor expressed regret for the lack of reports and RT transcripts from ScATCC Mil. He advised that a process has been put in place to stop a reoccurrence in future.

ATCO Members initially discussed the controllers' roles in the incident and agreed that the timing of the Newcastle APR's transfer of the SB20 to SM5 was unfortunate but understandable. At the time, the GR4 was fast moving traffic and heading away from the airliner so the APR had no reason to 'hang-on' to the SB20. It was only after this transfer had occurred that the GR4 turned R, back towards the SB20 and into confliction. One Member opined that although SM5 had been pre-noted and would be expecting the SB20, the controller appeared to be unaware of the GR4 working the same unit as himself in the area ahead of the SB20; early inter-unit coordination could have been effected to resolve the situation. Similarly, had the Newcastle APR noticed the GR4's racetrack patterns earlier, a handover or coordination prior to transferring the flight might also have helped. Immediately prior to transfer, Newcastle gave the SB20 flight updated TI on the GR4 and after the SB20 crew called on SM5's frequency, the controller had immediately issued an avoiding action L turn which, at the time, seemed to be the most appropriate course of action. Both flights had received accurate and timely TI, which, when combined with the SB20 crew's TCAS contact on the GR4, had enabled both crews to visually acquire each other's ac and to avoid. Members agreed that all parties had acted responsibly and that the circumstances had led in a conflict in Class G which had been resolved by both crews. Pilot Members opined that owing to the geometry that pertained and the GR4 pilot's robust actions, the TCAS RA generated on the SB20 would have been brief as the GR4 crossed quickly ahead and well clear above. These visual sightings and subsequent actions taken by both crews allowed the Board to conclude that any risk of collision had been effectively removed.

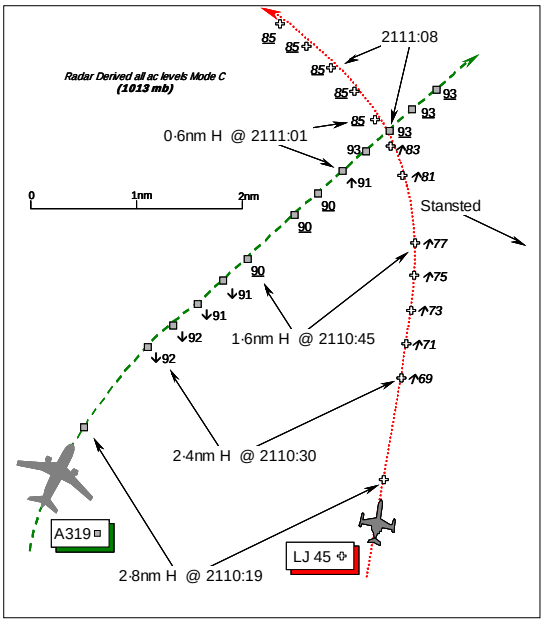
## PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in Class G airspace resolved by both crews.

Degree of Risk: C.

# AIRPROX REPORT NO 042/08

| | | |
|---|---|---|
| *Date/Time:* | 11 Apr 2111 | Night |
| *Position:* | 5155N 00003E (4nm S of BARKWAY) | |
| *Airspace:* | London TMA | (Class: A) |
| *Reporter:* | Stansted APR | |
| | *1st Ac* | *2nd Ac* |
| *Type:* | A319 | Learjet 45 |
| *Operator:* | CAT | Civ Comm |
| *Alt/FL:* | FL90 | ↑FL85 |
| *Weather* | VMC NR | IMC In rain |
| *Visibility:* | 10nm | 10km |
| *Reported Separation:* | | |
| | 600ft V/1m H | 600ft V/1m H |
| *Recorded Separation:* | | |
| | 600ft V/0·6nm H | |




## PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

**THE LTC STANSTED APPROACH RADAR CONTROLLER (ESSEX RADAR)** reports that the Learjet 45 (LJ45) departed Stansted under IFR on a BUZAD 6R departure, outbound for Liverpool. Initial contact from the LJ45 crew was flawed as none of the required information was reported and the crew had to be prompted to provide this. The LJ45 crew was subsequently given a climb to FL80 under a RCS; he believed this was read back correctly and that the ac's Mode S selected flight level (SFL) indicated FL80 [which it did]. The A319 was inbound to Stansted via BARKWAY under RCS descending to FL90 and the crew assigned a heading of 050°. As he could do nothing else until the flights had crossed one another he diverted his attention elsewhere. He was then surprised to hear "TCAS climb" which, he believed, to be from the A319 crew. The SSR labels on both the A319 and the LJ45 started to flash Red, as they garbled, but he still could see the SFL's of their respective Mode S displays. To the best of his recollection, they both correctly showed FL80 for the Learjet and FL90 for the A319. He asked the LJ45 pilot to confirm that he was maintaining FL80 but he replied that he had to climb in response to TCAS. There was no traffic in the vicinity below the level of the LJ45 that might have resulted in such a manoeuvre. He believes that vertical separation was eroded to 600ft.

**THE A319 PILOT** reports that he was inbound to Stansted and in receipt of a RCS from ESSEX RADAR on 120·625MHz. Heading 050°(M) passing W abeam Stansted at 220kt, level at FL90 in VMC, a Learjet 45 that had been cleared to FL80 crossed ahead as it climbed to FL84. TCAS had enunciated a TA at –2100ft before an RA CLIMB was triggered to remain clear of the LJ45. They ascended to FL94 to remain clear of the LJ45 which passed some 600ft beneath his ac as it passed from R – L about 1nm ahead with a *"low"* risk of a collision. After the conflict was resolved they returned to level flight at FL90 and executed a normal approach and landing.

UKAB Note (1): The LTC unit report revealed that in a subsequent telephone call to the LTC Watch Supervisor, the A319 pilot had advised that they were visual with the LJ45 throughout this event.

**THE LEARJET 45 (LJ45) PILOT** reports he departed under IFR from Stansted on a BUZAD 6R SID for Liverpool in receipt of a 'radar' service from ATC on frequency 120·625MHz. Flying in IMC in rain, ATC instructed them to climb to FL80. There was inbound traffic to Stansted Airport descending to FL90 – the A319 – 1000ft above them.

Shortly afterwards the A319 crew reported a TCAS RA CLIMB on RT. The controller asked them [the LJ45 crew] to confirm that they were maintaining FL80 and they replied that they had climbed in response to TCAS. As their LJ45 climbed to FL85, separation was lost against the A319.

UKAB Note (2): In addition to the foregoing LJ45 pilot's report, the company submitted additional comment to the ANSP that was included within the unit's report:

"The crew recognises the mistake. By the time that the crew received the TCAS RA warning they were climbing with too high [a] vertical speed. Their first interpretation [of the TCAS RA] was that they needed to CLIMB to avoid the other traffic. They disengaged the auto-pilot and continued to climb until they realised that they should have adjusted the rate of climb instead of climbing. By the time they started correcting the error, they had already passed FL80 and were reaching FL85 before they immediately corrected to their assigned level.

In order to avoid similar situations in the future, the company has instructed all pilots not to use rates of climb above 2000ft/min inside terminal areas unless instructed to do so by ATC."

UKAB Note (3): Met Office archive data gives the 2120UTC METAR for Stansted as: S/W 200/07kt; Visibility >10km; Cloud FEW040; QNH 1000mb.

**ATSI** reports that the LJ45 departed from RW23, the crew calling the Stansted ESSEX RADAR controller at 2108:25. Although the crew reported *"..just airborne"* they were passing 2000ft for 3000ft and had to be prompted by the controller for their passing level and their cleared level as well as the SID they were following. This was provided and the controller requested that the crew squawk ident, which they did.

At 2109:10, the controller instructed the crew to climb to FL80 which was correctly read back. At this time the LJ45 was just commencing a R turn in accordance with the BUZAD 6R SID and was 7·4nm ENE of the A319. The A319 crew called at 2109:55 and reported descending to FL90. The controller instructed the A319 crew to turn R heading 050º and advised that they were number 2 in the traffic sequence for RW23 and they were 31nm from touchdown. At this time the A319 was passing FL98 and the LJ45, which was passing 4400ft, was in its 3o'clock at a range of 3·5nm. At 2110:18, STCA activated at low severity between the two ac when they were 3nm apart - the A319 was 3900ft above the LJ45. At 2110:30, the controller instructed the LJ45 crew to turn L heading 305º, it being in the A319's 2o'clock at 2·4nm passing FL69 for FL80, whilst the A319 was passing FL92 in descent for FL90.

At 2110:54, the A319 crew reported a TCAS CLIMB and 3sec later STCA changed to 'high severity'. Analysis of the radar recording shows that the LJ45 continued through FL83 as it crossed from R - L through the 12 o'clock of the A319, reaching a maximum level of FL85. Separation reduced to 0·6nm and 600ft.

When the A319 crew reported their TCAS climb, the controller acknowledged this before instructing the LJ45 crew to maintain FL80. The crew replied *"…we climb the 5 hundred feet more because we have a TCAS advisory and we need to adjust and now descend flight level 8-0"*.

UKAB Note (4): ASSESSMENT OF TCAS PERFORMANCE - NATS Systems Safety Department helpfully conducted a TCAS simulation of this event using the InCAS simulator. Depending on the location of the Airprox and its proximity to ground-based Mode S monitoring devices, down-linked Mode S data can also be presented to reinforce the simulation data and is included here. There is no evidence to suggest that the NATS TCAS simulation of these events using this standard simulation device was in error.

The simulation indicates that both crews were issued with TCAS TAs at 2110:31, as the LJ45 climbed through FL70 and the A319 descended through FL92 at a range of 2·29nm. As the LJ45 continued to climb through FL76 and separation reduced to 1·67nm and 1451ft, the LJ45's crew was issued with an "ADJUST VERTICAL SPEED" RA at 2110:42 instructing the pilot that the LJ45's ROC should not exceed 500ft/min. The simulation indicates that at the time of the RA, the LJ45 was climbing at ~3000 ft/min. At 2110:47, the LJ45 triggered a "CLIMB" RA on board the A319 which had already levelled off at FL90. As the A319 crew began to climb in response to the RA the LJ45 began to level at about FL85 and the A319 RA weakened to an "ADJUST VERTICAL SPEED" RA against the LJ45 that was 733ft below, instructing the A319 crew that the ac should not descend. This was shortly followed by the "CLEAR OF CONFLICT" message at 2111:06 to the crew's of both ac, as the A319 reached FL92.

In addition to the simulation, the radar replay indicates that as the LJ45 was climbing towards FL80, the ac's ROC was +3500 ft/min. This ROC reduced slightly as the LJ45 passed FL70 but at FL77 – with only 300ft to go their cleared level of FL80 - Mode S data indicates that the ac was still climbing at a ROC of 2624ft/min.

## PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

This was the third such Airprox considered by the Board within the last year where a crew's inappropriate response to an RA had given cause for concern. The Board was briefed that an analysis of the radar recordings had shown that no other traffic was evident in the vicinity of the LJ45, reinforcing the controller's account that there was no other ac around that might have induced a CLIMB RA in the LJ45. Furthermore, the NATS Ltd Advisor reaffirmed the findings of their analysis of the TCAS event intrinsic within this Airprox.

It seemed from the outset that the LJ45 crew were working hard as they climbed away from Stansted for the ATSI report revealed that they had to be prompted by the controller for initial departure details. It was clear that the ESSEX RADAR Controller had ensured that standard vertical separation of 1000ft would be maintained beneath the A319 and the departing LJ45 until horizontal separation was established after they had passed each other. However, this was thwarted when the latter's crew climbed above their assigned level of FL80. In general terms, pilots should take care when climbing up beneath other traffic as a relatively high RoC can induce an unwarranted TCAS RA in other ac above them. Members especially stressed the importance of moderating rates of climb when approaching an assigned level in the terminal area. Here, pilot Members agreed with the LJ45 company's view that the ac was being climbed at an excessive rate in the TMA as they approached their cleared level of FL80: with only 300ft to go the ac was still climbing at a rate of 2624ft/min the recorded Mode S data for that instant had revealed. It was clear from the company's comment that the autopilot was dis-engaged at the critical moment, a controller Member commenting that a 'level bust' was always 'on the cards' at this RoC. However, a very experienced CAT pilot Member was of the opinion that the A/P would have been able to cope and might well have been able to level the ac at FL80 if it had not been dis-engaged.

The very short report from the LJ45 pilot did not provide the Board with much detail as to what was happening in the LJ45's cockpit. It was evident to the Board that the crew had misunderstood the response required to the ADJUST VERTICAL SPEED RA generated as a result of their high RoC and the presence of the A319 above them. The exact nature of the presentation of the TCAS data on the LJ45's cockpit display was not clear from the pilot's very limited account and no mention was made of the pilots checking their VSI, which should have indicated exactly what they had to do to comply with the RA. A CAT pilot Member stressed the importance of this visual check on what the RA required, over and above the aural enunciation of ADJUST VERTICAL SPEED. As it was, the comprehensive TCAS analysis, coupled with the recorded Mode S data, had allowed the Board to readily assimilate what should have been displayed to the LJ45 crew and the radar recording had revealed the geometry of what had actually transpired during this period. Many pilot Members were of the opinion that if the LJ45 crew had climbed at a more moderate rate to their cleared level this RA would not have been triggered. Clearly the LJ45's TCAS did not know their assigned level was at FL80: hence, their TCAS independently perceived that if the ac's rapid RoC remained unchecked then a conflict would ensue with the A319. As it was, all that was needed was to reduce the RoC into the green sector to forestall any further difficulty but for whatever reason the LJ45 crew did not recognise this at the time. Thus the LJ45 was climbed above the cleared level of FL80 – that had been read-back correctly – thereby inducing a concomitant reaction in the A319's TCAS, also to climb. Members agreed unanimously that this Airprox had resulted because the LJ45 crew misinterpreted their TCAS RA and maintained their rate of climb, taking them above their cleared level into conflict with the A319.

Turning to the risk inherent here, the A319 crew were merely complying with the ESSEX RADAR controller's instruction to maintain FL90 when TCAS enunciated their CLIMB RA. The radar recording evinced that vertical separation was still 700ft, as the LJ45 crossed ahead of the A319. On the next sweep it was evident that the A319 was climbing steadily through FL91 as the CPA of 0·6nm was reached and the LJ45 had just levelled at FL85. Therefore, despite the LJ45 crew's excursion by some 500ft above their assigned level, vertical separation was not eroded to less than 600ft at this point. Indeed the A319 crew's compliance with the CLIMB RA ensured that 800ft of separation was achieved very shortly afterwards and by this time the LJ45 was clearing to port of the airliner. Moreover, the A319 crew were apparently visual with the LJ45 throughout and could have taken more robust avoiding action if needs be. Thus despite the LJ45 crew's incorrect initial response to their RA, in the Board's view no actual risk of a collision existed in these circumstances.

## AIRPROX REPORT No 042/08

The Board was briefed by the NATS Ltd Advisor that this Airprox will be used as an example of a crew's incorrect response to an ADJUST VERTICAL SPEED RA when briefing company flight safety representatives within the TCAS Working Group.

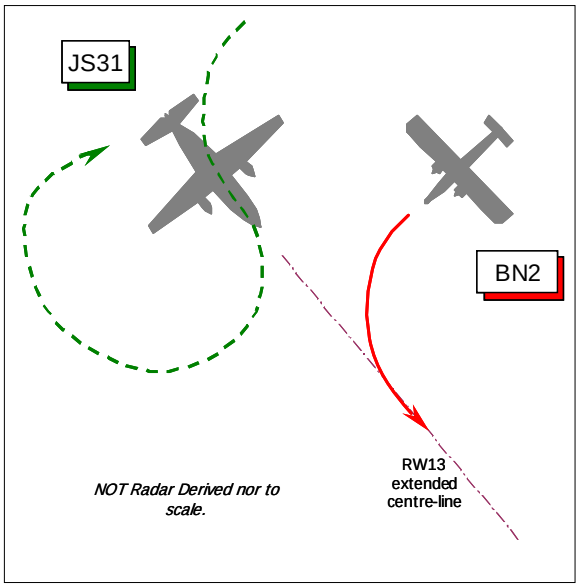
### PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The LJ45 crew misinterpreted their TCAS RA and maintained their rate of climb, taking them above their cleared level into conflict with the A319.

Degree of Risk: C.

# AIRPROX REPORT NO 043/08

| | | |
|---|---|---|
| *Date/Time:* | 16 Apr 1326 | |
| *Position:* | 5026N 00407W (Plymouth Airport cct - elev 476 ft) | |
| *Airspace:* | Plymouth ATZ/FIR | (Class: G) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | Jetstream 31 | Islander BN2 |
| *Operator:* | CAT | Civ Comm |
| *Alt/FL:* | 2000ft↓ | NR |
| | QNH (1016mb) | QFE (998mb) |
| *Weather* | VMC NR | VMC CAVOK |
| *Visibility:* | 10km+ | 30nm |
| *Reported Separation:* | | |
| | 500ft V/800m H | NR |
| *Recorded Separation:* | | |
| | Not recorded | |




## PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

**THE BAe JETSTREAM 31 (JS31) PILOT** reports he was inbound to Plymouth Airport under IFR, but had elected to execute a visual approach to RW13 in VMC. He was in communication with Plymouth APPROACH on 133·55MHz and in receipt of, he thought, a FIS. A squawk of A4551 was selected with Mode C on; TCAS is fitted.

Aware of the presence of the BN2 whilst he was inbound on L base for RW13 heading 210°(M) at 140kt the Islander was first sighted about 1nm away turning finals ahead of his ac. No RT calls had been heard from the BN2 crew whom had been instructed by ATC to report DOWNWIND but did not do so. Both he and his co-pilot had lost sight of the Islander prior to entering the cct as the other ac drew astern. Descending through 2000ft QNH (1016mb), they assessed the situation and elected to instigate a RHD orbit on finals to allow the BN2 time to land, backtrack and clear the RW. He assessed the Risk as *"high"* and estimated the BN2 was 500ft below them and 800m away at the closest point. No TA or RA was enunciated, neither was any Mode C evident from the BN2 as there was no contact displayed by their TCAS.

He added that ATC seemed confused over their flight rules, but they were IFR.

**THE ISLANDER BN2 PILOT** reports they were inbound to Plymouth and in receipt of an ATS from Plymouth TOWER. SSR with Mode C was selected on. Approaching to land on RW13 at 90kt, the JS31 had been seen from 5nm away, but they had no idea that the JS31 crew had kept their closing speed high on their visual approach which the JS31 pilot had accepted from ATC. After joining the circuit [DOWNWIND LEFT HAND] and calling normal circuit positions, the JS31 was last seen as they turned finals, when the JS31 was about 3nm away. They had no idea that they had upset the JS31 crew's final approach as the JS31 was on BASE-LEG.

He opined that the JS31 crew seemed to be under the impression that they were still IFR.

**THE PLYMOUTH COMBINED APPROACH/TOWER CONTROLLER (TWR)** reports that the IFR JS31 flight was cleared for a visual approach to RW13 and given traffic information on the VFR Islander BN2 that was conducting a training flight to the E and NE of the airfield. The BN2 crew reported ready for recovery to Plymouth and was told to join DOWNWIND LHD for RW13 and given traffic information on the JS31. He then asked the JS31 crew if they were visual with the BN2 and the JS31 pilot reported that they were.

The BN2 crew's first report in the cct was turning LEFT BASE, no DOWNWIND report was given and the crew was instructed to report FINALS. The JS31 crew was asked if they were visual, said that they were and would widen their approach. Both ac landed.

Subsequently the JS31 Captain, came up to the Tower to advise that he was not happy with the separation and would be filing an Airprox.

One of the Islander pilots - a lady – [actually the co-pilot] said she was busy whilst under instruction and forgot to report DOWNWIND. She was advised that the Captain of the JS31 was filing an Airprox.

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

**ATSI** reports that the BN2 was on a VFR training exercise in the Plymouth area and in communication with Plymouth combined APPROACH/TOWER (TWR) on 133·55MHz. (Plymouth ATC is not equipped with radar.) At 1308 [about 18min before the Airprox occurred] the controller asked the BN2 crew for their position and altitude. The crew reported at 2900ft, just coming up to the extended centreline RW13 and the radar photograph shows the BN2 approximately 4nm ESE of the airport.

The JS31, operating on an IFR flight, established communication with TWR at 1320, reporting descending to FL40, direct to the PY, which is situated on the airport. The aircraft was cleared to the PY at FL35, to report either visual or approaching the PY. Traffic information was passed about the BN2: *"traffic is an Islander operating to the northeast of Plymouth up to 3 thousand feet on the Wessex* [RPS] *1-0-1-1"*. The pilot replied *"That's copied we'll keep a good lookout"*. Information was then issued to the BN2: *"traffic is a Jetstream to the northeast of Plymouth inbound to Plymouth IFR for recovery via the Papa Yankee"*. The BN2 pilot responded at 1321:00, *"copy that sir we're on an east to west run now and this is final we'll be coming in for fuel"*. Shortly after 1321:30, the JS31 crew reported "[C/S] *visual"* (at a range of approximately 14nm). Whereupon the controller instructed the JS31 crew that they were "[C/S] *clear for a visual approach to runway 1-3 report left base…"*. The JS31 crew replied at 1322:00, *"….we'll call you visual for a left base for..1-3* [C/S]*"*. In view of this transmission the controller checked whether the JS31's pilot was visual with the Airport now and this was confirmed. The QNH (1016mb) and QFE (998mb) were then issued and the JS31 pilot was informed *"…no circuit traffic"*. At that point the BN2 was about 6nm E of the airport, in a L turn, to head W.

At 1323, the BN2 crew transmitted *"we're just about 3 miles east of you now we'd like to descend please to join the circuit"*. The controller cleared the BN2 to *"join Downwind left hand for 1-3 the QFE 9-9-8 millibars"*. The pilot replied *"we're descending DOWNWIND for 1-3"*. From the RTF recording, this transmission could be construed as a DOWNWIND call. However, the co-pilot of the BN2 stated [to the controller in the VCR afterwards] that no DOWNWIND call was made and the controller did not understand this to be a cct position report. Traffic information to the subject ac was not updated. The controller's plan was to orbit the BN2 when the pilot reported DOWNWIND and then to position it behind the JS31. However, believing that no DOWNWIND call was received this action was not taken. The next call from the BN2 [transmitted simultaneously with that of another flight] at 1324:30, was "[C/S] *turning..on to LEFT BASE"*, whereupon the BN2 crew was instructed to report FINAL. Then the JS31 pilot was asked if he was visual with the BN2 on LEFT BASE, he replied *"Yeah we were turning LEFT BASE for now we're widening it out we are visual with him"*.

[UKAB Note (2): The BN2 was cleared to land after 1325 and later the JS31 crew reported *"..now LEFT BASE"*. The controller advised that the JS31 was now No2 in the landing sequence to the BN2 and to report FINAL, whereupon the JS31 responded at 1326:00 *"number 2 to the Islander we'll call you FINAL is he ..on the ground.."*. However the controller advised *"no, he's..about half a mile FINAL now".* Hearing this the JS31 crew advised *"ah I've got him visual* [C/S]" and added *"..we need one right hand orbit for spacing"*, which was approved by the controller. The JS31 crew subsequently reported *"FINAL 2 miles"* and was cleared for landing on RW13 just before 1329.]

In accordance with MATS Part 1, there is no requirement to separate IFR and VFR flights operating in Class G airspace. (Plymouth airport is situated outside CAS.) Section 2, Chapter 1, Page 1 states the responsibilities for Aerodrome Control. Of relevance to this Airprox:

*"Aerodrome Control is responsible for issuing information and instructions to aircraft under its control to achieve a safe, orderly and expeditious flow of air traffic and to assist pilots in preventing collisions between: a) aircraft flying in, and in the vicinity of, the ATZ".*

The controller did issue traffic information to both flights but this occurred before the BN2 was cleared to enter the cct. This additional information was not passed to the JS31 pilot. The controller expected a DOWNWIND call from

the BN2 crew, before enacting his plan to orbit the BN2 to position it as No 2 to the JS31, although he had not specifically asked the pilot for this report. He commented that he was occupied with traffic operating on the airport at the time and did not notice the BN2 fly downwind.

It is understood that the procedures for IFR aircraft on visual approaches to Plymouth Airport are being reviewed locally.

## PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The ATSI report had made clear the limit of the combined APPROACH/TOWER controller's responsibilities for the separation of mixed traffic IFR and VFR flights, as here, in Class G airspace. Whilst the JS31 pilot had reported he was inbound on an IFR FPL, it was clear that he had been offered, and had accepted, a *visual* recovery to the airport in the prevailing good weather conditions. Contrary to the BN2 pilot's belief at the time, the JS31 crew had not cancelled their IFR FPL and it was, the ATSI Advisor stressed, still technically an IFR flight even when executing a visual recovery.

When the JS31 crew commenced their visual join for RW13 there was, as correctly reported to them by TWR, no other cct traffic. However, it was evident that this information was not updated by the controller when the BN2 subsequently joined the cct LHD downwind. Neither was the BN2 crew updated by TWR when they reported rejoining the cct for fuel, as the JS31 was now joining on a visual L BASE-LEG, the Islander crew being advised earlier that the airliner was making an approach via the PY. Nevertheless, it was clear to the Members from the JS31 pilot's account that he was aware that the other ac was joining the cct downwind, although he perceived that the BN2 crew had not reported their cct position by making an appropriate DOWNWIND call. It was readily apparent to the Board that much of this Airprox hinged on the cct RT calls made by the BN2 pilots after they reported to the controller their intention to join downwind. The Board was briefed that in a telephone call with UKAB staff the BN2 pilot had asserted that all appropriate circuit RT calls had been made. However, during a discussion with the BN2 co-pilot, after the event, reported by the TWR controller, the latter declared that she had said no DOWNWIND call had been made. Some pilot Members were in a quandary over this point as the RT transcript had revealed that after the controller cleared the BN2 to *"..join downwind left hand for 1-3.."*, the BN2 pilot replied *"we're descending DOWNWIND for 1-3"*. The ATSI report had highlighted that this transmission could indeed be construed as a DOWNWIND call but it seems that the controller in the VCR did not understand it to be such, intending as he was to base his traffic pattern on this call in order to orbit the BN2 and allow the JS31 in ahead as No 1 in traffic for landing. Most Members agreed that this was unlikely to be a proper cct position report, but an experienced CAT pilot was not convinced. However, it was clear to all Members that this call was not taken as such by TWR and thus with the BN2 approaching the FINALs turn apparently unseen by the controller (the Control Tower faces the aerodrome, thus the LHD cct pattern results in the DOWNWIND leg being behind the controller as he faces RW13), TWR was unable to effect his planned orbit instruction in time before the BN2 had continued all the way to LEFT BASE, effectively without permission. This was unfortunate and clearly the JS31 crew had similarly continued into LEFT BASE and thence onto FINALs only to find out that the BN2 was in between them and the runway. Whilst unseen at that juncture, it was not for long. Some Members questioned whether the BN2 crew had integrated correctly into the cct as the controller expected a DOWNWIND call from them before enacting his plan to orbit the BN2 to position it as No2 behind the JS31. As it was, TWR realised that the BN2 was closer to FINALS and elected to change his plan and make it No1 to land, ahead of the JS31 whose crew was instructed to follow as No2. This was not an ideal situation but it worked. Pilot Members recognised that the JS31 crew might have felt aggrieved and perceived that the BN2 had cut in front of them and baulked their approach but controller Members pointed out that it was a visual cct and sometimes pilots do not do as expected and thus others might expect to receive short notice changes of plan. However, the RT transcript reveals that when the JS31 crew was advised that the BN2 was *"..about half a mile FINAL now",* on hearing this the JS31 crew spotted the BN2 and advised *"..I've got him visual* [C/S]" whereupon the JS31 captain elected to fly one right hand orbit for spacing, to which TWR agreed. Thus it transpired that the JS31 spotted the BN2 ahead and wisely elected to orbit once on FINAL for spacing against the BN2. The Board concluded therefore, that any conflict that might have occurred was effectively resolved by the JS31 pilot who acted sensibly in the changed circumstances. The Members agreed that this Airprox had resulted from a sighting by the JS31 crew of the BN2 on FINALS. Moreover prompt and effective action had been taken by the JS31 Captain, not only to ensure that his ac remained at a suitably safe distance from the other, but also allowing sufficient separation for the BN2 to backtrack and clear the

RW. Consequently, in the Board's view, following this sighting no risk of a collision had existed in the circumstances conscientiously reported here.

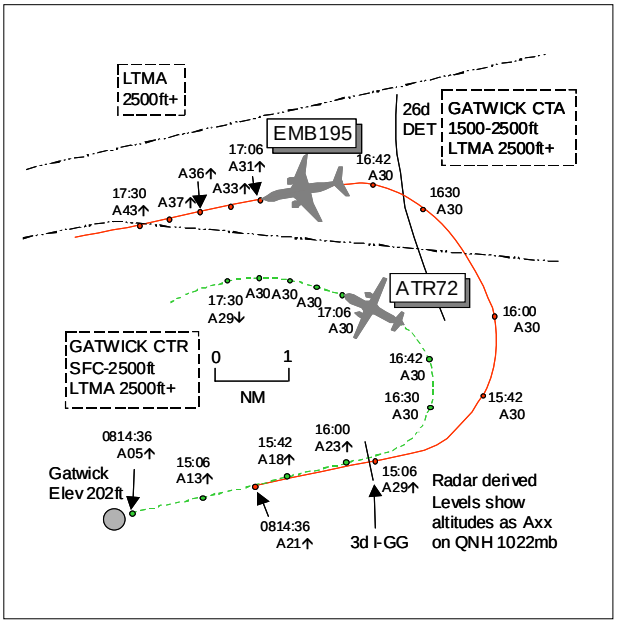
**PART C: ASSESSMENT OF CAUSE AND RISK**

Cause: Sighting report.

Degree of Risk: C.

# AIRPROX REPORT NO 044/08

| | | |
|---|---|---|
| *Date/Time:* | 16 Apr 0817 | |
| *Position:* | 5112N 00010W (4nm NE Gatwick - elev 202ft) | |
| *Airspace:* | LTMA | (Class: A) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | ATR72 | EMB195 |
| *Operator:* | CAT | CAT |
| *Alt/FL:* | 3000ft (QNH) | NR (QNH) |
| *Weather* | VMC NR | NK |
| *Visibility:* | >10km | |
| *Reported Separation:* | Nil V/2nm H | NR |
| *Recorded Separation:* | Nil V/1·9nm H OR 1400ft V/1·4nm H | |




## PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

**THE ATR72 PILOT** reports outbound from Gatwick IFR and in receipt of an ATS from Gatwick Tower on 124·22MHz squawking with Mode C. Flying a SAM 3P SID in accordance with SOPs and during a level turn at 220kt and 3000ft QNH, TCAS proximate traffic was seen visually at the same altitude. They queried the separation with Tower who responded *'fly heading 280 degrees'* which was a small turn from their heading of 290°. Shortly after this, a different controller told them *'heading 250 degrees'* followed by an instruction to *'descend'*. Immediately following the readback the controller then instructed them to *'maintain 3000ft'* but by this time the PF had disconnected the AP and started a descent; the ac descended to approximately 2800ft before returning to 3000ft. ATC told them to continue heading 250° and maintain 3000ft and that the traffic was now more than 1000ft above them. No TCAS TA or RA warnings were received and he estimated that minimum horizontal separation was 2nm when both ac were at the same level. He assessed the risk as low. The crew also filed a wake turbulence report for this incident where moderate turbulence was encountered at 1000ft followed by a rapid 30° roll to the R and a 10° heading change.

**THE EMB195 PILOT** reports that ATC told them to climb expeditiously as an ATR72 flight had not followed ATC's instructions and had turned too quickly, he thought. They did not receive any TCAS warnings and had no issue with the ATR flight or ATC. They followed ATC's instructions without cause of concern.

**THE GATWICK AIR** reports mentoring a trainee when traffic levels were medium with RW08R in use; the Wx was good. The EMB195 departed on a SAM 3P SID at 0813:42 with the ATR72, also on the same SID, behind at 0814:25. The next movement was a landing flight which received late landing clearance after the departing ATR. Some 90sec after the ATR72 was airborne the EMB195 flight was transferred to London on 134·125MHz and, whilst following the SID appeared it to make a slightly wider turn than normal but not extreme. The ATR72 flight remained on Tower frequency whilst the trainee dealt with other traffic. The ATR72 then appeared to turn earlier than the EMB195 and subsequently reduced the separation that did exist, the ATR72 crew then questioning the separation they had *'against the Embraer ac in their 1 o'clock'*. A heading was given of 280° before the mentor gave a turn onto 250° and descent to 2000ft as a precaution whilst coordinating with Radar to climb the EMB195 which was at 3000ft. The EMB195 flight continued its climb and very quickly reached 4000ft at which point the ATR72 flight was told to maintain 3000ft (it had only reached 2900ft in its descent before this) and he confirmed that there was now over 1000ft between the subject ac. TI was not passed to the ATR72 crew as the EMB195 had already been identified by the crew. During this time another ac (AC3) was sent around and was stopped at 2000ft initially against the ATR72 (although the 2 ac were never in conflict it seemed appropriate and fail safe as the ATR72 was now on a heading which was routeing it towards the FAT) but it quickly continued to altitude 3000ft on a heading of 150°. The ATR72 was then coordinated with Gatwick Radar to transfer the flight maintaining

3000ft on a heading of 250° which was effected. There was no SMF alert and all the ac were visual to the AIR in the VCR at all times.

UKAB Note (1): Met Office archive data reveals the Gatwick METARs as EGKK 160750Z VRB02KT CAVOK 07/03 Q1021= EGKK 160820Z 07005KT 020V100 CAVOK 08/02 Q1021=

**ATSI** comments that the two ac involved were both following a SAM3P SID which requires crews to fly: '*Straight ahead until I-GG D3, then left turn to intercept DET VOR R262. Crossing DET D26 at 2500 or above (4%). Crossing DET D36 at 3000. Follow DET VOR R262 to intercept SAM VOR R070 to SAM VOR. Crossing DET D43 (SAM D33) at 4000.*

The AIR position was manned by a high hours trainee and an experienced mentor. At the time, there was a high traffic loading with departures being prioritised. The EMB195 crew was given a conditional line up clearance on RW08R and the ATR72 crew given a similar clearance subject to the EMB195. The surface wind at the time was 050° at 5kt. As both ac were following the same SID (SAM3P) the standard departure separation would have been 2min, however, as the EMB195 is in a speed group 2 above that of the ATR72, this can be reduced to 1min. The MATS Part 2 clearly states that when time based separation is being used as the sole means of applying departure separation, 1 minute shall be not less than 60sec.

From the unit investigation, the departure interval used was 43sec. Analysis of the radar recording shows that when the EMB195 was first visible after getting airborne, there was traffic on a 2nm final and further traffic at 11nm from touchdown. Both the EMB195 and the ATR72 departed before the first of these ac landed. At 0815:10, just before the EMB195 crew had commenced their L turn, the AIR trainee instructed them to contact London Control. At 0816:45, the crew of the ATR72 queried their separation against the EMB195 "*…in our one o'clock*". The trainee immediately instructed the ATR72 crew to turn L heading 280° which was acknowledged. The mentor then took over and instructed the crew to turn further L heading 250° and to descend to 2000ft. At the same time, the TC SW Deps had instructed the crew of the EMB195 to climb to 4000ft and then to expedite their climb to 5000ft before passing TI on the ATR72.

Analysis of the Noise Preferential Route (NPR) readout shows that both ac turned at 3 DME but the radius of turn followed by the EMB195 kept the ac almost on the C/L of the NPR corridor. The ATR72 turned at the correct position but made a tighter turn, which had the effect of turning inside the EMB195. This, coupled with the reduced departure interval, resulted in the ATR72 catching up the EMB195 and lateral separation at 0817:00 reduced to 1·9nm at the same level before the EMB195 climbed above 3000ft.

UKAB Note (2): The Pease Pottage radar recording at 0817:06 shows the EMB195 steady on a track of 260° and climbing through altitude 3100ft QNH with the ATR72 tracking 290° level at 3000ft QNH separated by 1·8nm. Thereafter horizontal separation reduces further whilst vertical separation increases over the course of the next 3 sweeps - 1·6nm/300ft, 1·5nm/600ft and 1·5nm/900ft respectively - with the CPA of 1·4nm occurring at 0817:30 with the EMB195 now climbing through 4300ft and the ATR72 now descending through 2900ft, 1400ft below and turning L.

## PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The ATSI Advisor informed Members that CAA Flt Ops Inspectorate Dept had been consulted during the investigation phase and opined that the ATR72 crew had complied with the requirements of the SID, having climbed straight ahead until reaching I-GG D3 and then commenced turning L before quickly levelling at 3000ft. The ATR72 crew steadied on a NW'ly heading to intercept the required radial from DET VOR published in the SAM SID. However, all this occurred after the AIR had released the ATR72 without the required 60sec departure interval stated in the Unit MATS Part 2. An experienced ATCO Member explained the methodology utilised to ensure that the correct time spacing is achieved which on this occasion was only 43sec. It appeared to Members that the single RW operation at Gatwick had led to AIR attempting to depart the 2 subject ac in a gap between arriving flights which had, in the end, become very tight with landing traffic hot on the heels of the departing ATR72. One pilot Member opined that this incident scenario (jet powered ac followed by a propeller driven ac) was predictable from the outset. The EMB195 jet flying at a faster speed would describe a wider turn whereas the

slower ATR72 would turn more quickly, describing a tighter arc. Members agreed that the cause of this Airprox was that following an early departure release on the ATR72, the disparate turn radii of the 2 ac brought them into conflict.

An experienced commercial pilot Member opined that 'local operators' at Gatwick have long been aware of the strict requirements to follow the NPR, which overlies the SID, with crews being meticulous in ensuring compliance. Some airlines use Lat/Long coordinates set into the ac's FMS to ensure that ac intercept the DET R262 at D26 which is how the NPR corridor C/L and lateral swathe are depicted; a copy of the NPR readout relevant to the subject incident was displayed to Members. However, the promulgated SID does not stipulate that an ac has to achieve this R262 D26 position, only stating a level to reach by D26. Members were concerned that if the intention of the SAM SID is to ensure that ac fly a prescribed track and are to establish on the R262 by D26 then the SID should clearly promulgate this. The Board therefore made a safety recommendation to the CAA to review the promulgated SID accordingly.

Risk-wise, the ATR72 crew had seen the EMB195 and queried the separation distance with AIR. The controller had given the ATR72 crew a L turn and a descent away from the EMB195 whilst also coordinating with radar. The EMB195 was quickly climbed to 5000ft which enabled the ATR72 crew to climb back to 3000ft after a descent of about 200ft. These prompt actions and the visual sighting by the ATR72 crew allowed the Board to conclude that no risk of collision existed during the encounter.

## PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Following an early departure release on the ATR72, the disparate turn radii of the 2 ac brought them into conflict.

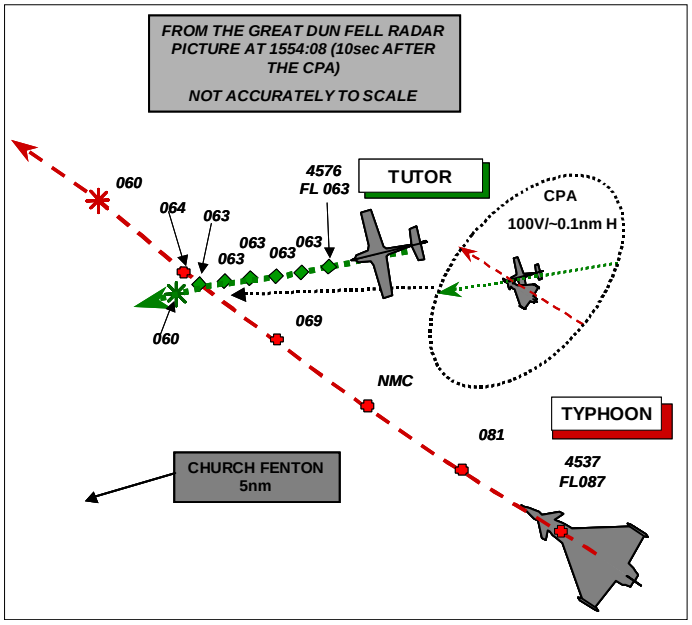
Degree of Risk: C.

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

## AIRPROX REPORT No 045/08

## AIRPROX REPORT NO 045/08

| | | |
|---|---|---|
| *Date/Time:* | 22 Apr 1554 | |
| *Position:* | 5352N 00103W (5nm ENE Church Fenton) | |
| *Airspace:* | Vale of York AIAA(Class: G) | |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | Grob Tutor | Typhoon |
| *Operator:* | HQ AIR (Trg) | HQ AIR (Ops) |
| *Alt/FL:* | 6000ft (QNH 1012) | ↓6350ft (N/K) |
| *Weather* | VMC Haze | VMC Haze |
| *Visibility:* | ~10km | 5km |
| *Reported Separation:* | 100ft V/0 H | 300ft V/200m H |
| *Recorded Separation:* | 100ft V/<0.1nmH | |




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

**THE GROB TUTOR PILOT** reports flying an instructional flight with a student pilot in a white and blue ac with strobes, nav lights and the landing light switched on squawking as directed with Mode C. They were heading 240° at 112kt on recovery to Church Fenton, in receipt of a FIS from APP, and had self-positioned on the POL 080/38nm (overhead the disused airfield of Acaster Malbis) at 6000ft on QFE 1012mb. They had been in a shallow descent until just prior to that point but were then maintaining straight and level. They had just transmitted a Practice Pan with a simulated engine underspeed and were maintaining the normal height for a PFL to the airfield when a Typhoon was first seen directly above them at a vertical separation he estimated to be 100ft, climbing away in a North-Westerly direction. Immediately on seeing the Typhoon he (the instructor) took control from the student and pushed downwards although this may have been more of a reaction than avoidance as the Typhoon had already passed to the NW and also appeared to be taking avoiding action. The Typhoon was heard and the wake turbulence of the ac felt before the ac was actually seen but he could not determine its heading or height prior to that point.

He immediately reported the Airprox to Church Fenton APP and recovered to Church Fenton without further incident. The report was also passed to Church Fenton TWR as he was aware that the Duty Instructor was in the VCR. He assessed the risk as being very high.

**THE TYPHOON PILOT** reports flying a dual sortie with another qualified Typhoon pilot in a grey ac with all lights switched on squawking as directed with Mode C. They were heading 300° at 480kt and, following a handover from London Military to Linton LARS, they were in receipt of a RIS and were cleared to descend to FL60. They received a call from Linton LARS reporting *"Traffic, 12 o'clock, 10 miles, FL65, FL50 manoeuvring"* [recorded on the mission tape but from transcript actually passed by London Mil before handover]. They continued their descent on the same heading and their radar scan was centred to the area of the reported traffic. About 40sec later the front seat pilot saw a white flash in the canopy, passing immediately under the right hand fore-plane. An instinctive climb was initiated but the front pilot was unsure as to whether the flash had been from the ground or from another ac. A short time later they commenced an orbit to look for the possible confliction and checked for contacts from ATC but nothing was seen or reported in their immediate vicinity. The Typhoon then resumed track and continued with the sortie.

**MIL ACC Reports** that a Coningsby-based Typhoon was transiting from Coningsby to the Harrogate area with Controller 13 at LATCC(Mil) (London Mil) on frequency 259.60 MHz squawking 4537 with Mode C. The Typhoon was in the descent from FL300 cleared to FL060; was prenoted to Linton-on-Ouse and had changed to a Linton squawk at the time of the incident in anticipation of the handover. Meanwhile a Grob Tutor was recovering to

Church Fenton for a visual recovery on Church Fenton APP squawking 4576 with Mode C. The Grob was in level flight at 6000ft on 1012mb and both ac were VMC but in haze. The London Mil controller reported that he was working 3 speaking units on 3 separate frequencies at the time of the incident.

The RT transcript provided by NATS had timings only to the nearest minute. The Typhoon was handed to London Mil by Coningsby Departures on a RIS at 1545 climbing to FL150 and requesting FL300, its pilot calling, *'London Mil Typhoon ac London Mil C/S on handover in the climb FL300 Requesting Radar Information'* and London Mil responded *'C/S London Mil identified climb FL300, Radar Control on passing FL150'.* No formal statement of the type of service (RIS) below FL150 was made. Radar Control (RC) above FL150 was required due to CAS, Y70, which has a base level of FL155. London Mil had just completed one handover of traffic to a terminal unit and were listening out on a second UHF frequency which required the controller to monitor an internal silent handover of a formation under RIS conducting GH that was about to be handed to them. This is a procedure used by military controllers using an electronic system to pass data whilst listening to the frequency and observing the radar for compliance of the conditions for silent handovers. This was completed at the same time as providing a RIS to a civil ac and RC to the Typhoon that had reported ready for descent. At 1547 the Typhoon was given own navigation and passed the Linton weather, *'C/S Linton 25km Weather Nil Few 3500ft, Bkn 22,000ft, and the Barnsley 1-0-0-6 this hour 1-0-0-7 the next'.* The Typhoon acknowledged *'1-0-0-6 copied thanks very much C/S'* and at 1550 the Typhoon was cleared to descend, the pilot acknowledging the descent. London Mil then instructed the pilot to change squawk to 4537 and this is observed on the radar replay at 1553:00, the change being completed 7sec later (at 1552:36 the radar replay shows the Typhoon's Mode C indicating FL161, at 1553:08 it indicated FL118 and at 1553:23 it indicated FL087). At 1553:xx London Mil passed TI as, *'C/S Traffic 12 o'clock range 10 miles manoeuvring indicating FL065 out of 50'* and the pilot acknowledged this TI. The TI as taken from the tape transcript is inconsistent with what is seen on the radar recording and the London Mil Controller's recollection in his report. The radar replay clearly shows 4 ac on the Typhoon's track, one Mode C clearly shows the ac to be at FL030 whilst the Grob's Mode C is level at FL060. The 3rd ac is level at FL050 and the 4th ac is also at FL050 to the NW of Church Fenton. The Typhoon's rate of descent is such that it is reasonable that the FL030 traffic was not called.

The timings in the tape transcript appear to be consistent with the radar replay based on the range of the TI and the squawk change of the Typhoon. At 1554:xx the London Mil controller transmitted to the Typhoon, *'C/S contact Linton Zone 2-3-5-.-2 Bye Bye'* but the pilot replied *'C/S standby one'*. London Mil then retransmitted, *'C/S'* and the pilot replied *'C/S standby'* followed by, *'C/S we've just had er a possible sight of an aircraft pass close aboard down our right hand side possible tally do you have anything on radar now er er the South East'.* The London Mil controller responded at 1554:55, *'C/S there is traffic to the South West range 3 miles tracking East no height information'.* The Typhoon conducted a right hand orbit before the handover to Linton Zone is completed at 1555:xx.

The London Mil Unit investigation was incomplete due to the lack of robust analysis of the tape transcript in conjunction with the radar replay and was conducted largely on the basis of the reports made by the controller and supervisor involved. The requirement for a tape transcript was overlooked by the unit and was only produced when this HQ Air requested it. Had this been available to the Unit it would have been clear that the Typhoon was not asked what type of service he required below FL195 and moreover that the service had not been changed from RC; therefore, the Typhoon pilot should have been passed Avoiding Action on the Grob and the other relevant unknown traffic. Further, insufficient and ambiguous TI was passed to the Typhoon pilots which exacerbated their poor SA. The Unit also missed several significant points in their debriefing of the controller involved. Additionally, the Linton Zone controller did not ensure that relevant TI had been passed by London Mil during the handover of the Typhoon to him, in accordance with SOPs.

UKAB Note (1): The recording of the Great Dun Fell radar shows the incident clearly. The Typhoon, squawking 4537 with Mode C, approaches the CPA from the SE heading about 300° and descending slowly from FL087 (at the start of the recording) while the Tutor, squawking 4576 with Mode C approaches from the NE heading initially 250° but in a slow right turn onto W, level at FL063. The ac continue to close and the CPA takes place at 1553:58, between radar sweeps. The projected horizontal miss-distance is less than 0.1nm (180m) (the minimum radar accuracy) and the minimum vertical is about 100ft (shown on the sweep 2sec after the CPA). On the subsequent radar sweep (10sec after the CPA and from which the diagram is taken), the Typhoon is level at FL060 and the Tutor has descended by 300ft (in one sweep) and is also displaying FL060.

**HQ AIR (OPS)** comments that this was a very close call where neither crew had any time to react to the presence of the other. ATC did not pass sufficient information to the crews for them to form a reasonable mental air picture of what was in the airspace around them.

**HQ AIR (TRG)** comments that the direction, speed and camouflage of the Typhoon made it difficult for the Tutor crew to see the approaching ac. Likewise, the Typhoon crew had a similar level of difficulty in seeing the light coloured, slim profiled Tutor in the hazy weather conditions. Both crews correctly requested ATC services to help with their SA. Having been given TI, albeit incomplete, the Typhoon crew may have thought that the notified traffic was climbing and therefore not a threat.

## PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members noted the incomplete investigation into this incident by LATCC (Mil) and accepted that HQ Air had taken timely follow-up action to prevent any recurrence. Members also noted that neither ac had been TCAS equipped but were briefed by the HQ Air (Ops) Member that the Typhoon had sophisticated systems that should in most circumstances obviate the need for TCAS.

Although both pilots had been in receipt of an ATC service appropriate to their respective activities, the incident had taken place in Class G airspace where 'see and avoid' is the primary means of collision avoidance. It was disturbing both to civilian and military Members that in this incident neither crew (4 pilots) had seen the opposing ac until it was too late to take any avoidance, both reporting that their manoeuvres had been as a reaction to passing close to one another. Thus, although there had been significant inadequacies in the (air traffic) controlling of both ac, the Board considered that the prime cause of the incident had been that neither crew had seen the other ac. In considering why this had been the case, Members considered primarily the weather conditions; the colours of the 2 ac; the relative positions and flight paths of the two aircraft; the visibility from the respective cockpits and the Typhoon's air defence radar system.

Members noted the in-flight visibilities reported by the two pilots and decided that it had most likely been below 8km. That being the case and bearing in mind the closing speed of around 420kt, the crews had of the order of 40sec available in which the other ac was theoretically visible. Although the Typhoon descended about 4000ft in that time, a military Member familiar with fighter operations pointed out that as it was flying at 480kt the attitude of the ac would probably have been such that the Tutor would not (at least initially) have been obscured by the Typhoon's nose or foreplanes. The Tutor, which had right of way, had approached the Typhoon's flight path on a line of constant bearing from the 1 o'clock with no motion relative to the background terrain. This would make the Tutor difficult to see, particularly when the altitude information passed by the controller indicated that the Tutor was climbing through FL65 rather than descending and levelling at the alt at which the Typhoon intended to level. Members noted that the Typhoon crew had been using their radar to try to locate the Tutor. Despite that Tutors are largely of composite (rather than metal) construction and had a small relative motion, specialist Members considered that there was no apparent reason why it should not have been displayed on the Typhoon radar system. Specialist Members considered it probable that both Typhoon pilots had been preoccupied with other and, in the Members' opinion, at the time less important tasks. This was the second Airprox assessed by the Board recently when a Typhoon pilot had not seen a light ac on the radar system despite there being no apparent reason why it should not have been displayed. That being the case, the HQ Air (Ops) Member and the DARS Advisor undertook to investigate the problem and, if necessary, highlight it in publicity.

As regards the Tutor, the Board was informed that the Instructor would have been seated in the left hand seat and would therefore have been on the side from which the Typhoon approached. The crew were preparing to perform a PFL and he would have been busy instructing and monitoring his student pilot. The student, in turn, would have been concentrating on setting the ac up for the exercise and transmitting the Practise Pan. In any case the grey Typhoon was approaching them from the grey haze in their high 7.30, also on a line of constant bearing, and it would have been very difficult for them to see. As it was the ac came very close indeed at the CPA and neither crew had seen the other ac until it had effectively passed them so the Board considered that there had been an actual risk of collision.

In considering if there had been any other factors that had contributed to the effective non-sightings the Board was concerned that, although both pilots had opted for an ATC service, this had not prevented the ac coming so close to one another.

The Tutor pilot, as is standard practise, opted for a FIS for their visual PFL from the standard start point. While accepting that when providing a FIS the controller's responsibilities are very limited, Members noted that Church Fenton APP is located at Linton on Ouse and it should have been apparent to the controller from his radar display that the approaching Typhoon would be in confliction with the Tutor. Therefore, under the terms of a FIS a warning would have been appropriate. Also, although the Typhoon had not been formally changed from RC to a RIS, specialist Members considered that the pilot had effectively been in receipt of a RIS as it was apparent to them that the London Mil Controller thought that that was what he was providing. Accepting that the London Mil Controller had been busy and the Typhoon had been in the process of handover, controller Members considered that the inaccurate TI given had contributed to the Typhoon crew not acquiring the Grob visually. Further, the opinion of specialist controllers was that the Typhoon should not have been handed over in conflict with the Tutor and that co-ordination would have been not only appropriate but fairly straightforward.

The Mil ACC Advisor briefed the Board that, although fully qualified, the LATCC Mil Controller concerned was relatively inexperienced. The Advisor also briefed that the unit were using the incident as an example in training exercises.

## PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Effective non-sighting by both crews.

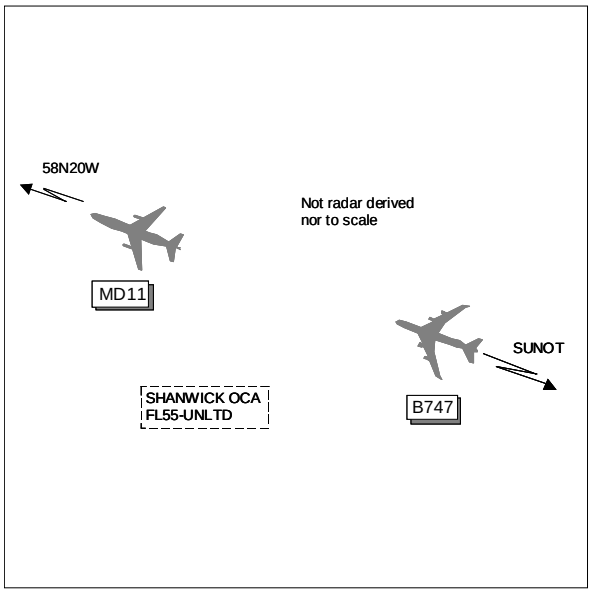
Degree of Risk: A.

Contributory Factor: Lack of adequate TI from ATC.

## AIRPROX REPORT No 046/08

## AIRPROX REPORT NO 046/08

| | | |
|---|---|---|
| *Date/Time:* | 23 Apr 2245 | (NIGHT) |
| *Position:* | 5729N 01714W | (320nm W Benbecula) |
| *Airspace:* | OCA CTA | (Class: A) |
| *Reporter:* | ScOACC En Route | |
| | *1st Ac* | *2nd Ac* |
| *Type:* | MD11 | B747-400 |
| *Operator:* | CAT | CAT |
| *Alt/FL:* | FL315 | FL320 |
| *Weather* | NK NR | NK NR |
| *Visibility:* | NR | NR |
| *Reported Separation:* | NR | NR |
| *Recorded Separation:* | NR | |




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

**THE ScOACC EN ROUTE CONTROLLER** reports that the MD11 flight was estimating SUNOT at 2236 F310 but did not downlink an Automatic Dependant Surveillance (ADS) waypoint position report when O/H SUNOT – an ADS Waypoint Reporting contract had not been fully established by this time. At 2237, a position report in Controller Pilot Data Link Communication (CPDLC) format was received from the MD11 flight indicating 5702N01510W 2237 F310 but being unable to accept such reports he elected to wait for a possible voice report via Shanwick Radio. By 2245 with no voice report having been received, he selected an ADS Demand Contract to confirm the position of the flight prior to requesting a SUNOT report by voice. This generated an ADS report which indicated the position of the MD11 as 5729N01714W 2245 F315 when its cleared level was F310. Being aware that the B747 had reported SUNOT at 2236 F320 he issued a CPDLC descent clearance to the MD11 flight at 2245 to descend to FL300, the crew acknowledged this at 2246 and he then began to format essential TI to be passed to both flights. At 2248, immediately prior to issuing TI, he again selected a Demand Contract report from the MD11 flight which indicated F301 so on this basis he elected not to issue essential TI. The MD11 flight reported level F300 at time 2248 and this was confirmed from an ADS report 5737N01758W 2248 F300. A Demand Contract was sent to the B747 flight, which indicated 5735N01743W 2248 F320, a lateral separation of 8·3nm, but previously at 2245 vertical separation was 500ft.

**THE MD11 PILOT** reports the crew complement was Capt, FO and Relief FO with the flight receiving a line-check from a Line Check Airman (LCA). The flight had initially climbed to FL320 before the crew received their oceanic clearance via ACARS (Aviation Communication Addressing and Reporting System) from Shanwick to cross at FL310 and prior to MINKU they were descended to FL310. The crew properly set and captured FL310 and had logged onto CPDLC and had an ADS contract. They were cleared to SUNOT and en-route they made HF RT contact with Shanwick Radio for SELCAL check. Passing SUNOT the crew sent a CPDLC POS REP at 2236 and the ac was at FL310 and had been so for approximately 30min/250nm. The LCA left the cockpit for a few minutes and in his absence the crew continued to discuss the Class II procedures being used. Not long after the LCA returned to the cockpit and as he was preparing to conduct an en-route debrief, the flight received a CPDLC message to descend to FL300 (approximately 2250Z). The Capt reached for the Flight Control Panel (FCP) altitude set knob and noticed that the current set altitude was FL315 and that the ac was at FL315; the LCA observed the same settings. The Capt set FL300 and descended and the crew then began to discuss how the ac could have climbed to FL315. Shanwick requested voice contact and they were apprised that separation had been lost against a B747 11nm ahead, he thought [actually behind], at FL320 and that a report would be filed. The crew suspects that at some point after SUNOT the Altitude Set Knob was inadvertently brushed and selected one click up which is 500ft. With such a small altitude change at that altitude and weight the throttle advancement and pitch up of the ac was imperceptible to the crew. It was believed that the knob was brushed either while selecting the heading/track button just above and to the L of the altitude set knob or while handling a chart that was positioned

on the glareshield above the knob. There was no definitive answer that was observed in the cockpit but it was fairly certain that the 500ft climb took place whilst the LCA was out of the cockpit.

**THE B747 PILOT** reports that the MD11 was displayed on TCAS ahead but was not in visual contact. There was never any TCAS warning and the altitude deviation by the MD11 was not noted from the display. The only indication that the crew had on the incident was from a Free Text Uplink from ScACC: - *For info traffic 1000ft below you at 18W had altitude deviation. Traffic ADS report indicated 500ft deviation to F315. Traffic was descended to F300 via CPDLC. Report made here at EGGX*.

No mention was made regarding an Airprox so no report was filed by the crew as basically they had had no real indication of proximate traffic as nothing was noted from the displays and no TCAS was received.

**ATSI** comments that at the time of the Airprox both flights involved were westbound and had been cleared from SUNOT (57N 15W) then 58N 20W, 58N 30W and further into Gander's airspace. The cleared level for the MD11 was FL310 and for the B747 FL320. The B747 was cruising at a speed of Mach 0.85 which was 0.02 faster than the MD11.

The MD11 had passed SUNOT at 2236 with the B747 crossing that position 1min later. The SUNOT position report from the MD11 flight was in a CPDLC format which should not be used for making position reports. Furthermore, the Shanwick Automated Air Traffic System (SAATS) does not accept such reports. The controller, in the knowledge that all ac were separated, decided to wait until a voice report was received from Shanwick Radio. At 2245, no such position report had been received and so an ADS Demand Contract was requested. This is a facility whereby a controller can request, via satellite data link, an immediate position report from the flight. This request generated the following message from the MD11, 'POS (MD11 c/s) - 5726N01658W/2244 315 58N/020W/2256 NEXT 58N030W'. The level, FL315, was highlighted on the controller's display in red.

Realising that the B747 was in the same vicinity and only separated vertically by 500ft, the controller instructed the MD11 crew to descend to FL300 and this instruction was acknowledged, by CPDLC, at 2246. The controller then set about formatting a message containing Essential TI: however, prior to issuing the message he made another ADS Demand and the MD11 crew reported at FL301 at 2248. The controller then decided not to send the Essential TI. The unit investigation assessed the minimum separation to have been 7nm and 500ft. This equates to 1min longitudinally when the requirement is 16min or 1000ft vertically.

There were no ATC errors disclosed.

UKAB Note (1): The Unit-quoted minimum separation was derived from running the scenario through the ScOACC simulator and freezing the incident when the MD11 was found to be at FL315. The En Route controller's measurement was derived by the SAATS from 2 position reports given by ADS data-link but these reports were not generated at the same time.

**NATS UNIT INVESTIGATIONS** reports that although the MD11 crew reported that they had logged on to CPDLC and had an ADS contract, at the time of the Airprox a contract had not been fully established. For flights to use the ADS Waypoint Reporting facility, the crew must log on to SAATS via satellite data-link to establish a contract. Assessment of the separation that was lost was based on the rule that for each 0.01 Mach number that the following ac is flying at, 3min needs to be added to the original basic 10min in-trail separation. As the B747 was at 0.85 and the MD11 at 0.83 a total of 6min would need to be added to the basic 10min longitudinal separation giving 16min in total. However, under these circumstances SAATS would have calculated the exact separation required.

The reporting controller was later asked why he cleared the MD11 to FL300 rather than back to FL310. He stated that this was to provide 'that little bit extra' as he was unaware why the MD11 was not at its assigned level and having FL300 available at the time, he chose the 'greater than minimum required' option.

## PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Pilot Members were not familiar with the MD11 ac's systems but were surprised that moving the Altitude Set Knob on the MD11 FCP had in this instance caused the ac to climb 500ft without giving any warning on the flightdeck. Ac manufacturers use different A/P systems but most require positive selection/activation to activate a setting/ mode change on the AFCS. The 500ft level deviation went unnoticed by the crew and it was only after the ScOACC controller had requested an ADS Demand Contract that it became apparent to both parties. Members agreed that although this had been unintentional, the MD11 crew climbed above their cleared level and into conflict with the B747 and had caused this Airprox. The controller had immediately instructed the MD11 crew to descend which was promptly actioned. The B747 crew had seen the MD11 on TCAS but had not noticed the level deviation; no TCAS warnings were generated on either flightdeck. Although this had been serious loss of Oceanic separation, the MD11 had been steady cruising at FL315 for some time without any intention of climbing higher, several miles ahead of the B747, which allowed the Board to conclude that there had been no risk of collision during this Airprox.

## PART C: ASSESSMENT OF CAUSE AND RISK

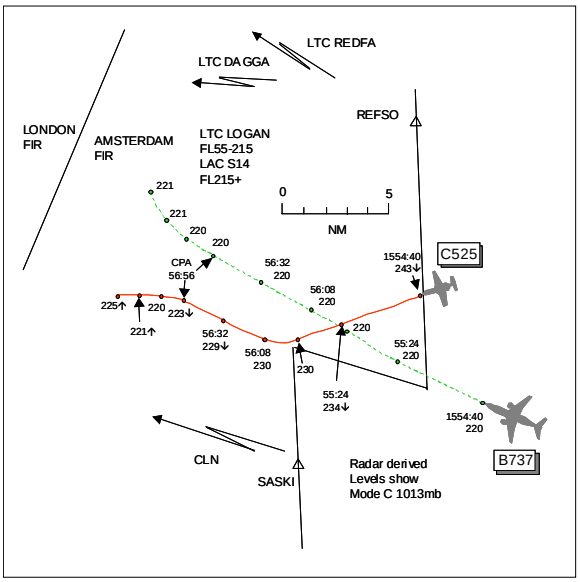
Cause: The MD11 crew climbed above their cleared level and into conflict with the B747.

Degree of Risk: C.

# AIRPROX REPORT NO 047/08

*Date/Time:* 17 Apr 1557
*Position:* 5142N 00222E (13nm SW REFSO)
*Airspace:* AWY L608/P20 (Class: C)

| | *Reporting Ac* | *Reported Ac* |
|---|---|---|
| *Type:* | B737-700 | C525 |
| *Operator:* | CAT | Civ Comm |
| *Alt/FL:* | FL220 | FL220↓ |
| *Weather* | VMC CLOC | VMC CLBL |
| *Visibility:* | 50km | |
| *Reported Separation:* | Nil V/2·5nm H | 1-2000ft V/6nm H |
| *Recorded Separation:* | 300ft V/2·5nm H | |




## PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

**THE B737 PILOT** reports inbound to Luton IFR heading 300° and 320kt and in receipt of an ATS from London on 135·42MHz, squawking with Mode C. Flying level at FL220 they were told 'avoiding action turn right heading 345°' and then again onto 360°. The other ac was seen on TCAS but not visually, as 'proximate' traffic at the same level in their 11 o'clock about 2·5nm away. The FO, PF, disconnected the AP and manually flew the R turn during which 'bank angle' was heard, approximately 35° of bank having been reached. No TCAS warnings were received and after the event they continued to IDESI. He assessed the risk as medium.

**THE C525 PILOT** reports inbound to Luton IFR and in receipt of a RCS from London squawking 4524 with Modes C and S. During their descent, heading 290° at 250kt following an ABBOT 1C STAR having been cleared to FL230, they were given further descent to FL170, he thought [actually FL200], and then a frequency change, he thought. After passing FL220 the controller asked them to climb to FL230 and turn L. Obviously traffic was the reason as TCAS showed a target which was then visually identified as the subject B737, in their 2 o'clock range 6nm and 1000-2000ft above, he thought. A frequency change followed and they continued their descent. They received no TA or RA warnings and could not determine the reason or misunderstanding due to high workload and high traffic density within London airspace. He assessed the risk as low.

**THE LAC S12/13/14T** reports working the bandboxed sector with moderate traffic levels. The C525 flight checked in on frequency heading 255° followed a few minutes later by the B737 flight, both Luton arrivals. He descended the B737 flight early so he could force it under the C525 and make it No 1 in the sequence before he descended the C525 flight down 'on top'. The B737 flight was transferred early to LTC EAST with a speed of 310kt and heading 300° with his intention to wait until LTC EAST descended the flight out of FL220 and then he would finish the C525's descent to FL220. His Planner then informed him that LTC EAST wanted the C525 descended to FL200. By now a number of flights had called on frequency and he turned the C525 flight onto a diverging heading of 295° as it crossed behind the B737 and descended it to FL200. In a misjudgement of ac type and performance, the C525 turned very quickly and separation was eroded. As soon as he spotted his error he immediately turned the C525 and requested the flight to maintain FL230, which the crew questioned and he saw that the C525 had started to descend. He followed that with an avoiding action turn onto 270° and he believed that LTC EAST also gave the B737 flight an avoiding action turn onto N.

**THE LAC S12/13/14P** reports that during a light to moderately busy period on the combined CLN Sectors, the Tactical was attempting to provide a good presentation of 2 Luton arrivals to LTC EAST by vectoring a slow Citation behind a B737 which was flying at IAS 310+. He received a telephone call from the LTC EAST controller requesting the C525 at FL200, below the Standing Agreement level of FL220. At this time the C525 was at FL230 and within 1nm of the B737 at FL220 but on a diverging heading of approximately 60°. Although the reason for

this coordination was not apparent to him, he did not question it. He wrote the coordination on the PFS and told the Tactical to descend the C525 when he was able. He then handed over the position but remained close-by and the new Planner then contacted LTC EAST to change the level coordinated so that the lower ac was at a lower coordinated level; this was accepted by LTC. However the Tactical then stated that LTC had been in control of the B737 for some time. Around this time the Tactical had descended the C525 flight to FL200 and issued a turn instruction to parallel the 2 ac: however, once the C525 finished the turn it was within 5nm. The Tactical told the C525 flight to maintain a safe level of FL230 but this instruction was not heard and the descent commenced, possibly because the instruction was stepped-on by another flight checking-in. Avoiding action (turn and climb) was given to the C525 flight but it was slow to respond.

**THE LTC EAST (REDFA) SC** reports acting as an OJTI with a first day trainee on the sector. Understanding that S14 had a complex situation developing he decided that by giving further descent to S14 on the B737 would help them out so he told his trainee to make the call. The trainee however coordinated the C525 [rather than the B737] descent down to FL200 and ended the call. The DAGGA Sector then informed him that S14 had called and were going to descend the B737 instead down to FL200. The B737 flight checked-in on frequency maintaining FL220. Noticing that the C525 was in the descent to FL200 and turning towards the B737, his trainee issued a R turn heading 345° to the B737 flight but did not use the words 'avoiding action'. He, the mentor, made a subsequent transmission to the flight to turn onto heading 360° for avoiding action followed by TI.

**ATSI** comments that at the time of the Airprox Sectors 12, 13 and 14 were being operated in a bandboxed configuration. Both ac were inbound to Luton and the B737 was following UL608 whilst the C525 was routeing along UP20; these routes converge at CLN.

The C525 crew contacted the S14T and reported descending to FL270 heading 250°. Shortly after the initial call, the controller instructed the crew to turn R heading 255°. The B737 crew called at 1549:35 and reported descending to FL280. The controller instructed them to descend to FL250 and to route direct to IDESI at a speed of 310kt or greater. At this time, the C525 was 30nm N of the B737 and both ac were on converging courses.

The B737 was descended, in stages to FL220, whilst the C525 was given a 'stepped descent', maintaining 1000ft vertical separation until, at 1554:35, the C525 was instructed to descend to FL230. Less than 1 min later, a telephone call from TC East was answered by the S14P and it was agreed that the C525 would be descended to FL200. Coincident with this call, the Tactical instructed the B737 crew to contact TC East. At this time (1555:25), the C525 was in the B737's 12 o'clock, crossing from R to L with the B737 maintaining FL220 and the C525 passing FL234 for FL230.

The S14T instructed the crew of the C525 to turn R heading 295° and at the same time a call was received, at the Planner position, from TC East but it went unanswered. At 1556:10, the Planner telephoned TC East and asked whether they (S14) could transfer the B737 at FL200 and the C525 at FL220 as the B737 was running ahead. This was agreed and the Planner pointed out that previously the C525 had been coordinated at FL200 but as the B737 was ahead then it would be best if it was at the lower level; this was agreed.

Whilst this conversation was taking place, the Tactical, who was unaware of the Planner's plan, instructed the C525 crew to descend to FL200. At the time this instruction was given the C525 was in the B737's 9 o'clock at a range of 2·7nm. The Tactical instructed the C525 crew (1556:30) to turn L heading 270° and maintain FL230 but there was no response. The controller repeated it 6sec later and a crossed transmission was received. The Tactical then instructed the C525 crew to turn L heading 270° 'avoiding action'. Meanwhile the Planner telephoned the TC East Coordinator and apologised adding that they (TC) could descend the B737 if they so wished. TC East was also passing avoiding action to the B737 crew. The Tactical controller then instructed the C525 flight (1556:50) to climb to FL230 and expedite just before STCA activated.

[UKAB Note (1): At the CPA separation reduced to a minimum of 2·5nm and 300ft, at 1556:56, as the C525 was in the 9 o'clock position of the B737.]

The unit investigation found that the S14T had taken into account the ac types and their relative performance. He planned to position the B737 ahead with radar showing that when the two ac entered the sector the C525 was 35kt slower. This speed differential increased when the B737 was instructed to maintain 310kt or greater. As the 2 ac descended he expected the C525 to drop back so he could descend the B737 to FL220, transfer it to TC East and then, when the level was clear, descend the C525. When the Planner advised that TC had requested the C525

to be the lower of the two ac the Tactical instructed the C525 crew to turn R in order to parallel the 2 ac and descended the C525 to FL200. The Tactical controller advised that he misjudged the rate of turn of the C525 possibly due to a number of ac reporting on the frequency. On realising the error he attempted to stop the descent of the C525 but realising that separation was already eroded, issued an avoiding action turn.

The Planner thought that as TC had offered lower for the C525 this would not have fitted in with the Tactical's plan and so should have refused the request as it made the situation more complicated.

The TC East controller reported that he was working as an OJTI to a first day trainee. Realising that S14 had a complex situation developing he decided to assist them by giving further descent in respect of the B737. He instructed the trainee to make the telephone call but the trainee coordinated the lower level for the C525 and ended the call. When he, the TC East SC, was advised by TC Dagga that S14 had called and were going to descend the B737, and noticing that the C525 was in the descent to FL200 and appeared to be turning towards the B737, the trainee issued a R turn instruction to the B737 crew but, as he had not used the words 'avoiding action', the mentor took over the RT and instructed the B737 crew to turn onto 360° as avoiding action and then followed it with TI.

## PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The NATS Advisor informed Members that the TC E mentor was aware of his trainee's erroneous coordination with S14 and had tried to recall S14 almost immediately afterwards but his telephone call had gone unanswered. Also, the NATS Human Factors department is conducting an assessment into decision making processes and interactions between Tacticals and Planners under stressful or high workload situations in order to provide guidance on techniques for preventing similar communication failures within the T and P team.

In the subject incident, the S12/13/14 Tactical and Planner had both been working on a plan to present TC E with the B737 ahead of the C525 and at a lower level. This train of thought was also mirrored by the LTC E mentor. However, the trainee had, in his telephone call to implement this plan by offering a level (FL200) below the standing agreement level of FL220 for the B737, erroneously used the C525 c/s and ended the call. An ATCO Member opined that during OJTI sessions it was crucial for the mentor to assess early on the potential workload and complexity on the sector and the resultant impact of the trainee's actions on adjacent sectors. During periods of increased workload, neighbouring controllers would be hoping for quick and correct coordination to be effected, allowing more time to concentrate on the developing traffic situation. The S12/13/14P had not queried this offered coordination and accepted it, even though it did not fit in with his and the Tactical's plan. Members thought that the Planner should have refused this offer or agreed this new plan with the Tactical before accepting the coordination. The Planner had than informed Tactical of TC E's coordination to descend the C525 to FL200 and annotated the PFS. Shortly after the subsequent TC E mentor's call attempting to correct his trainee's c/s error went unanswered, Planner had then re-coordinated with TC E that it would be best to implement their original plan by descending the B737 to the lower level. Meanwhile the Tactical had turned the C525 onto a heading of 295° in preparation for giving the flight descent to FL200. However, the Tactical had misjudged the C525's turn rate which led to it rolling out on a slightly diverging track but <3nm SW of the B737. A pilot Member familiar with C525 operations commented that as the C525 was flying at a slower speed – it was thought to be unusually slow for the type - its radius of turn was understandably tight. The S12/13/14T had then descended the C525 which had placed the ac in conflict with the B737 and this had caused the Airprox.

Looking at the risk element, the S12/13/14T had very quickly noticed that separation was lost and instructed the C525 crew to turn L away from the B737 and to maintain FL230. Unfortunately this transmission went unanswered and following a repeated instruction, a crossed transmission was received. At the third attempt, successful avoiding action was passed and acknowledged. Meanwhile, the LTC E trainee saw the C525 descending and gave the B737 flight a R turn away and the mentor then intervened by giving a further R turn as avoiding action. Whilst following their avoiding action instructions, the B737 crew saw the C525 on TCAS 2·5nm away to their L whilst the C525 crew saw the B737 on TCAS and then visually in their 2 o'clock, estimating separation of 1000-2000ft vertically and 6nm horizontally. The radar recording shows that the S12/13/14T's heading given to the C525 immediately prior to issuing descent clearance from FL230 had placed the subject ac on slowly diverging tracks

with the CPA (2·5nm) occurring as the B737 overhauled the C525. These elements were enough to allow the Board to conclude that no risk of collision existed during this encounter.

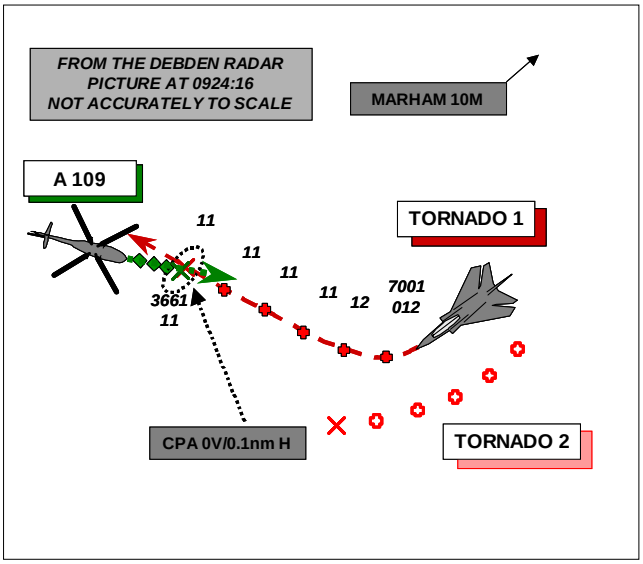
## PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The LAC S12/13/14T descended the C525 into conflict with the B737.

Degree of Risk: C.

## AIRPROX REPORT NO 048/08

| | | |
|---|---|---|
| *Date/Time:* | 25 Apr 0924 | |
| *Position:* | 5234N 00016E Marham) | (11nm SW of |
| *Airspace:* | LFIR UKDLFS | (Class: G) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | Agusta A109 | Tornado GR4 |
| *Operator:* | HQ DAAvn | HQ AIR (Ops) |
| *Alt/FL:* | 1500ft (QFE) | 1360ft (QFE ) |
| *Weather* | VMC CLBC | VMC CAVOK |
| *Visibility:* | 13-15km | 20km |
| *Reported Separation:* | 100ft V/0m H | 260ft V/50m H (from HUD tape) |




*Recorded Separation:*

*0*V/<0.1nm (<185m) H [Note: The vertical separation as the radar contacts merged was 0 but it was 200ft on the next radar sweep after the A109 had descended]

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

**THE A109 PILOT** reports that he departed Cottesmore at 0910 on a VFR transit to West Tofts barracks in the Stanford Training Area. About 10min into the flight, Cottesmore asked him to free call Marham APP on VHF which he did and was allocated a Marham SSR code. TCAS was not fitted. When he was 8-10nm SW of Marham, heading 140° at 140kt, he was placed on a FIS and was then told to fly at 1500ft on the Marham QFE [passed as 1024], which he did. As he levelled at 1500ft QFE the APP controller reported that there was jet traffic in his 12 o'clock at a range of 2nm at low level. As a military rotary pilot he considers low level to be below 500ft agl and he began to search there for the reported traffic. About 5-10sec after the TI report, he saw a plume of smoke in his peripheral vision and at the same time the controller called that the previously reported jet traffic was then on a reciprocal heading at 1nm and at the same height. He caught sight of the jet as it approached him and initiated an emergency descent, the jet passing very close overhead.

It is his belief that had he not caught sight of the jet when he did, the possibility of a collision would have been extremely high. He did not hear at any time throughout the evolution any radio traffic between ATC and the jet on the [VHF] APP frequency [actually ZONE – the Tornado was on UHF APP].

He continued his sortie, changing to Lakenheath APP, and reported the incident to the Marham ATC Supervisor on landing about 10min after the incident.

**THE A109 UNIT** comments that it is imperative that close encounters like this are acknowledged and given the widest possible promulgation so that any lessons can be learned.

Aircraft operated by this unit are flown solo but only by highly experienced pilots since they often experience very high workloads. The unit commander conducted a full verbal debrief with the pilot and he believes that his quick reactions averted a very much more serious outcome. In the unit the incident has served as a reminder (as it will to other units) to be ever vigilant even when under an ATC service, as well as highlighting the differences between the rotary and fast jet perception of low level.

**THE TORNADO GR4 PILOT** reports that he was leading a formation of 2, non-TCAS equipped ac, that were departing Marham VFR in 30sec trail, en route to Wainfleet Range before conducting evasion training in the Jedburgh area. The formation was on a standard low level VFR departure from RW24, in receipt of a FIS and had been cleared not above 1500ft due to a light ac. Both ac levelled below 1500ft and proceeded on a North-Westerly heading at 456kt to track 3nm N of Wisbech. At 0924 (4mins after take off), ATC informed Leader of traffic in their

11 o'clock at 1100ft and at a range of half a mile. Nothing was seen by the crews of either Tornado 1 or Tornado 2 and they continued their sortie uneventfully.

On assessing the HUD tape after the flight, it showed the A109 and, on calculating the separation, he assessed the risk as being high.

**THE MARHAM LARS CONTROLLER** (C/S Zone) reported that the A109 free-called about 10nm W of Marham inbound to the Stanford Training Area and the pilot requested a FIS for a [MATZ] stub crossing at 1500ft. He passed a 3661 squawk and instructed the pilot to fly at 1500ft QFE for the crossing and placed him on a FIS. At the same time he first saw fast jet traffic departing Marham displaying a 7001 squawk but not displaying any Mode C information. As the departing ac turned [towards the A109] he considered them a threat and called the traffic to the A109 pilot as being 4nm SE and indicating low level. As the confliction continued and the A109 pilot had still not called visual, he called traffic again. It was only when the departing traffic was 1nm SE of the A109 that the Mode C was displayed and it was indicating similar level so he called the traffic again and the A109 pilot called visual.

Throughout the evolution, an ac addressing Marham Tower continued to transmit on the LARS frequency despite being informed of his error. Just before the incident he had been working up to 10 VHF tracks inbound to Marham as part of a fly-in.

**MIL ACC** reports that an A109 helicopter first made contact with the Marham Zone Controller (Zone) on frequency 124.150 MHz, having been free-called from Cottesmore inbound to a HLS in the Stanford Training Area and the desired routing that required a penetration of the Western stub of the Marham MATZ. Marham were operating on RW24 and this required the A109 to cross through the Marham climb-out lane. At the same time,10 light ac were recovering to Marham on VHF either working Zone or TWR and one ac had also failed to deselect the Zone VHF frequency on transfer to TWR. Marham APP was also recovering a [precautionary] single-engined (SE) Tornado that had not declared an emergency and were providing a service to an IFR departure when Tornado A and B checked in (on UHF) at 0922:40 for a VFR departure. TWR had imposed a climb-out restriction on the Tornado formation of not above1500ft QFE due to light ac that were joining downwind for RW24 at 2000ft QFE. The Marham Supervisor was in the VCR supervising 2 newly endorsed controllers as they initiated the Emergency State 2 action for the recovering SE Tornado and managed the busy taxi patterns required for the scheduled VHF light ac and Station-based arrivals and departures.

The timings on the radar recordings were consistent with the timings taken from the tape transcripts provided by Marham ATC.

At 0922:40 the Tornado formation commenced their check in on the UHF APP frequency. Eleven seconds later, Tornado Leader transmitted "*Marham Approach C/S 1 and C/S 2 with you at fifteen hundred feet inbound Wainfleet Range"* and at 0922:58 APP acknowledged saying, "*C/S 1 and 2 Marham Approach eh good morning Flight Information VFR departure approved report leaving the MATZ going en route";* Tornado Leader responded "*Wilco C/S".* At 0922:49 an A109 checked in with Zone on their VHF frequency, a few seconds later transmitting "*C/S Agusta 109 one on board out of Cottesmore inbound to er Stanta Wes Tofts camp currently about er 10 miles to the West of Marham at the moment 1500 feet 1023 requesting Flight Information Service and MATZ penetration through the Eastern stub er through the Western stub".* The Radar Replay shows that at 0923:02 the A109 was 14.5 nm SW of Marham heading ESE squawking 7000 and with a Mode C of FL011 [Alt 1400ft] while Tornado Leader was squawking S7001 with Mode C also showing FL011 and was 4.3 nm SW of Marham with Tornado B 2nm behind, squawking S7002 with his Mode C showing FL006 [Alt 930ft] and both ac were heading SW after departing from RW24.

Zone responded to the A109 pilot at 0923:18 "*C/S roger Flight Information Service Squawk 3661 fly at fifteen hundred feet Marham QFE 1-0-2-4",* the pilot replied "*Squawk 3661 fly at fifteen hundred feet 1-0-2-4"* but the end of his transmission was clipped by a light ac working Marham TWR that inadvertently transmitted on the Zone VHF frequency; the transmission was completed at 0923:39 when Zone transmitted "*Light Aircraft you're still with Marham Zone".*

At 0923:28 the Radar Replay shows the A109 squawk disappear at the same time as Tornado A and B turn right and head directly at the A109, Tornado A and the A109 being 7nm apart. At 0923:46 Zone transmitted to the A109 *"C/S traffic believed to be you has traffic south east 4 miles North West bound indicating er low level fast jet traffic*

*departing from Marham"* and the A109 pilot replied at 0923.57 *"Er roger keeping a good look out C/S".* Two sec later the A109 squawk is seen to change to S3661 and Mode C indicates 011 with the ac 13.5 nm SW of Marham heading ESE and the Tornado in its 12 o'clock at a range of 3nm.

Zone updates the TI at 0924:01 *"Now in your 12 o'clock 2 miles reciprocal"* and the pilot responded *"Er not visual C/S".* At 0924:03 and 0924:04 both the Zone and APP transcripts show an unknown and background annotation *"Fifteen hundred feet which as I say"* and then the recording becomes indistinct. This is the only reference within the radar room that could be attributed to Zone passing TI to APP or requesting a MATZ crossing clearance. At 0924:06 APP transmitted to the Tornado formation *"C/S 1 and 2 traffic believed to be you has traffic west 1 mile eastbound no height correction indicating eleven hundred feet"* and at the same time Zone transmitted to the A109 *"Roger now 12 o'clock 1 nm similar height".* The A109 replied 3 sec later *"Oh yeah coming straight at me ***** *******".* Eleven sec later Tornado Leader transmitted to APP *"C/S copied has the, confirm the climb-out restriction of fifteen hundred has been lifted"* and they responded *"That has been lifted".*

The Radar Replay at 0924.18 shows the CPA to be 0.1nm at the same level and at 0924.25 the Tornado is in the A109's 6 o'clock at 1nm, the latter having descended 200ft. Zone then called further TI on Tornado to the A109 *"Roger you have further traffic south at 2 miles er west bound indicating similar level should be going clear".*

It is normal working practice at Marham for the Zone Controller to identify MATZ crossing traffic on radar before requesting a clearance or passing TI to APP. The Zone controller would normally be expected to be aware of departing traffic. However, in a situation where there were multiple inbounds at 2000ft and both controllers were working complicated situations that required a considerable amount of liaison calls, it is apparent that Zone was unaware of the climb-out restriction imposed on the Tornado formation by APP. Although the transcript does not reflect the reason the APP Controller placed the climb-out restriction on the Tornados, during the investigation he confirmed that it was in place against the multiple civil aircraft joining downwind. The Supervisor was required in the VCR to assist the newly endorsed controllers in handling the Emergency State 2 action and with the volume of taxiing aircraft and was therefore unavailable to assist in resolving the complicated situation.

The A109 and the Tornado formation were under a FIS and although both of the controllers involved exceeded their required remit for that service by rightly passing TI, the poor quality of that TI had a direct bearing on this incident. During the 2.4min between the A109 pilot's initial call and the CPA between Tornado A and the A109, the Zone Controller passed TI to the A109 on 3 occasions; the first TI however was misleading, *"C/S traffic believed to be you has traffic south east 4 miles North West bound indicating er* ***low level*** *fast jet traffic departing from Marham"* as by then the Tornado's Mode C was already reading 011, the same as the A109's. The A109 pilot in his report correctly identified the ambiguity caused when using **low level** as a reported height. The second call did not include any height information, *"Now in your 12 o'clock 2 miles reciprocal"* and it was only on the third occasion that an accurate relative height was passed, *"Roger now 12 o'clock 1 nm* ***similar height****".* The TI passed by APP to the Tornado formation was also misleading, *"C/S 1 and 2 traffic believed to be you has traffic west 1 mile eastbound no height correction indicating* ***eleven hundred feet****".* The word "indicating" in this TI should have informed the aircrew that it was derived from the Mode C readout [FL] rather than the actual alt. The APP controller used the information displayed on radar because of the time critical situation although in this instance this may be considered ambiguous.

**HQ DAAvn** comments that helicopters are considered to be low level when operating below 500ft and any jet traffic in that band are treated as a potential threat. As this crew were operating at 1500ft, the simple misleading statement of 'low level' clearly is not helpful in assisting the A109 aircrew's awareness as to the threat of the fast jet traffic. Compounding the aforementioned verbal statement with ATC instructing the fast jet to remain at 1500ft because of other VFR traffic during a busy traffic event cycle it would appear that Murphy conspired to test the involved aircrew in a most dangerous scenario. The most surprising fact of this incident is that all aircraft were speaking to the same ATC unit, carrying out their duties correctly and yet they were still able to come into conflict.

The helicopter pilot is to be commended for his alertness and incisive reaction which clearly averted a more severe incident than actually transpired.

**HQ AIR (OPS)** comments that there was some confusing terminology passed to the two ac by Marham ATC. The A109 pilot was right in assuming that the Tornado traffic was below him. Also, although factually correct, the wording of the A109's height as *"****indicating eleven hundred feet****"* would not immediately cue the Tornado crew that the conflict was at the same height.

## AIRPROX REPORT No 048/08

### PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Mil Low Flying Ops Advisor reminded the Board that the definition of Low Level, namely below 2000ft agl, is universal throughout the UK Military and should not lead to any confusion either by controllers or aircrew.

The Mil ACC Advisor reminded the Board that the radar recording from which he conducted his analysis was not taken from the same source as that feeding the display at which the controllers were looking. This might lead to slight differences in what was actually displayed and of particular relevance to this investigation, the precise time when the Tornado Mode C data was first displayed to ZONE.

Notwithstanding the actions of Marham ATC in providing a FIS both to the Tornado and the A109, the Board noted that both pilots had been operating under VFR in the 'see and avoid' environment of Class G airspace. Members noted, as clearly described in the Mil ACC report, that Marham had significantly exceeded the minimum requirements for a FIS in a very busy and complex situation. Nevertheless, Members agreed that there had been some significant shortcomings in that misleading information was passed which may have led to both pilots being less concerned than the situation warranted.

Controller Members noted that at the time of the Airprox the Supervisor was in the VCR and was correctly concentrating solely on the (other) Tornado that was recovering single-engined. Although accepting that all ATC positions were very busy and that inter-position landlines might have been congested, it seemed to some controller Members that there had been poor information flow between APP and ZONE. In particular, Members noted that ZONE was not aware that APP had limited the departing Tornados to 1500ft, the height at which he (ZONE) had placed the A109 for its transit through the SW part of the MATZ stub. It was also unclear why APP had not been alerted by ZONE about the MATZ (stub) crosser (also at 1500ft) that was transiting the Tornados' climb-out lane. To Members, there was no apparent reason why the A109 could not have been descended below the stub or re-routed slightly to the S. It was thought likely by controller Members that this had been because the A109 was already at that height.

There was considerable discussion regarding the first TI passed by ZONE to the A109 pilot which stated that the Tornados were at 'low level'. The Tornados had been climbing out on a (height limited) standard range departure. Military Controller Members thought that ZONE should have been aware not only of the ground track the Tornados were following but also the height they were climbing to and should have been warned by APP that the ac had been limited to 1500ft due to visual joiners at 2000ft. ZONE should have therefore been made aware that, although they had just taken off and were (probably) not yet displaying any Mode C data, the Tornados would be climbing and would shortly come into conflict with the A109. The second TI had also been slightly misleading as no height/alt was passed, probably leading the A109 pilot to continue to believe that the (Lead) Tornado was remaining well below him as previously reported. It was only the third and final TI, passed at 1nm when the ac were closing at about 600kt (10nm/min giving the A109 pilot 6sec to react and manoeuvre) that was accurate. The TI passed to the Tornado(s) was also inaccurate as it indicated that the A109 was at 1100ft and therefore not a significant threat (and in any case probably already below the nose of the ac) when it actually was at 1500ft and almost directly in the Lead Tornado's flightpath. Regardless of whether this was passed correctly or not, and there was considerable debate amongst Members, it was dangerously misleading to the Tornado pilot who also had 6sec to see the A109 and react to it; in the event he did not see it. Fortunately although the Tornado crew did not see the A109, the latter's pilot saw the conflicting Tornado just in time and did react in the short time available, descending his ac by a margin sufficient to ensure that there was not a collision.

However, while noting these mitigating factors, the Board agreed that the prime cause of the incident had been that the pilots had not seen the opposing ac in good time.

When determining the degree of risk the Board noted the most helpful HUD analysis conducted by the Squadron at RAF Marham, Members accepting the calculated miss-distance which led to the Tornado pilot's assessment of a high risk. When deciding the degree of risk, Members also noted that the A109 pilot assessed the risk as being very high. The Board accepted both assessments, agreeing that safety had been compromised, but had some difficulty in determining whether or not there had been an actual risk of collision. Although there had always been

about 50m horizontal separation and that the A109 pilot's avoidance had been effective, the Board agreed that since the horizontal miss-distance had been so small and the sighting and avoidance taken by the A109 pilot was so late that there had been an actual risk of collision.

## PART C: ASSESSMENT OF CAUSE AND RISK

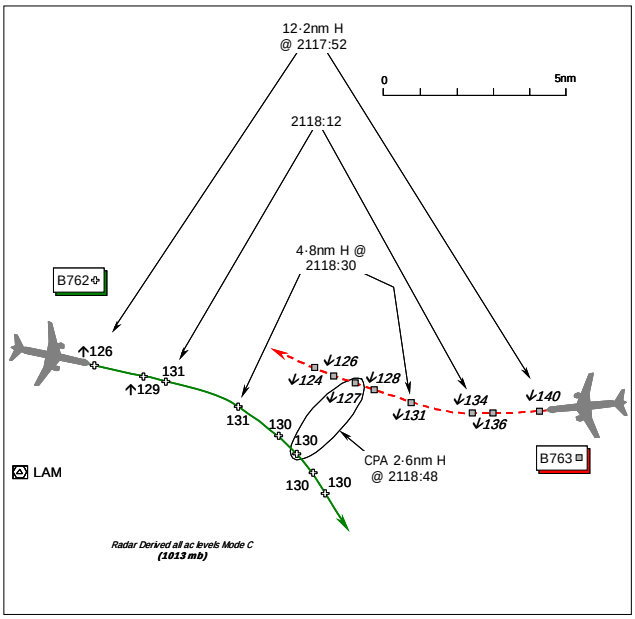
Cause: Non sighting by the Lead Tornado crew and a late sighting by the A109 pilot.

Degree of Risk: A.

## AIRPROX REPORT No 049/08

## AIRPROX REPORT NO 049/08

| | | |
|---|---|---|
| *Date/Time:* | 24 Apr 2118 | NIGHT |
| *Position:* | 5140N 00023E (9nm E of LAM VOR) | |
| *Airspace:* | LTMA | (Class: A) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | B767-200 A2 | B767-300 |
| *Operator:* | CAT | CAT |
| *Alt/FL:* | FL125↑ | ↓FL130 |
| | SAS | SAS |
| *Weather* | VMC CLBL | VMC |
| *Visibility:* | 10km | NR |
| *Reported Separation:* | | |
| | 300ft V/3-4nm H | NR |
| *Recorded Separation:* | | |
| | Nil V @ 4·8nm H<br>Min H 2·6nm @ 300ft V | |




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

**THE B767-200 A2 PILOT (B762)** reports he was outbound from London Luton climbing at 290kt and in receipt of a RCS from LTC NE DEPARTURES. Whilst the ac was being flown manually they were assigned by ATC a radar heading of 105° and climb to FL240. These were read back to ATC and crosschecked on the MCP panel. Passing about FL125 they received a rapid ATC instruction to turn "right heading 170° descend FL130". The PNF asked for the instruction to be repeated, which was partially "stamped on" by a second instruction from ATC. The PF immediately and accurately performed a quick R turn as instructed and levelled their ac at FL131. The PNF locked the direction of the turn and set FL130 in the MCP panel; pressed 'ALT HOLD' then heading selected 170° whilst acknowledging and reading back the ATC instruction. As he glanced at the TCAS the PNF noted an amber target almost immediately disappear off the left side of the screen. The PF observed a very momentary TCAS RA climb during the turn and when everything settled ATC gave them an apology and the flight was continued uneventfully.

During their turn the PF had made a very momentary visual sighting of another ac at about 12 o'clock in what appeared to be a R bank. The PF had also noted a momentary amber target in the top L quadrant of the TCAS display.

During the period of the Airprox, the weather was VMC clear of cloud with good visibility and no turbulence. He added that they have tried to be as accurate and precise as possible in recalling what was a very fast event.

**THE B767-300 PILOT (B763)** provided a concise account reporting that they were inbound to London Heathrow and in descent at 300kt. Whilst approaching LAM, ATC gave them a R turn to avoid a departing B762 jet climbing through FL120 whereupon a TCAS RA was enunciated to DESCEND. The autopilot had been disconnected before the RA to action the initial turn requested by ATC. They were visual with the other traffic at all times and avoiding action was also given to the other crew.

**THE LTC COMBINED NE DEPARTURES, LAMBOURNE AND LOREL RADAR CONTROLLER (NE DEPS)** reports that the B762 came on frequency from Luton and was initially climbed to FL70. He co-ordinated FL240 with DOVER Sector, obtained permission to climb in EAST's airspace and climbed the flight accordingly. The B763 was inbound to Heathrow via LAM but he had to ask for it to be transferred to his frequency and was thus a little late getting into descent. Recognising that the two ac were in conflict with each other, he instructed the B762 crew to stop their climb at FL130 with every intention of stopping the B763 at FL140 as it was descending to FL120 but he was interrupted by another flight on a DVR departure from Stansted. The B763 continued its descent and avoiding action was given to both the B762 and the B763 crews.

**ATSI** reports that at the time of the Airprox the controller was operating the LTC NE DEPARTURES and LTC LOREL positions bandboxed together. He described the traffic levels as *"reasonably quiet"* and the workload as *"light"*. The outbound B762 crew called passing 2600ft following a DVR 7B SID from Luton and were instructed to climb to FL70. Some 30sec later, the controller instructed the crew to fly a heading of 105º and 1min after that, at 2113:00, they were given clearance to climb to FL130. The controller devised a plan, based on the B762's performance and his knowledge of the ac, to 'jump' the B763 inbound to the LAMBOURNE hold. This was despite the fact that the crew of the other ac involved - the B763 - was not yet on frequency and would be descending to FL150 in accordance with the standing agreement.

Following co-ordination with LTC EAST and the LAC DOVER Sector, at 2114:20, the B762 crew was instructed to climb to FL210. At this time the B762 was 8nm SE of Luton, passing FL66 and the B763 was in its 12 o'clock range 52nm levelling at FL150. The controller later reported that he was aware of the B763's presence when he instructed the B762 to climb to FL210 [2114:30] and also the potential for confliction: however, he assessed that the level change would be completed prior to lateral separation being eroded.

As the B763 flight was still not on the controller's frequency, despite him having called it 3 times, he telephoned TC East and asked for the flight to be transferred. Analysis of the radar recording showed that the B763 maintained FL150 for a period of 2min 40sec over a distance of some 16nm. Despite this the controller continued with his original plan and, at 2116:50, when the B763 called, the crew were instructed to descend to FL120. At this time the B762 was climbing through FL113 and head on to the B763 at a range of 24·8nm. The controller did not ask either crew to expedite their respective climb or descent to facilitate the level change. The crew of the B763 enquired as to whether there were any delays and the controller advised that there should be none before instructing the crew to route direct to LAMBOURNE and reduce speed to 250kt. This was read back but the controller then told the B763 crew to fly a heading of 285º.

It was around this time the controller realised that his plan was not working and so transmitted at 2117:50, "[B762 C/S] *stop climbing flight level 1-3-0*". The B762 crew asked if that call was for them and the controller transmitted again [without prefixing the transmission with a callsign] "*Stop climb flight level 1-3-0 turn right heading 1-7-0 degrees*". The B762 crew's response was "*er flight level 1-3-0 sir this correction is that for* [B762 C/S]". [UKAB Note: NE DEPS then repeated the last part of his instruction again, now using the prefix 'avoiding action' for the first time at 2118:10: "[B762 C/S] *avoiding action turn right heading 1-7-0 degrees*". Whereupon the B762 crew acknowledged the message *"Okay right 1-7-0 flight level 1-3-0* [B762 C/S]". The controller followed this by instructing the B763 crew "[B763 C/S] *right heading 2-9-5"*, which they acknowledged and reported visual with the B762. Shortly after 2118:30, the B763 crew reported "[B763 C/S] *TCAS descending, there we're now clear of the traffic* ". Subsequently, the B763 crew was instructed to descend to FL110 and the B762 cleared to climb to FL240.]

STCA had activated at low severity at 2118:09, when the two ac were 9nm and 500ft apart. As the turns took effect, the two ac were at the same level when at a range of 4·8nm and minimum separation was recorded at 2118:48, when it was 2·6nm and 300ft, as they passed abeam port-to-port.

As part of the Unit investigation the controller reported that he had intended to stop the descent of the B763 but another flight called and distracted him from doing this. Analysis of the RTF recording found that this other aircraft called after the B763 had been cleared direct to LAMBOURNE and not during the conflict resolution as the controller recalled. It was noted that, initially, the controller did not use the words 'avoiding action' and it was only when the B762 crew queried some transmissions that his tone became more urgent and, following the repeat of his instructions to the B762 crew but without using any callsign, the words 'avoiding action' were used. The controller commented that he had not given any avoiding action for at least 6 months and so a lack of recent practice may have influenced this decision not to use the words. The Unit have now taken steps to address this particular issue.

## PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board noted the NE DEPS controller's comment that he had not given any avoiding action for at least 6 months and that a lack of 'recency' may have caused him not to use the prowords 'avoiding action' in the first

instance, when it was warranted. Members were reassured to learn, from the NATS Advisor to the Board, that its use will be re-emphasised in TRUCE training for controllers (TRaining in Unusual Circumstances and Emergencies) at the Unit. Members stressed the importance of using 'avoiding action' to grab a crews attention which might well have helped the controller to elicit a quicker response here and prevented standard separation from being eroded.

It was plain that this conflict in the Class A airspace of the London TMA stemmed from NE DEPS' decision, from the outset, to 'jump' the B762 above the B763. A controller Member who is intimately familiar with the operation of this Sector explained that there was nothing unusual about the profiles of these two flights. He emphasised that the SOP is to climb the outbound to FL140 and descend the inbound track to FL150 thereby maintaining vertical separation until the opposing tracks have crossed in plan before releasing the flights to climb and descend respectively. Alternatively, horizontal separation can be maintained with tactical vectors until the 'crossover' has been achieved. Here, the controller's plan to maintain separation demanded a steady rate of climb from the B762 and a continuous or prompt descent from the B763 to ensure that vertical separation was achieved before the stipulated horizontal separation of 3nm was breached. The safe execution of this plan also required that the situation be monitored closely until the level change was achieved. Although the controller assessed that the cross-over could still be completed after he initiated the B763's descent from FL150 to FL120 prior to horizontal separation being eroded, this subsequently proved not to be the case. A controller Member queried whether the timing of the switch of the inbound B763 to NE DEPS from the previous sector was a factor but other controller Members believed that NE DEPS should have recognised earlier that his plan was not going to work and taken appropriate action accordingly. Key here, a controller Member opined, was not to dispense with vertical separation until horizontal separation had been achieved. As it was, it was just a little too late, not helped by the clipped instructions given to the B762 crew and their slightly confused response, which was perhaps understandable in these circumstances. Members concluded that an earlier stop-off of the B763's descent would have prevented this situation from arising and having 'locked' the B762 on the outbound heading with the B763 routeing direct to LAM, this Airprox had resulted because LTC NE DEPS vectored the B767s into conflict.

Turning to the inherent risk, the radar recording showed that the B763 descended through the level of the B762 at a range of 4·8nm, but this was after the two crews had been instructed to turn away following the complementary avoiding action issued to the B762 onto 170° and the R turn issued to the B763 onto 295°. This, coupled with the B763 crew's prompt response to their RA, the B762 crew's fleeting RA and the B763 crew's visual contact with the B762 throughout ensured that the situation did not get any worse. Taking all these factors into account, the Board concluded that no risk of a collision had existed in the circumstances reported here.

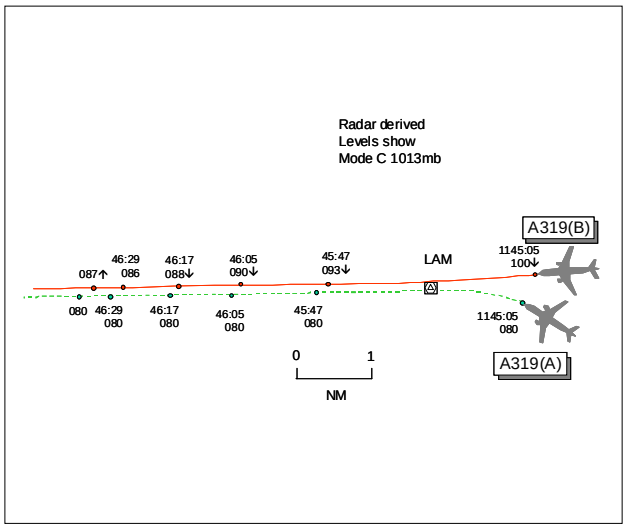
## PART C: ASSESSMENT OF CAUSE AND RISK

Cause: LTC NE DEPS vectored the B767s into conflict.

Degree of Risk: C.

# AIRPROX REPORT NO 050/08

| | | |
|---|---|---|
| *Date/Time:* | 26 Apr 1147 (Saturday) | |
| *Position:* | 5139N 00001E (5nm W LAM) | |
| *Airspace:* | LTMA | (Class: A) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | A319(A) | A319(B) |
| *Operator:* | CAT | CAT |
| *Alt/FL:* | FL80 | ↓FL80 |
| *Weather* | VMC NR | VMC NR |
| *Visibility:* | >10km | 10km |
| *Reported Separation:* | | |
| | 500ft V | NR |
| *Recorded Separation:* | | |
| | 600ft V/0·2nm H | |




## PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

**THE A319(A) PILOT** reports inbound to Heathrow IFR at FL80 and 220kt. On leaving the LAM holding pattern at FL80 (having previously been cleared to FL70 but stopped at FL80 in the hold) another company flight was cleared down to FL80 and descended to within 500ft vertically (no lateral separation). The other flight was seen on TCAS and was being monitored. A TA was received but ATC spotted the situation and climbed the other flight back to FL90 and then they were descended to FL70.

**THE A319(B) PILOT** reports inbound to Heathrow IFR at 220kt and in communication with Heathrow Director on 119·725MHz. After leaving LAM and cleared to descend to FL80 (ROD 500fpm), a TA was received on an ac below. ATC stopped their descent which was actioned and clearly read back. Another flight [A319(A)] asked ATC if their actions had necessitated the 'stop descent' instruction to be issued.

**THE HEATHROW INTERMEDIATE N** reports experiencing high workload owing to several factors including reports of unidentified flag carrying ac; a London/City to Heathrow positioning flight and a non-conforming ac in the hold. During this period he mistakenly believed that he had given A319(A) a vector off LAM and took the fps out of the active display. When he subsequently ascertained that the ac was continuing in the hold, he stopped its descent at FL80 to conform with standard procedure but omitted to replace the fps in the active display. The Heathrow N Support (SPT) subsequently descended A319(B) to the same level when in close proximity. This was missed owing to workload and coordination activity but was picked up by the Vertical Stack List (VSL). The descent of A319(B) was stopped and the flight was instructed to climb back to FL90 as it was passing FL88 and A319(A) was instructed to descend to FL70 as further resolution.

**THE HEATHROW N SUPPORT** reports taking over the position at 1136UTC mentoring a trainee working to Level 3. The situation was quite complex with a Cat B flight orbiting Central London at FL100 and a survey flight operating with TMA, SE of LAM at FL70. There was an inbound delay to Heathrow of just over 10min with his trainee allocating sequence numbers. The first distraction to normal operations occurred when a flight off LAM, AC3, reported seeing an ac below towing a very large flag which appeared to him to be quite close. An ensuing discussion with another flight, AC4, following AC3 to ascertain the height of the flag ac, apparently caused INT N to forget a heading off LAM to A319(A). His trainee quickly and commendably pointed out to INT N that the latter had descended A319(A) to FL70 which was inappropriate as it was still in the hold. INT N stopped A319(A) off at FL80 and gave another flight above A319(A), AC5, a heading off LAM to avoid a gap in the approach sequence. INT N had taken the A319(A) fps out of the LAM strip bay but left AC5's fps in place as a blocker as it was descended to FL80, now well ahead of A319(A). A319(B) was the next ac in the LAM hold descending to FL90. A second distraction then occurred with an executive jet flight airborne from London/City 3min before its allocated departure time. This caused a brief discussion and INT N was involved in added workload coordinating and vectoring this flight into the Heathrow sequence behind AC4. Meanwhile his trainee continued with his task of allocating sequence numbers. The third distraction then occurred when TMA phoned his trainee to warn that

another flight, AC6, was apparently having major difficulties joining the LAM hold. His attention was then taken up checking on the N SPT radar display that AC6, now well SW of LAM, was safe against both the Cat B flight and also against INT S traffic at BIG. He believed that at about this stage, whilst watching AC6, that INT N must have removed the AC5 fps from the LAM display, leaving A319(B) as the lowest ac in the CCTV display. INT S Director then phoned them on N SPT to warn that the fps on A319(A) was not in their LAM display. His trainee and INT N agreed that this was so but OK since INT N was aware of the situation and vectoring both the A319(A) and AC5 off LAM. He heard this discussion and with hindsight he should have intervened at this stage and insisted that the A319(A) fps or a 'blocker' strip was put back in the display. However, since INT N seemed happy with the traffic picture, he, the mentor, continued to monitor AC6 as it called on their frequency. He was aware that INT N had given A319(B) a heading off LAM and the INT SPT trainee dropped the flight to FL80. As he did so he glanced at the LAM CCTV display and seeing A319(B) was the lowest fps in the display, he was quite happy with this descent. What he did not see was that A319(B), now W of LAM, was directly above and garbling with A319(A). He also looked at the Mode S stack list and saw both A319 flights were showing 'goalposts' indicating that they were cleared to the same level of FL80. As he began to query this with his trainee, STCA began to flash red, high severity alert, showing a confliction between the A319's. INT N intervened to stop the descent on A319(B) and re-climbed it to FL90 whilst descending A319(A) to FL70. The pilot of A319(A) then commented that vertical separation had been as little as 500ft.

**ATSI** reports that the Heathrow N position was being operated by the SPT Controller (plus a relatively inexperienced trainee) and the INT DIR N. The A319(A) crew established communication with Heathrow Approach N, at 1132:18, reporting just approaching FL110 to Lambourne. The flight was instructed to hold at LAM, to expect a 10min delay. Some 5min later, the flight was descended to FL90. At 1139, A319(B) crew contacted the frequency, reporting passing FL126 descending to FL120 to enter the LAM hold. The flight was instructed to continue in the hold, to expect another 10min delay. Approximately 2min later, the trainee SPT Controller instructed A319(B) to descend to FL110. At 1142, the INT DIR, believing that A319(A) had been cleared to leave the hold, descended the ac to FL70. However, after intervention by the trainee SPT, the error was realised and the ac was vectored back towards LAM at FL80, onto heading 270°. A319(B) was then descended by the trainee to FL90. At 1145:00, A319(B) flight was instructed to leave LAM heading 270° by the INT DIR N. As the ac passed LAM they were laterally positioned together but at FL80/90 respectively. At 1145:46, the trainee descended A319(B) to FL80. This error was noticed straight away in the Vertical Stack List and the INT DIR N transmitted (1146:20) to A319(B) *"...stop descent and climb Flight Level Niner Zero stop descent"*. Immediately after receiving the pilot's readback, he instructed A319(A) to descend to FL70. A319(B) reached FL86 at 1146:29 before climbing back to FL90, minimum separation 600ft/0·2nm.

The INT DIR N had removed A319(A)'s fps from the display when he had erroneously cleared it to FL70. He believed that leaving the fps in position may have misled the TMA Controllers who would have seen the ac cleared to FL70 and thought it could be traffic to a survey ac operating east of LAM at FL70. The fps was annotated to indicate its descent by circling the FL70 box. It is possible to mask the wrong-circled level or to request a new fps but within the time constraints neither was used. Additionally, a blocking strip was not placed in the display. Initially, another inbound's fps (AC5) was used to indicate FL80 was occupied but this was removed as the ac descended. Because A319(A)'s fps had been removed by the INT DIR N the display subsequently indicated that A319(B) was the lowest ac. Consequently, the trainee SPT descended A319(B) to FL80.

The INT DIR N reported his workload as high and the traffic loading as medium-high. The SPT Controller described his workload as high. Both quoted a complex situation because of problems with other traffic in the vicinity at the time.

## PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The NATS Advisor informed Members that a review has taken place of the relationship between INT and SPT to ensure that there is a clear delineation of individual responsibility for each ac under their control. This review has resulted in the issuance of an SI. Also, NATS Swanwick Safety Dept convened a group of Heathrow LCEs to review 7 points highlighted in the HF report which in turn has led to pertinent topics being added to the 'Hot Topics' lists used by Local Competency Coordinators (LCCs). Finally, this incident is being used by LTC Training to

illustrate to OJTIs the need to exercise extreme caution with relatively low-time trainees in complex situations and the degree to which distractions can reduce OJTI attention.

Members agreed that this Airprox had occurred during a period of high workload and a complex traffic situation where the Heathrow N INT and SPT controllers were very much dependant on team-working, made more complicated by a mentor/trainee combination manning one position. The team had worked well when the INT DIR erroneously descended A319(A) to FL70 which was corrected after the SPT trainee pointed this out. However, not sticking to SOPs – masking the incorrectly circled level, obtaining a new fps or inserting a blocking strip – and taking the fps out of the display had sown the seeds for the Airprox. Members concurred with the SPT Mentor when he reported, with hindsight, that after the SPT trainee and INT DIR had agreed to this, he should have insisted that the normal 'modus operandi' was maintained by insisting that either the A319(A) fps or a blocker strip was put back in the display. Thereafter, as the situation unfolded with INT DIR vectoring A319(A) and having given A319(B) a vector off LAM, the SPT trainee had forgotten about A319(A) and reverted to normal SOPs, issuing A319(B) with descent to FL80 as its fps was showing on the CCTV to be the lowest ac in the LAM stack. The mentor had heard this clearance being issued and was happy as the CCTV confirmed his mental traffic picture that A319(B) was the lowest ac in the stack. These factors led Members to agree that the Heathrow N APP team had descended A319(B) into conflict with A319(A) which had caused the Airprox.

Pilot Members wondered why neither of the A319 crews queried the descent clearance issued by the SPT trainee to A319(B) as they should both have been aware of each other's presence from the RT and TCAS. A319(A) crew reported seeing A319(B) on TCAS, behind their ac, and were monitoring its descent whilst A319(B) crew had accepted the descent clearance and actioned the ATC 'stop descent and climb back to FL90'; both crews reported receiving TAs. The SPT mentor had noticed the confliction whilst looking at the VSL window and whilst querying this with the trainee, STCA activated. INT DIR intervened and stopped A319(B)'s descent and climbed it back to FL90 before instructing A319(A) flight to descend to FL70. These actions taken by the Heathrow N team allowed the Board to conclude that any risk of collision had been quickly and effectively removed.

## PART C: ASSESSMENT OF CAUSE AND RISK

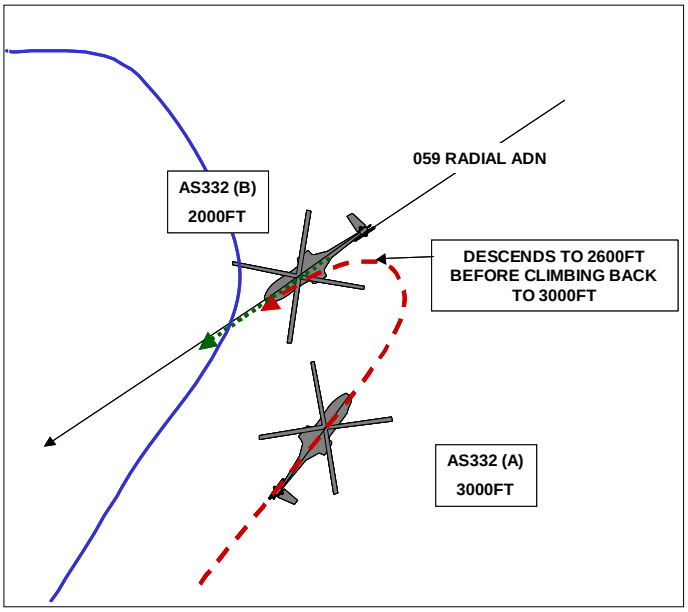
Cause: During a period of high workload and a complex traffic situation, the Heathrow N APP team descended A319(B) into conflict with A319(A).

Degree of Risk: C.

## AIRPROX REPORT No 051/08

## AIRPROX REPORT NO 051/08

| | | |
|---|---|---|
| *Date/Time:* | 29 Apr 0729 | |
| *Position:* | 5720N 00120W (40NM NE Aberdeen) | |
| *Airspace:* | Aberdeen OSA | (Class: G) |
| *Reporter:* | Aberdeen ATC | |
| | *1st Ac* | *2nd Ac* |
| *Type:* | AS332 (A) | AS332 (B) |
| *Operator:* | CAT | CAT |
| *Alt/FL:* | 3000 ft (QNH 998 mb) | NK |
| *Weather* | VMC CLAC | NK |
| *Visibility:* | >10KM | NR |
| *Reported Separation:* | 600ft V/0.5nm H | NK |
| *Recorded Separation:* | 600ft V /1.6nm H (from ATSI report) | |




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

**THE ABERDEEN HELS CONTROLLER** reports that at the time of the incident the traffic loading was medium.

At about 0725, AS332 (A), which was level at 3000ft outbound from Aberdeen, requested to return with a slight technical problem. He asked the pilot if he was going to declare a Minor Technical Problem (MTP), a unique definition to Aberdeen, to indicate a problem with the ac that does not warrant a PAN call. The pilot declined to declare a MTP, which was confirmed.

At the time there was an inbound helicopter [AS332 (B) level at 2000ft tracking in the opposite direction to AS332 (A)]. He instructed AS 332 (A) to return to BALIS [5nm NE of the Airport], right or left turn at the pilot's discretion, and to enter the zone VFR via BALIS not above 1000ft. He knew that after the turn although the ac would be very close to one another laterally, they would be vertically separated by 1000ft. He also knew that there were no outbound ac at 3000ft behind AS332 (A) so his intention was to let AS332 (A) turn, see where the ac was laterally in relation to AS332 (B), try to get them visual with each other or separate using radar headings prior to issuing a descent clearance to get AS332 (A) back to the conventional altitude of 2000ft for an inbound helicopter. He issued the clearance at the time, as it is a standard procedure, since the ac was in receipt of a 'Modified RAS' (MRAS) in accordance with which it should not change level without first requesting the change. (This normally takes place at the top of descent point).

He looked away from the ac to continue his radar scan and deal with another issue. He then looked back to see which way AS332 (A) was turning with the intention of giving TI which would get the respective pilots visual with each other's ac thus allowing the use of the visual separation permitted under the MRAS service. He then noticed that AS332 (A) had started to descend without informing him of any change; he recalls seeing a descent arrow and Mode C indicating 2600ft. At that point he believes that he issued an avoiding action of immediate climb to 3000ft and told the pilot about the presence of AS332 (B) to which he also passed TI about AS332 (A) which was in his 12 o'clock at less than 1.5 miles and 500ft above; the pilot responded that he was visual with the other AS332. He could not recall whether he passed avoiding action to the pilot of AS332 (B) as he thought the pilot was visual with the ac and could take his own separation on AS332 (A) which was passing 2700ft in a rapid climb back to 3000ft. At the closest point the ac were separated by about 1.3nm and 500ft.

He asked the pilot of AS332 (B) if he wished to file an Airprox and he declined. He informed the pilot of AS332 (A) that he would be reporting a level bust. However, on reflection and having seen the relative positions of the ac after the incident he decided to file the report as an Airprox.

**AS332 (A) PILOT** reports that while 40nm outbound from Aberdeen level at 3000ft and 135kt, to intercept the 059º radial from ADN at 80nm, a return was initiated due to a minor technical problem. (TCAS was not fitted). After requesting a return from ATC, he believed that his clearance was *"left or right turn, direct to BALIS, not above 1000ft".* He initiated a left turn and after becoming visual with land passing through the nose he commenced a descent to 1000ft. The proximity to Aberdeen led him to believe that he had been given a descent clearance as during a standard VFR approach to Aberdeen, he would have already commenced a descent to 1000ft by this stage of the approach. At 2600ft ATC informed him that he had not been given a descent clearance and advised him of an opposite direction ac. He then initiated a climb back to 3000ft. During the climb the opposite direction ac was seen below and to the right of the ac.

**AS332 (B) PILOT** declined to file a report (it is understood that he considered there was not an Airprox).

**ATSI** reports that the Aberdeen Hels Controller described his workload as low to medium and that he had been in position for about 30min prior to the Airprox.

The level conventions stated in the Aberdeen MATS Part 2, Page HEL 3.1 are: *'Aberdeen ATC will assign 1000ft and 3000ft to outbound helicopters, and 2000ft (or quadrantal flight levels which provide 1000ft separation against 3000ft outbounds) to inbounds.'*

AS332 (A), outbound from Aberdeen at 3000ft, established communication with the HELS Controller at 0715. The pilot was informed he was identified and placed on a Modified RAS (MRAS) outside CAS. He was requested to report at 80nm, which he estimated at 0748. There is a MOU between ATC and the three local offshore support helicopter operators for the provision of MRAS. This is defined as: '*The following modifications to RAS define the MRAS, which may be provided to helicopters of the signatory companies (the specified helicopters). The aim of the Aberdeen ATSU will be to provide 'Standard Separation'. However, when tactically advantageous, the following separations may be offered within North Sea Airspace: '500ft vertical separation together with associated traffic information. NB. This separation will only be accepted under VMC conditions. Or, for participating traffic operating at the same level on either converging, following, or overtaking tracks, traffic information together with pilot confirmation that visual contact exists with the conflicting traffic. The pilot then assumes the responsibility for maintaining adequate separation from the conflicting traffic in accordance with the Rules of the Air.'*

AS332 (B) contacted the HELS frequency at 0723. The pilot was given a squawk and the Aberdeen QNH. He reported *"just lifted Galaxy Three and just passing eight hundred for one thousand initially with twelve souls looking for VFR back at Aberdeen at and requesting climb two thousand feet"*. The helicopter was identified bearing 058° from the ADN at a range of 50nm, was provided with a MRAS and instructed to climb to 2000ft. Shortly afterwards the pilot reported maintaining 2000ft, estimating Aberdeen at 0749 and requesting VFR. He was instructed *"route direct to BALIS enter the zone via BALIS VFR not above altitude one thousand feet"*.

At 0727:28, AS332 (A) [outbound] requested to return to Aberdeen *"with just a slight technical fault"*. At the time, the subject helicopters were 8nm apart, on reciprocal tracks. Because the controller did not know the helicopter's problem and there was no following traffic at 3000ft, he gave the pilot the option of a right or left turn and asked if he anticipated approaching VFR. The controller said he realised that the two helicopters would come close laterally if AS332 (A) made a left turn (which it did) but he had [a minimum of] 1000ft vertical separation between them. The VFR approach was confirmed and the controller responded *"roger right or left back direct to BALIS to enter the zone VFR not above altitude one thousand feet do you want to declare that as a minor technical problem"*. The pilot replied *"To BALIS VFR not above one thousand feet and it's just a s- a slight technical problem nothing nothing to be concerned about"*. ATSI Note: The term Minor Technical Problem has a specific meaning agreed with the locally based helicopter operators. It is used when pilots do not wish to make a PAN or MAYDAY call but would like an RFFS presence. By then the subject helicopters were about 5nm apart. The controller then turned his attention to traffic operating in another part of his sector. About one minute later he noticed that AS332 (A) had commenced a descent from 3000ft and he was concerned at first that this may have been an emergency descent because of the helicopter's problem which might, he thought, even result in a ditching. He transmitted to the pilot *"I didn't actually give you any descent sorry you've gone down to two thousand six hundred"* and the pilot replied that he was happy to remain at 3000ft and reported turning for BALIS. The controller responded *"C/S climb immediately there is traffic off on your right hand side five hundred feet below your current level range of less than one mile"* to which the pilot replied *"passing two thousand seven hundred climbing three thousand and in a left turn back towards BALIS"*. TI was then passed to AS332 (B) *"do you have that aircraft just about less than a mile and a half ahead he's back up to three now"* and the pilot replied *"yeah we've just noticed him"*. The phrase 'avoiding

action' was not used to either flight. The controller explained that he did not issue it to AS332 (A) as he thought that it might have an emergency and additionally, because AS332 (A) had climbed quickly back to 3000ft, the situation was resolved by the time he was able to pass TI to AS332 (B). The controller commented that when helicopters are inbound at 4000ft or above, he usually requests pilots to 'report ready for descent' but he was not sure why he had not carried out the procedure on this occasion. However, the MATS Part 1, Section 1, Chapter 5, Page 3, (also the UK AIP, Page ENR 1-6-1-2) states that under a RAS *'The controller will be advised before a pilot changes heading or level'* (there is no modification within the MRAS agreement altering this responsibility).

The radar recordings show that at 0729:10 the separation between the helicopters was 500ft/1.9nm; at 0729:26 600ft/1.6nm and at 0729:35 vertical separation was 1000ft. Subsequently, in accordance with the MRAS, AS332 (A) descended visually through AS332 (B)'s level.

The pilot of AS332 (A) stated in his report that he believed he had received a descent clearance. Although the clearance issued on this occasion was one normally used at Aberdeen without problems in the past, with hindsight it is open to ambiguity. Accordingly, since this Airprox, Aberdeen ATC has produced a Supplementary Instruction (SI 11/08). 'A recent incident has highlighted the potential ambiguity of the standard zone clearance issued to aircraft requesting a VFR or SVFR arrival at Aberdeen. It is possible that a pilot could interpret phraseology such as "Cleared to enter the zone VFR not above 1000ft" as a clearance to descend to 1000ft or below at a time of their choosing, without further reference to ATC. It is obviously important that all ATC clearances leave no room for misunderstanding, and to that end the phraseology used to issue VFR zone clearances must be as per the procedure below, which will be incorporated in MATS Pt 2.' Procedure: 'A clearance must be issued to all aircraft intending to enter controlled airspace VFR/SVFR. However, unless the pilot requests otherwise, IFR flights will remain IFR until they enter the CTR/CTA. For flights receiving a RAS/MRAS, when the clearance includes a level restriction which requires the aircraft to descend before reaching the zone boundary, pilots must be left in no doubt as to whether or not they have been cleared to descend at the time the clearance is issued. If the aircraft is not cleared to descend, the phrase *"Maintain (altitude or level)"* must precede the zone clearance. After a correct readback of the clearance, the pilot must be instructed to report ready for descent. Example: *"AS332 (B), Maintain 2000ft. Cleared to enter the zone at HAK, not above altitude 1000ft, VFR"*. After a correct readback is received from the pilot: *"C/S readback correct, report ready for descent"*.'

Issuing the standard VFR joining clearance in advance would appear to have been the normal way of operating at Aberdeen, presumably without any problems in the past. However, the procedure is considered open to ambiguity as shown on this occasion and it is welcome that the issue has been addressed locally. Notwithstanding that the pilot did not report descending and the early issuance of joining clearance appeared to be standard, the controller passed an ambiguous instruction. Further, had he requested the pilot to report ready for descent, the incident would have been prevented.

## PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilot of AS332(A), transcripts of the relevant RT frequencies, reports from the air traffic controller involved and reports from the appropriate ATC and operating authorities.

Members considered that, although the pilot of AS332(B) was adamant that the situation did not warrant Airprox action, the Hels Controller had reported the incident as an Airprox and the pilot should therefore have co-operated by completing a report. Notwithstanding that however, the Board had sufficient information from other sources to investigate the incident fully.

There was general agreement both among pilot and controller Members that the clearance passed by the Hels Controller, although standard, was open to interpretation and could easily have been interpreted as a clearance to 'descend at the pilot's discretion to be at 1000ft when entering the Aberdeen CTR/CTA', just as AS332(A) crew did.

The controller however spotted that AS332(A) was descending and by reacting swiftly prevented the ac from flying into close proximity.

The Board welcomed the timely follow up action taken by Aberdeen ATC which should prevent any recurrence. They were also informed by the NATS Advisor that the MTP procedure had now been discontinued.

## PART C: ASSESSMENT OF CAUSE AND RISK

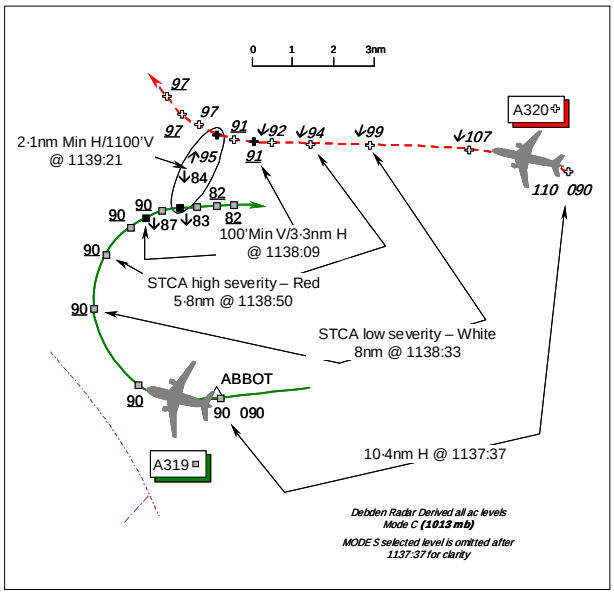
Cause: Having mistaken his Zone entry clearance as a clearance to descend, the crew of AS332(A) descended into conflict with AS332(B).

Degree of Risk: C.

## AIRPROX REPORT NO 052/08

| | | |
|---|---|---|
| *Date/Time:* | 30 Apr 1139 | |
| *Position:* | 5207N 00035E (5½nm N of ABBOT) | |
| *Airspace:* | London TMA | (Class: A) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | A319 | A320 |
| *Operator:* | CAT | CAT |
| *Alt/FL:* | FL90 | ↓FL90 |
| *Weather* | IMC In Cloud | IMC In Cloud |
| *Visibility:* | Nil | NR |
| *Reported Separation:* | | |
| | 200ft V/Nil H | 400ft V/2·5nm H |
| *Recorded Separation:* | | |

100ft Min V @ 3·3nm H
2·1nm Min H @ 1100ft V




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

**THE A319 PILOT** reports he was the PF whilst inbound to London Stansted and in receipt of a RCS from ESSEX RADAR on 120·625MHz. Outbound in the holding pattern for ABBOT heading 090°(M), flying level at FL90 at a speed of 220kt, he heard the controller give an instruction to another flight - the A320 – to "turn onto 360° - avoiding action". Another ac was displayed by TCAS on the navigational display as 'proximate traffic' descending towards his ac in his 11o'clock position about 5nm away. As a precaution, he ensured his hand was "covering" the sidestick. The crew of the other flight - the A320 - appeared not to respond to the controller's instruction but there were many 'blocked' simultaneous RT transmissions. ESSEX RADAR then instructed him to descend to FL80 for 'avoiding action'. After disconnecting the autopilot he initiated the descent whereupon TCAS enunciated a DESCEND RA with which he complied. The other ac, which was not seen visually, was displayed some 200ft above his ac before TCAS enunciated CLEAR OF CONFLICT at about FL83. During this manoeuvre the A320 crew was heard to report a TCAS CLIMB.

He assessed the risk as *"high – very high"* and added that although his workload was *"low"* the RT was busy.

**THE A320 PILOT** reports he was inbound to London Luton and in receipt of a RCS from ESSEX RADAR. After one holding pattern at ABBOT, he thought, they were instructed by ATC to turn onto a heading of 320° and descend from FL110 to FL100. When 7nm abeam their planned track they were turned onto 275° and flew for about 1min before being instructed by the controller to turn onto a heading of 240° and descend to, he thought, FL80 [actually FL90]. At 220kt in a shallow descent through, he thought, FL88 [more probably FL98] at about 1100ft/min, TCAS enunciated a TA - TRAFFIC. ESSEX RADAR then instructed them to turn onto 360° but "obviously too late". Whilst in the turn TCAS enunciated a CLIMB RA; at that moment they were at FL87 he thought [the radar recording shows that the ac's descent bottomed out at FL91], and started to climb in accordance with the TCAS 'command'. During the avoiding action manoeuvre they reported the TCAS CLIMB RA to ATC. The 'intruder' – the A319 - was displayed 600ft below them, about 3nm ahead and to port. At FL94 the TCAS RA ceased and, with ATC clearance, they climbed back up to FL100 again. Minimum separation was 400ft vertically and 2½nm horizontally. The Risk was assessed as *"Medium"*..

The crew of the A319 was then heard to make a report on the RT, which is obligatory after this type of situation in his company also. After the flight he filed an Air Safety Report and personally delivered it to his base Safety Pilot.

**THE LTC STANSTED INTERMEDIATE DIRECTOR/ESSEX RADAR** controller reports in two separate accounts that he took over the position at about 1115 with a medium level of traffic. However, he had identified before taking over that an increase of traffic was pending that would require a separate controller to operate the Stansted SUPPORT Position in 10min time and this was verbally requested from the Group Supervisor Airports [GS

(Airports)] just before he took over the Sector. Unfortunately, SUPPORT remained unmanned and at 1140 he became overloaded with RT calls and telephone calls whilst issuing both vectoring instructions and managing aircraft in the holds. Whilst in the middle of a phone call, a colleague manning the Stansted FINAL position brought to his attention that he had a conflict at ABBOT and he immediately noticed the red STCA alert against the A320 and the A319. He gave avoiding action instructions to the A320 crew but heard no reply and then gave avoiding action instructions to the A319 crew. Again no reply was heard but there may have been crossed transmissions. He then heard another flight, believed to be ac3 [a B737], confirming that he was taking a radar heading of 360° which was the heading he had previously transmitted to the A320 crew. A repeat of the avoiding action instructions was then attempted but again, crossed transmissions may have prevented the pilots from hearing them. He believes that the crews of both ac then called stating they were taking TCAS action so he advised them to report when back under his control. This resulted in a loss of separation between the A320 and the A319 at FL90 in the vicinity of the ABBOT hold. When both ac were clear of confliction he continued vectoring them inbound. Some 3min later a relief controller arrived.

**THE LTC GROUP SUPERVISOR AIRPORTS [GS (AIRPORTS)]** reports that the ESSEX RADAR Sector had been busy during the morning with 3 positions manned up until 1050. SUPPORT was then closed during a quieter spell. He had noticed that it was going to get busier again within 30min and the ESSEX RADAR controller soon informed him that SUPPORT might need manning again. The staffing situation was both complex and tight; one controller - Controller B - had just commenced a break after working for about 90min and another - Controller D - was working Gatwick. So the best option was to utilise Controller E who was working Luton Intermediate DIR but had only been in position for about 10-15min. Controller F was recalled from a short break to relieve Controller E working Luton DIR but he did not appear until 1130. He asked Controller E to have a *"very quick break"*, then to return and open SUPPORT. Controller E returned to the Ops Room just after the loss of separation had occurred and then relieved the subject ESSEX RADAR controller. Steps were then taken to reduce the workload, with TC North holding traffic in the LOREL/ABBOT holds. Throughout this period the Operational Position Monitoring (OPM) computer was OOS and it was not possible either to monitor real time working hours or obtain retrospective reports. His own workload was *"very high"*, with issues involving an earlier Heathrow RW change, subsequent EATs and liaison with THAMES RADAR relating to landline maintenance.

**ATSI** reports that this Airprox occurred during a period when the LTC ESSEX RADAR controller reported being 'overloaded'. Immediately before the controller had taken over the position he had informed the Group Supervisor Airports [GS (Airports)] that the position would require splitting, i.e. a SUPPORT Controller was needed, to be plugged in within the next 10min.

The GS (Airports) was fully aware of the number of staff available and was carefully managing staff to meet the traffic needs. Common practice at the unit is to avoid a direct swap from one location to another without some intervening break, if at all possible. The manning on Stansted had been split three ways (ESSEX, SUPPORT and FINAL DIRECTOR [FINAL]) between 1005 and 1050 and the subject controller had undertaken a period of 45min operational duty in the SUPPORT position prior to taking a 28min break before plugging in again at 1118 as ESSEX. Controller B had just completed 90min operational time and Controller C was already operating as FINAL.

The GS (Airports) had 3 options: recall Controller B to work up to his permitted SRATCOH hours; relieve Controller D from an operational position on Gatwick; or, relieve Controller E from an operational position on Luton. The third option was chosen and another Luton controller (Controller F) was paged to return from a break started 20min previously to relieve Controller E. The GS (Airports), cognisant of the preference not to move a controller from one location to another without an intervening break, was aware that Controller E had been operational for less than 30min and had thus been offered a 'short break' before returning to fulfil the role of Stansted SUPPORT. This task being done, the GS (Airports) applied himself to other duties.

At 1132:50, the A319 crew contacted ESSEX RADAR and reported descending to FL100 inbound to ABBOT for Stansted. The controller advised the crew to take up the hold, expect a 5min delay and to reduce their speed to 220kt. This was correctly acknowledged and, shortly afterwards, the A319 crew was instructed to descend to FL90. At 1134:35, the crew of the A320 called and reported descending to FL110 on course for ABBOT, inbound to Luton. At this time the A320 was passing FL117 some 10nm behind the A319. The ESSEX RADAR controller instructed the crew to turn R heading 290º in order to take it N of its present track to descend below traffic holding at LOREL and Stansted outbounds. At 1137:20, when the A319 was level at FL90, the A320, which was maintaining FL110, was in the A319's 5 o'clock - 11nm. At 1137:30, the controller instructed the A320 crew to turn

L heading 270º and descend to FL90. Shortly afterwards the A319 reached ABBOT and turned R to enter the hold (inbound QDM 268º right hand).

At 1137:30, the crew of a B737 called descending in the LOREL hold. The ESSEX RADAR controller immediately cancelled the hold and the B737 crew were instructed to turn onto a heading of 060º and descend to FL90. Just under 1min later, at 1138:34, the controller instructed the B737 crew to turn L heading 050º and this coincided with STCA activating at low severity [white] between the A319 and the A320. Without pausing and in mid-transmission to the B737, the ESSEX RADAR controller transmitted at 1138:40,"..[A320 C/S] *turn right immediately heading 3-6-0*", but the response was "*heading 3-6-0 now?* [B737 C/S]". The controller then transmitted "*No* [A320 C/S] *avoiding action turn right heading 3-6-0 degrees climb…..please flight level 1 hundred expedite climb*". The controller followed this with "[A319 C/S] *expedite descent flight level 8-0* [A320 C/S] *break climb flight level 1 hundred*". STCA had changed to high severity [Red from 1138:50] during these exchanges as the A319 was turning R to intercept the outbound leg of the ABBOT hold and the A320 was still heading W. Separation, as determined by the unit [using the Stansted 10cm Radar] reduced to a minimum of 2·5nm and 400ft. At 1139:10, the controller again tried to give an avoiding action turn to the A320 crew R onto 360º but they responded that they were following a *"..TCAS CLIMB"*. Shortly after 1139:20, the A319 crew reported a *"..TCAS DESCENT"* RA.

The unit investigation determined that the situation was resolved by both ac positively responding to TCAS RAs and that there was no evidence to indicate that either crew had complied with the avoiding action passed by the radar controller.

The Vertical Stack List showed the confliction but the controller had it selected on an adjacent position and not on his own radar display. During the unit investigation he fully acknowledged that he had forgotten the A319 in the ABBOT hold when he instructed the A320 crew to fly a heading of 270º and descend to the same level as the A319.

The investigation also examined why, although requested by the subject ESSEX RADAR controller, no SUPPORT controller was in place at the time of the incident which was 20min after the ESSEX RADAR controller had requested one to be in situ within 10min of him taking the position. The GS (Airports) had decided to take Controller E out of the Luton INTERMEDIATE DIRECTOR (Luton INT) position, which he had only occupied for some 10–15min, to open SUPPORT. Another controller, Controller F, was called back to take over Luton INT from Controller E but he did not arrive until 1130. Controller E was asked to take a very quick break but the controller did not recall being asked by the GS (Airports) to open up the Stansted SUPPORT position: he interpreted the request as a routine changeover and not one of high priority. He took a break lasting some 15min and then, upon return, initially started to take over the Stansted FINAL position. He withdrew from this to take over from the subject ESSEX RADAR controller when he saw that an incident had occurred.

The ESSEX RADAR controller reported that he was concerned at the lack of appearance of a SUPPORT controller and he turned around to the GS (Airports)'s desk to remind him but could not see him. He was not sure where the GS (Airports) was and so continued with his tasks. Although he could have telephoned the GS (Airports), ESSEX RADAR found himself getting busier and slowly became overloaded. He said frankly that his scan was reduced and he was unable to plan ahead and slowly began to lose the picture. At the moment he erroneously instructed the A320 crew to descend to FL90, he found himself too busy to check the strips and this is possibly why the Airprox occurred.

UKAB Note (1): Whilst not that displayed to the ESSEX RADAR controller, the Debden Radar recording illustrates the encounter clearly as the A319 is shown turning R outbound in the ABBOT hold at 1137:37, with the A320 approaching from the E turning L onto W moments before initiating a descent from FL110. The activation of STCA at low severity is shown from 1138:33 as the A320 descends through FL99 some 8nm distant as the A319 turns about through N. High severity is activated at 5·8nm range at about 1138:50, with the A320 some 400ft above the A319. Minimum vertical separation of 100ft is shown as the A320's descent 'bottoms out' at FL91 - at a range of 3·3nm - just before stipulated horizontal separation was eroded. On the next sweep the A319 is shown descending through FL87 in compliance with the reported TCAS DESCEND RA – which was complementary to the ESSEX controller's avoiding action descent instruction. Minimum horizontal separation of about 2·1nm is shown at 1139:21. However, by then the A320 crew were responding to their TCAS CLIMB RA, climbing through FL95, some 1100ft above the A319 which was simultaneously descending through FL84. The ac then rapidly diverge.

UKAB Note (2): In conformity with the ESSEX RADAR controller's instruction to the A320 crew at 1137:30 to descend to FL90, the 'line 2' for the A320 Mode S Selected Level [SEL] displays FL90 7sec later. This SEL is shown clearly in the Vertical Stack List (VSL) for ABBOT which was only displayed on an adjacent position and not that of the ESSEX RADAR controller. STCA is displayed both on the radar display and also the VSL.

UKAB Note (3): The Unit conducted an extremely thorough investigation into this Airprox covering many aspects in detail in their 17 page report. It is considered impractical to reproduce this here but some of the salient points covered were: a TCAS assessment; an overload assessment; frequency occupation; Sector Manning, the lack of a SUPPORT controller and OPM; actions of the GS (Airports) and Group Supervisor tasks; use of the VSL; Human Factors. The report arrived at several sound conclusions, one being that the likelihood of the Overload and possibility that the Airprox might have been avoided had the SUPPORT controller been in position at the time requested by the ESSEX RADAR controller. Four recommendations were made concerning a review of: the Group Supervisor Airport position encompassing workload, responsibilities, ancillary tasking, training, recency and role in pastoral care; the current policy on the completion of operational position recording; the Group Supervisor Airport's terms of reference with regard to compiling EATs for Heathrow; the policy that Vertical Stack Lists should be displayed where stack management is part of the role should be re-considered to define whether it is sufficient for the VSL to be displayed at an adjacent unmanned position.

## 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 some of the air traffic controllers involved and reports from the appropriate ATC Unit and ATS authority.

Whilst the underlying background to this Airprox had been shown to be somewhat complex, the nature of the close encounter itself was readily apparent to the Members from the ESSEX RADAR controller's own laudably candid account and the comprehensive analysis provided by ATSI. Clearly, the ESSEX RADAR controller had become overloaded. Whilst in the middle of a phone call, the Stansted FINAL controller had warned him about the conflict at ABBOT whereupon he immediately noticed the STCA alert and the conflict between the A320 and the A319 which had not been spotted beforehand. This conflict had stemmed from the instruction issued to the A320 crew to descend to FL90. It was evident from the respective reports that the controller had forgotten about the A319 in the hold at this level which, as this ac turned R outbound at ABBOT, led to a loss of separation against the A320. The ATSI report had made it plain that because the controller had become overloaded his scan was reduced and he had been unable to plan ahead. At the critical moment that ESSEX RADAR erroneously instructed the A320 crew to descend to FL90, he found himself too busy to check the flight progress strips which, if he had done so, would have readily revealed the confliction to him. The Board concluded that the nub of this Airprox was that the ESSEX RADAR controller descended the A320 into conflict with the A319. The ATSI report stated that ESSEX RADAR was operating under an overload situation, the reason for which was plain to Members – he had requested a SUPPORT controller to be plugged in within 10min and none had been forthcoming. Therefore, it was evident that this intensive traffic scenario had been foreseen beforehand, which clearly had a direct bearing on the cause of the Airprox. It was apparent that the ESSEX RADAR controller had correctly assessed what was required and conscientiously made that known to the GS (Airports). Controller Members pointed out that if SUPPORT had been opened within the timeframe requested, this would have allowed the Sector team to 'gear-up' toward the anticipated traffic peak. By then, the oncoming SUPPORT controller would have been well briefed on the traffic situation with this additional controller in situ to take care of other tasks and help Essex RADAR meet the increased traffic loading. Unfortunately, this did not occur here and in the Board's view this was plainly a Supervisory issue which the Unit report had addressed in considerable detail, the Members were briefed. A controller Member validated in this sphere of LTC operations explained that the absolute priority was always to prevent a colleague from being overloaded. There was no choice in the matter at all and controllers were always willing to 'step into the breach' – foregoing a break if necessary – if the situation was made plain. It seemed that GS (Airports) had not made the requirement clear enough when he briefed Controller E to take a "short break", with no period of time specified to the controller before he was to return and open SUPPORT. Conversely, Controller E might have misunderstood what was required of him. Whatever the reason, it seemed that when Controller E was tasked with re-opening the SUPPORT position, he had not been aware of the relatively urgent nature of the situation and had he been so would probably have opened the position earlier. It was significant that the Unit report revealed that Controller E did not recall receiving any direct instructions to open SUPPORT and although aware that Stansted was the next Sector that needed support, Controller E thought this was a routine change-over and not a matter of priority. Accordingly, he took a break of 15min and then returned, initially starting to take over the FINAL position

before relieving the ESSEX RADAR controller after he became aware of the incident. Thus the manning instructions of the GS (Airports) had not achieved the aim of ensuring SUPPORT was opened in good time nor had GS (Airports) realised that a situation was developing as a result of this manning shortfall. Another controller Member intimately familiar with this scenario was surprised that the controller nominated to open SUPPORT had not realised that a traffic peak was looming: moreover, he questioned if the GS (Airports) was himself overloaded. The Board was briefed that the Unit review had covered many areas of the GS (Airports) rôle not least of which was workload and responsibilities. It was evident that here he was completing some tasks – for example, the provision of EATs for Heathrow due to poor weather and a runway change that was impinging heavily on his time – and which he could perhaps have delegated to others. In this complex and busy situation Members recognised that GS (Airports) was working very hard indeed: nonetheless, in fulfilling his primary rôle of ensuring that Sectors were manned to meet the expected traffic flow – which had been accurately predicted – he had not achieved his aim.

Discussion moved to the various aids available to the GS (Airports) to help him man the Sectors appropriately; here the OPM was OOS on the day in question which complicated this task, but clearly he was trying to accede to the accepted practise of allowing a break between controlling on different TC airport Sectors. Thus in the absence of the requested SUPPORT controller, which was clearly a contributory factor here, the ESSEX RADAR controller became overloaded. This overarching factor pre-dominated in the Cause of this Airprox which, Members agreed unanimously, was that during an overload situation the Essex RADAR controller descended the A320 into conflict with the A319.

The Advisor to the Board from NATS Ltd briefed the Members that a considerable number of actions have been taken subsequent to this Airprox. The most significant for controllers was probably that related to the use of the Vertical Stack List (VSL) – as its use was optional at this time. It seemed to the Members that if the VSL had been displayed at the position in use by the Essex RADAR controller it might well have attracted his attention to the conflict at an earlier stage and might well have forestalled this Airprox. The Board was briefed that STCA and Mode S are displayed on the VSL and here the controller was denied the immediate advantage of these valuable tools because the VSL was only selected at an adjacent display and not his own. Henceforth, it had been decided at the Unit to mandate its use at operating positions where the rôle includes stack management, which reassured controller Members.

Turning to the Risk inherent within this Airprox, the Mode S selected level on Line 2 of the Track Data Block, STCA and the VSL were all there to highlight the confliction to the ESSEX RADAR controller but unfortunately in this intense overload scenario, where he had himself reported frankly that his scan was reduced and that he was "losing the picture", he even missed some of these vital cues as the A320 descended and the A319 turned R into confliction. Clearly the crews of these two ac had no impact on the cause of this Airprox; however once the controller realised the true situation there followed a brief period of confusion before TCAS was called upon to act. The ATSI report had reflected that once his colleague had pointed out the confliction to the ESSEX RADAR controller a period of hastily transmitted instructions, coupled with incorrect responses from the wrong flights and crossed transmissions, had prevented the ESSEX RADAR controller's instructions from having any effect whatsoever. Members noted that the Unit investigation had concluded that the situation was resolved by both ac positively responding to TCAS RAs. The Board did not demur from this view; indeed, both controller and pilot Members alike recognised it was the A319 reporting pilot's astute appreciation of the situation and his prompt reaction to the demanded TCAS DESCEND RA coupled with the A320 crew's rapid climb in response to the complementary CLIMB RA that had ensured that vertical separation of 1100ft was restored at the point of minimum horizontal separation of 2·1nm. Moreover, it was unlikely that the westbound A320 and the holding A319 heading E would have flown into close quarters whilst maintaining their respective tracks. This led to unanimous agreement amongst the Members that no risk of a collision had existed in the circumstances conscientiously reported here.

## PART C: ASSESSMENT OF CAUSE AND RISK

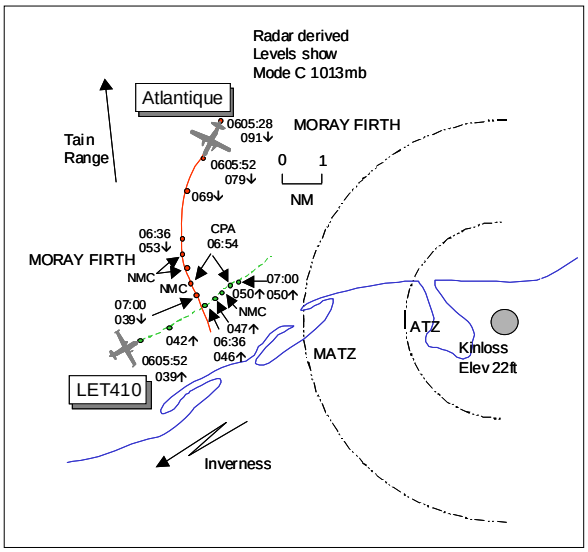
Cause: During an overload situation, the Essex RADAR controller descended the A320 into conflict with the A319.

Degree of Risk: C.

Contributory Factor: The absence of the requested SUPPORT controller.

# AIRPROX REPORT NO 053/08

| | | |
|---|---|---|
| *Date/Time:* | 22 Apr 0607 | |
| *Position:* | 5739N 00347W (11nm NE Inverness) | |
| *Airspace:* | ScFIR | (Class: G) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | LET410 | Atlantique |
| *Operator:* | CAT | Foreign Mil |
| *Alt/FL:* | FL40↑ | ↓ |
| *Weather* | VMC NR | VMC CLOC |
| *Visibility:* | NR | 10km |
| *Reported Separation:* | 500ft V/0·5-2nm H | 500ft V/NR H |
| *Recorded Separation:* | 1nm H | |




## PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

**THE LET410 PILOT** reports outbound from Inverness IFR. During their climb passing through FL40, he thought, on the extended C/L RW05 heading 055° at 135kt, a TCAS TA was received on unknown traffic approaching from their L about 5nm away, below and climbing, he thought; to the N of them was a Military Area, Tain Range, that was active. After establishing visual contact with the ac, a twin-engine military type, the traffic started a descent below them. They continued their climb as this seemed the proper course of action, the other ac passing 0·5-2nm clear on their L and 500ft below.

**THE ATLANTIQUE PILOT** reports returning to Kinloss from a local sortie and in communication with Kinloss Tower; ACAS was not fitted. Previously they had been in contact with Lossiemouth and been receiving a good RAS, with which they were confident, as TI was given on a light ac ahead of them which they avoided with good separation. They were transferred to Kinloss Tower and were cleared for a visual approach which was when the Airprox occurred. Heading 160° at 250kt descending, a high wing twin-engine turboprop ac coloured red/white was seen approaching from their RHS about 1nm away, in level flight. They expedited their descent to avoid it, passing 500ft below it. They complained to Kinloss Tower, the controller stating that he had no radar or information about the traffic. He assessed the risk as medium. He cited that the crew were tired after a long low-level night flying exercise in the Minches.

**THE INVERNESS ADC/APP** reports the LET410 was approximately 10nm NE of Inverness en route direct to Kirkwall and turning E to avoid Tain range when the crew reported coming in close proximity to another ac believed to be military.

**ATSI** reports that no apparent civil ATC causal factors were revealed. The LET410 was being provided with a Procedural Service by Inverness and the subject military ac was unknown to that unit. NB Radar service does not commence until 0900.

**MIL ACC** reports that the Atlantique had completed a night-into-early-morning sortie and was returning to RAF Kinloss (KIS) for a radar to visual approach RW 08. KIS is a non-radar unit and radar vectors are provided to KIS traffic by RAF Lossiemouth (LOS). Any coordination required between KIS and Inverness (INV) ac is conducted by LOS and details of any restrictions are passed to KIS. No controller reports were completed by LOS staff as this Airprox occurred after the Atlantique had left the LOS frequency. The type of service provided by LOS to the Atlantique is unknown.

At 0600:30 the Atlantique flight reported to LOS that they were ready to return to KIS. A visual approach to RW08 at KIS was requested and the flight was given own navigation to KIS with an instruction to report when visual with the airfield. At 0602:14 LOS warned the Atlantique into KIS stating *"…warning back in Atlantique c/s, visual*

*recovery"*. At 0602:54 the Atlantique crew reported visual with KIS, which was acknowledged. At 0603:04 LOS passed TI as *"Atlantique c/s you have traffic right 2 o'clock 7 nm crossing right to left indicating FL70"*. [Not the subject LET410 but another INV outbound] The crew replied *"copied the traffic information but not visual at the time being Atlantique c/s*". About 30sec later, 0603:45, the Atlantique crew reported visual with the traffic. LOS released the Atlantique to KIS *"Atlantique c/s roger, with that traffic in sight continue with Kinloss Tower on 235.02"*. No further TI was passed by LOS either to the Atlantique flight or to KIS. At 0604:14 the Atlantique crew called KIS to join for visual recovery. Standard joining instructions were passed and the flight was instructed to report finals, gear down. At 0606:49 the Atlantique crew reported to KIS *"For information Atlantique c/s we just crossed another aircraft, he is erm above us now at 9 o'clock."* The KIS controller acknowledged the call and stated that the approach was a visual one and that KIS had no radar. The crew replied *"That's copied Atlantique c/s no problem for us"*. The KIS controller then looked at the Hi-Brite screen and saw 2 squawks garbled at 6-7nm W of KIS. A visual check was then made and the Atlantique was seen high and descending to cct height on a S'ly heading with an unknown ac above and to the N of it. KIS had no information on any traffic other than the Atlantique in the vicinity. At 0611:41 INV contacted LOS to inform them that an INV outbound ac was filing an Airprox against an ac squawking 3701 over KIS (the subject Atlantique). During the landline conversation, LOS informed INV that the Atlantique was not on LOS frequency at the time of the Airprox. Basic details of the Airprox were then relayed to KIS for the Atlantique crew.

The Atlantique was conducting a visual approach to KIS (Class G airspace) under a FIS from KIS Tower at the time of the Airprox. TI had been passed to the Atlantique flight by LOS with regard to an ac unrelated to the incident. No TI was passed either to KIS or to the Atlantique flight regarding the LET410 from INV whose flightpath was in confliction.

UKAB Note (1): The radar recording at 0605:28 shows the Atlantique 8·7nm NW of Kinloss tracking 210° descending through FL091. Twenty-four seconds later at 0605:52, as it descends through FL79, the LET410 first appears on radar in the Atlantique's 1130 position range 5·4nm tracking 060° climbing through FL39. The Atlantique is seen to commence a slow L turn passing through a S'ly heading at 0636:36 indicating FL53 as the LET410 passes 1·75nm to its SSE climbing through FL46. Thereafter, the Atlantique rolls out onto a SSE'ly track with its Mode C disappearing for 3 radar sweeps. The CPA occurs at 0606:54 with the LET410 climbing through FL50 in the Atlantique's 0930 position range 1nm. It is apparent that the Atlantique has descended through the LET410's level during this NMC phase as the next sweep at 0607:00 reveals the Atlantique descending through FL39, 1100ft below the LET410.

## 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 Mil ACC Advisor expressed regret to Members for the lack of reports from Lossiemouth and stated that measures have been put in place to prevent a recurrence.

Members agreed that this had been an entirely avoidable incident had Lossiemouth and Inverness coordinated with each other. However, there was some doubt as to whether both units had been aware of each other's activity status as the incident occurred outside of the Lossiemouth promulgated opening hours. During normal operating hours, Inverness would normally inform Lossiemouth of IFR departures whilst Lossiemouth would inform Inverness if they have traffic to effect. Inverness was open at 0530 whereas Lossiemouth open at 0800 although an ATS is available H24.

*Post Meeting Note:* Mil ACC confirmed that Lossiemouth ATC operate 24hr for operational flights only and provide a radar service to all Kinloss traffic as required. An ATS for non-operational flights is only available during promulgated hours with LARS available from 0900 local time onwards.

The ATSI Advisor proffered further information from the Inverness RT transcript which revealed that Inverness telephoned Lossie about 1min after the Atlantique was transferred to Kinloss. The Inverness ADC/APP informed the Lossiemouth controller that both departures, the LET410 and the previous ac, were on assigned codes and were deviating to the E as Tain Range was active, neither pilot being able to contact the Range. The Lossiemouth controller queried the Range activity as he had not been informed of it by the Range but was told by Inverness that it was notified active because of the military exercise. At this time Lossiemouth made no mention to Inverness of

the Atlantique that he had just transferred to Kinloss. The RT transcript revealed that about 1min before the transfer, TI had been passed to the Atlantique crew on the previous Inverness departure but not the LET410 following behind. Thirty seconds later the Atlantique crew had reported visual with the first departure and was transferred to Kinloss for a visual approach. Kinloss Tower cleared the flight for a visual approach but neither ATC nor the Atlantique's crew were aware of the LET410 on a crossing track. Similarly, the Inverness ADC/APP and LET410 crew were also unaware of the Atlantique on a conflicting flightpath. An ATCO Member stated that Inverness outbounds routeing off the ADRs on direct tracks normally work the ScACC Moray Sector for a radar service after being released by Inverness: the LET410 was only transferred to ScACC several minutes post Airprox. However, as the incident occurred in Class G airspace, both crews were responsible for their own separation from other traffic through 'see and avoid'. The Atlantique's crew were undoubtedly surprised to 'meet' the LET410 without receiving any TI, having previously been in receipt of a radar service prior to calling Kinloss. They saw the LET410 approaching from their R, estimated range 1nm, and expedited their descent to avoid it. The radar recording shows that separation was probably much greater on first sighting as the LET410 later passes through the Atlantique's 12 o'clock range 2nm prior to the CPA occurring. The LET410 crew was alerted to the Atlantique's presence by a TCAS TA at range 5nm before visually acquiring the latter and they elected to continue their climb whilst watching it as it descended to pass below and behind. Taking all of these elements into account, the Board concluded that this had been a conflict in Class G airspace resolved by both crews whose actions removed any risk of collision.

Owing to the lack of exchange of TI between Lossiemouth and Inverness when the Atlantique was working Lossiemouth and in potential conflict with the two Inverness outbound flights, the Director was tasked by Members to write to both Inverness and Lossiemouth ATSUs to request a review of the LoA to ensure that there is no doubt as to when each unit is open and that each unit is aware of the other's traffic situation.

## PART C: ASSESSMENT OF CAUSE AND RISK

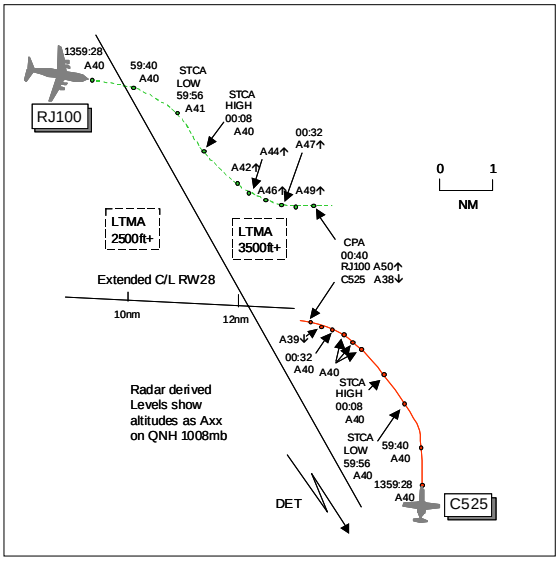
Cause: Conflict in Class G airspace resolved by both crews.

Degree of Risk: C.

## AIRPROX REPORT No 054/08

## AIRPROX REPORT NO 054/08

| | | |
|---|---|---|
| *Date/Time:* | 1 May 1401 | |
| *Position:* | 5130N 00028E (12nm NW DET) | |
| *Airspace:* | LTMA | (Class: A) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | RJ100 | C525 |
| *Operator:* | CAT | Civ Comm |
| *Alt/FL:* | 4000ft | 4000ft |
| | (QNH 1008mb) | (QNH) |
| *Weather* | VMC CLOC | VMC NR |
| *Visibility:* | 15km | |
| *Reported Separation:* | | |
| | Nil V/3nm H | Not seen |
| *Recorded Separation:* | | |
| | 1200ft V/2·1nm H | |




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

**THE RJ100 PILOT** reports following a DVR 3T departure from London/City under the control of Thames Radar on 132·7MHz squawking with Modes C and S. They had been cleared to climb to 4000ft but were not given a radar heading. Just after completing a turn to intercept the 155° track to DET level at 4000ft at 240kt, Thames Radar issued avoiding action of a L turn onto heading 060° and immediate climb to 6000ft, he thought. These instructions were complied with and the opposing traffic was also given avoiding action, the RJ100's climb being subsequently stopped at 5000ft. TCAS was monitored and the conflicting traffic was noted in a turn about 3nm away at the same altitude. They attempted to visually acquire the traffic but once established in the turn this was not possible. During the turn, a TA alert was received but subsequently cleared; no RA was triggered. At the time Thames were busy with ac avoiding weather in the London area. They were monitoring the weather radar for their departure route, just keeping clear of a line of weather to the E. Once the conflict cleared, their priority was again Wx avoidance as the avoiding action had turned them towards a 'build up' but unfortunately RT congestion meant that this could not be achieved before the ac suffered a lightning strike. No systems were affected and following verification of this the flight continued normally. Thames confirmed that they would be filing on this incident stating that they had correctly followed the SID but owing to workload the Thames controller had mistakenly believed that he had placed their flight on a heading. He assessed the risk as medium.

**THE C525 PILOT** reports inbound to London/City at 4000ft and 200kt and in communication with London [actually Thames Radar] squawking with Modes C and S. Routeing from the S, the controller ordered an immediate descent and a vector with which they complied. They did not see the other ac so were unable to recognise the hazard situation.

**ATSI** reports that at the time of the Airprox, Thames Radar was operating in a split configuration with the Heathrow SVFR position manned but no Coordinator in place. The C525 was inbound to London/City from Farnborough and called the Thames Radar controller at 1354:20, reporting at 5000ft and routeing direct to DET. The controller instructed the crew to descend to 4000ft and to leave DET heading 300° before amending the heading to 320°. The crew acknowledged this and were advised that they could expect an ILS approach to RW28.

The RJ100 crew called the Thames Radar controller at 1356:10, reporting level at 3000ft and following a DVR 3T departure from London/City. At 1356:40, the C525 crew reported turning at DET and were instructed to maintain 200kt. The controller then instructed the crew to turn R heading 360° before instructing the RJ100 crew to climb to 4000ft. At this time, the RJ100 was still tracking E on the SID and the C525 was 17nm SE of it.

The C525 crew were instructed to reduce to 180kt and, at 1359:30, to turn L heading 320° and report established on the LLZ. Approximately 10sec later the RJ100 crew, still following the SID and level at 4000ft, commenced a R turn of some 70° to intercept the DET R335. At 1359:55, STCA activated at low severity as the two ac were

head on, same level, at a range of 7·1nm. The controller instructed the RJ100 crew to turn L heading 090° before transmitting "*(RJ100 c/s) avoiding action turn left heading zero six zero degrees climb immediately altitude five thousand feet*". The crew acknowledged this but read back the level incorrectly as 6000ft. Although the controller had detected this he opted to give an avoiding action descent to 3000ft to the C525 crew rather than correct the wrong level. Unfortunately, the crew of the C525 responded with "*(C525 c/s) did you call*" and so the controller had to repeat the descent instruction. Minimum separation recorded by the Unit was 2·5nm and 700ft.

[UKAB Note: The CPA occurs at 1400:40 with the RJ100 turning through an E'ly heading climbing through altitude 5000ft passing 2·1nm N of the C525 which is descending through altitude 3800ft.]

Interaction between the SID and arrivals for London/City is inevitable as inbound traffic is released at 5000ft for descent and vectoring to final and outbound traffic is initially restricted underneath but has to be climbed to 5000ft before transfer to TC. In common with standard practice, the controller normally placed traffic following a DVR 3T SID on a heading to avoid the confliction point: however, on this occasion, he omitted to. Weather had just started to affect his airspace and he was concentrating on another part of the sector where weather avoidance was becoming a problem.

## PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The NATS Advisor informed Members that new SIDs should be implemented for London/City in March 2009 which are intended to reduce the current risks surrounding the requirement for Thames Radar controllers to vector all departures as in the current airspace design. However, to reduce the risk of reoccurrence in the short term, an OPNOT was produced highlighting the need for Thames Radar controllers to monitor departure tracks to ensure separation from inbound ac and this was also highlighted to Thames LCEs.

ATCO Members fully understood this type of situation when, during periods where Wx avoidance becomes an issue, the controller's workload increases. The Thames Radar controller had concentrated his attention on another part of the sector and had simply forgotten to place the RJ100 on a radar heading, which normally aims such flights towards a 'gate' to the N of DET, and allowed the flight to continue to follow the SID. In doing so, he did not ensure standard separation between the RJ100 and the C525 and this had caused the Airprox.

The Thames Radar controller had spotted the RJ100's turn and issued instructions to both crews to resolve the deteriorating situation. Members were disappointed that although the Thames controller had used the 'avoiding action' phraseology, the RJ100 crew had read back the wrong altitude (later corrected by the controller) and the C525 crew had replied 'did you call?'. Members opined that some aircrews flying predominantly in CAS might not be used to hearing this phraseology. Furthermore, with respect to foreign aircrew, the UK does not use ICAO standard phraseology, the inclusion of the words 'avoiding action' being a UK difference. The RJ100 crew had reacted quickly to the issued turn and climb instructions and, whilst manoeuvring, saw the C525 on TCAS turning away at the same time as receiving a TCAS TA. The Thames controller repeated the avoiding action descent instructions to the C525 crew which they acknowledged and actioned. The radar recording shows the RJ100 turning L and quickly climbing above the C525 which is also turning L onto the LLZ before descending immediately prior to the CPA. These combined elements were enough to allow the Board to conclude that any risk of collision had been quickly and effectively removed.

## PART C: ASSESSMENT OF CAUSE AND RISK

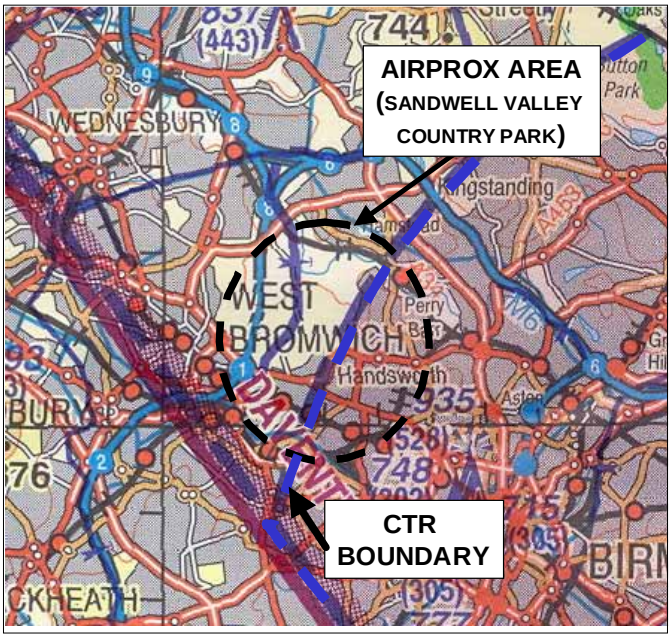
Cause: The Thames Radar controller did not ensure standard separation between the RJ100 and the C525.

Degree of Risk: C.

## AIRPROX REPORT No 055/08

## AIRPROX REPORT NO 055/08

| | | |
|---|---|---|
| *Date/Time:* | 2 May 2150 | |
| *Position:* | 5232N 00156W | (8nm NW of BHX) |
| *Airspace:* | Lon FIR/B'ham CTR | (Class: G/D) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | EC135 | Unknown |
| *Operator:* | Civ Pol | NK |
| *Alt/FL:* | 1500ft (QNH 1022mb) | NK |
| *Weather* | VMC CAVOK [no cloud, no moon wind 4kt] | |
| *Visibility:* | >30km | |
| *Reported Separation:* | NR | |
| *Recorded Separation:* | NR | |




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

**THE EC135 PILOT** reports flying a routine night police surveillance task on the edge of Birmingham CTR squawking 0060 with Mode C and in receipt of a RC service from them. He was operating around 1500ft on the QNH and initially in an orbit at 80kt when the front observer saw unidentified lights flying around their ac. The pilot established visual contact, he estimated 100m away but it was very difficult to tell, as he manoeuvred the ac to avoid a collision and to identify the light source.

The lights appeared to continue to circle their ac the same height, flew away to the N slightly then returned. Contact was broken by flying E to Birmingham City and descending to a lower height to enable the lights to be seen against the dark sky but the other ac returned to their area.

They searched the open land in the area below them with their thermal camera looking for any signs of radio-controlled model activity but nothing obvious was found.

He believes the lights may have come from a radio controlled fixed wing ac, the lights being to assist with night flying, and that it was purposely flown around them. He also thought that the intent may either have been sinister, or just someone "messing around". He informed Birmingham Radar at the time who as would be expected saw nothing on the radar, probably due to the small size of the other ac.

**ATSI** had nothing to add.

UKAB Note (1): The pilot of the EC135 was very co-operative and provided additional information when contacted by the Secretariat. He is a very experienced helicopter pilot particularly in night operations. He was engaged on a routine police surveillance task, accompanied by 2 fully trained police observers, one visual in the left hand seat and one in the rear operating the ac equipment and, at the time, using NVGs. All 3 crewmembers saw 2 continuous (not flashing) blue/green lights and the front seat observer saw an object behind the lights. The rear seat observer saw the lights on his NVGs but nothing else due to 'blooming'. None of the crewmembers could offer any explanation as to the source of the lights other than that given by the pilot. The RT recording verifies that the EC135 pilot reported the incident to Radar and they responded by saying that there were no other contacts in the area.

The pilot discounted any 'flashing' from the rotor blades (as reported as taking place in some helicopter operations in the Middle East). He also stated that they thought that the source of the lights might be a reflection from the

NVG lenses onto the inside of the ac canopy; this was later discounted after another ac conducted a test on a later flight.

UKAB Note (2): All available radar recordings were examined and the EC135 shows throughout, squawking with Mode C, operating on the edge of the Birmingham CTR, both inside and outside Class D airspace. The RT recording shows that the pilot was in contact with Birmingham Radar and cleared to operate in the area. At the time the only other ac seen in the area and the only other in contact with radar, is a routine Birmingham CAT inbound which passes over the EC135, well above. (Although he did not report seeing it, the EC135 pilot was certain that the lights did not emanate from that ac). There were several 'one sweep only' primary contacts over 10nm to the W and slightly before the incident time that were attributed to anaprop [anomalous propagation].

UKAB Note (3): Due to the pilot's report the first organisation contacted by the UKAB in attempting to trace the source of the lights was the British Model Flying Association. Their view was that the object could not have been a model ac as it would have been too high and they had no reports of any activity at night. In addition it would not, in their view been possible to control a normal (in size and control system) model ac at that height since any light would not have been sufficient to enable control. In pursuing more sophisticated unmanned aerial vehicles, known civil, police and military operators of UAVs were contacted and no activity was reported (in any case it was a most unlikely location and time for the operation of UAVs, indeed virtually impossible for military UAV activity). Military flights were ruled out since there was no squawk observed and the area is outwith the UKLFS. Gliders, kites, tethered and untethered balloons were ruled out due to the light and weather conditions. There are no Met balloon launch sites in the area. All local GA airfields (except Halfpenny Green) reported no night activity on the date of the incident. The activity from Halfpenny Green was police operations that had landed before the incident time. Since the incident occurred in good radar coverage (both Birmingham and Clee Hill) and no contacts either squawking or primary-only were evident within 20nm of the incident position, it is thought most unlikely that the lights emanated from normal GA, other police or air ambulance activity. A laser light show was also discounted since there was no cloudbase for the lights to be reflected on. Fireworks or flares were also discounted since the light source did not descend towards the ground as, even with parachute flares, would be the case and, in any case, the lights reported were not bright enough to be pyrotechnics. The authorities for the parks close to the incident area were contacted but they had no activity recorded for the evening of 2 May.

Although the possibility of a civilian clandestine flight by a microlight or similar ac could not be ruled out, it is thought unlikely that any pilot engaged on illegal airborne activity would orbit what could probably be identified as a police helicopter.

Regrettably therefore, despite extensive tracing the source of the lights could not be identified.

## PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the helicopter pilot, a recording of the relevant RT frequency, radar video recordings and a report from the appropriate ATC authorities.

The Board noted the extensive tracing action taken by the Secretariat and accepted that any further effort was unlikely to determine the source of the lights reported by the EC135 pilot which, despite there being no information to support the crew's (unanimous) sighting, Members accepted totally as being accurate. The Board, which included a very experienced helicopter pilot Member with extensive experience of civil, military and police helicopter operations, was invited to offer an explanation as to the source of the lights: none was forthcoming. The possibility of a clandestine flight was only one of several possibilities and Members were not convinced that, other than by exclusion of other logical possibilities, there was sufficient information to mention this in the cause. Certainly however, the ac from which the lights emanated had been small and probably non-metallic since it was not displayed on either of the radars examined and had not been displaying the lighting required by the ANO. Members agreed unanimously that they did not have enough information to determine a degree of risk involved in the incident.

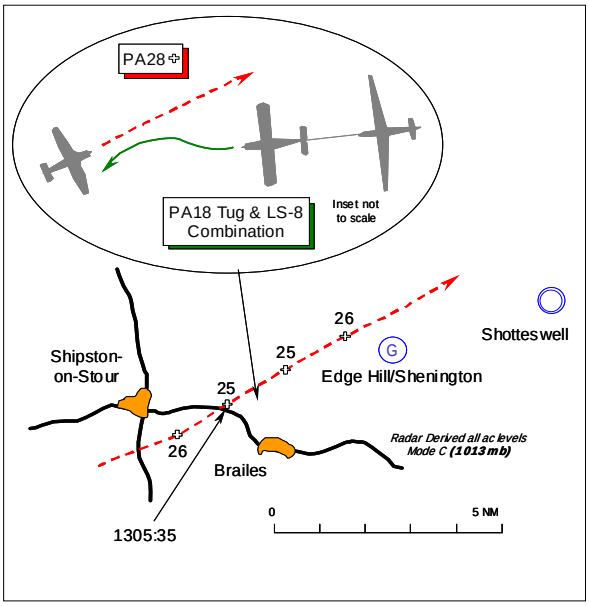
## PART C: ASSESSMENT OF CAUSE AND RISK

Cause: An apparent conflict with an unidentified ac displaying non-standard lights.

Degree of Risk: D.

## AIRPROX REPORT NO 056/08

| | | |
|---|---|---|
| *Date/Time:* | 2 May 1305 | |
| *Position:* | 5204N 00133W (Abeam Brailes ~ 3nm SW of Shenington GS) | |
| *Airspace:* | London FIR | (Class: G) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | PA18+LS8 | PA28 |
| *Operator:* | Civ Club | Civ Trg |
| *Alt/FL:* | 3400ft↑ amsl | 2500ft QNH (1016mb) |
| *Weather* | VMC CLBC | VMC CLBC |
| *Visibility:* | >10km | +10km |
| *Reported Separation:* | Nil V/300ft H | ~300ft V/200m H |
| *Recorded Separation:* | Not recorded | |




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

**THE PIPER PA18 TUG PILOT** reports she was conducting an aerotow launch from Edge Hill/Shenington Glider Site (GS), with an LS8 glider under tow on a 180ft rope, whilst in communication with Shenington Ground and the glider pilot on 129·975MHz. Abeam Brailes, heading westerly towards Shipston-on-Stour at 70mph, climbing slowly through 3400ft amsl in VMC some 500ft clear below cloud with an in-flight visibility of >10km, the glider pilot warned her on the RT of traffic. She turned right 10° to look for the other ac – which she had not seen – whereupon the LS8 Glider pilot said on the RT very sharply "turn left now" which she did. Immediately she saw the other ac – a low-wing single engine monoplane coloured white – crossing ahead into their 1 o'clock, she estimated about 1000ft away. It seemed the pilot of the other ac had not seen the Tug & Glider combination at all. The initial 10° R turn had put the Tug & Glider combination directly into the path of the other ac – the PA28 Arrow. When she made the sharp avoiding action L turn, the pilot of the PA28 reacted and turned L away from them, passing about 300ft to starboard at the closest point with a *"medium"* risk of a collision.

She added that the glider pilot had been planning what to do if they had collided! In the event the LS8 remained under tow and was released at 3600ft amsl, some 3000ft above Shenington GS. Neither Mode A nor Mode C SSR is fitted.

UKAB Note (1): Although sent a copy of the Airprox Form, the LS8 Glider pilot declined to provide a supplementary account of this encounter.

**THE PIPER PA28 ARROW PILOT,** a flying instructor, reports she was conducting a planned navigation exercise for a student who was the PF during a CPL skills test, operating VFR in VMC some 500ft below cloud with +10km in flight visibility. They were in receipt of a FIS from Brize ZONE on 124·275MHz and a squawk of A3716 was selected with Mode C.

Flying in a level cruise at 2500ft QNH (1016mb), on track, heading 070°(M) at 120kt, both pilots were keeping a good lookout and they were aware of the proximity of Shenington Glider site. The Tug & Glider combination was seen ahead, at or slightly above their altitude, and climbing. The sighting range was not quantified. To avoid the Tug & Glider, the PF reduced power to initiate a short descent but their course was maintained as the Tug & Glider combination was at a higher altitude – a turn to the R would have taken them towards the combination, whereas a turn to the L would have obscured the Tug & Glider behind their starboard wing. Passing 200m to starboard, the Tug & Glider combination was about 300ft above her ac at the closest point, still climbing, on an almost reciprocal heading. The risk was assessed as *"medium"*.

The ac is coloured white with blue & red stripes.

UKAB Note (2): The UK AIP at ENR 5-5-1-, promulgates that Edge Hill/Shenington Glider launching site is active during daylight hours for aerotows and winch launches that may attain a height of 2500ft agl, above the site elevation of 642ft amsl.

UKAB Note (3): This Airprox is not shown on radar recordings. The PA18 & LS8 Glider combination is not shown at all on the Clee Hill Radar recording which illustrates only the PA28 Arrow – identified from its assigned squawk of A3716 [allocated to Brize Radar] – on a steady ENE'ly course through the vicinity of the reported Airprox location. Indicating 2600ft (1013mb) – which would equate broadly to 2690ft on the Cotswold RPS of (1016mb) - the PA28 descends 100ft to an indicated 2500ft Mode C before ascending once more to 2600ft approaching a position about 1nm NW abeam Shenington.

## PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilot-in-command of both the Tug & Glider combination and the PA28, together with radar video recordings.

At an elevation of 642ft amsl, the avoidance of Edge Hill/Shenington Glider Site warrants careful consideration at the flight planning stage and it is clear that winch launching poses an added danger up to 3142ft amsl which also needs to be taken into account. Here the PA28 instructor pilot had reported that they were aware of the proximity of Shenington Glider Site to their route and they had evidently planned to fly clear to the NW of it, their projected track being some 2nm clear. To some Members this was a reasonable distance but others felt that giving winch launch sites as wide a berth as feasible was sound airmanship: a helicopter pilot Member familiar with this area opined that in this busy airspace he routinely affords 5nm clearance from this site.

Members were disappointed that the LS8 Glider pilot had declined to provide a supplementary account as his input would have added a valuable perspective on the encounter. Nevertheless, the PA18 Tug pilot's comprehensive narrative had laid bare the essential elements of this Airprox which was, in the Board's view, evidently a sighting issue. The gliding Member made it plain to the Board that when executing an aerotow, with the glider under tow, the Tug would have a pronounced nose-up attitude. Consequently, sighting ahead is hindered by the nose of the aeroplane and in the glider pilot Member's view this was a 'good spot' by the LS8 pilot who had astutely warned his PA18 Tug pilot. It seemed that the LS8 pilot's warning had come just in time and allowed the Tug pilot to turn away and sight the other ac, thereby affording about 300ft of horizontal separation at the closest point, the reporting pilot opined. This was about ½ of the distance reported by the PA28 pilot who elected not to alter course as the Tug & Glider combination was reported to be at a higher altitude as they passed abeam. The absence of primary radar contact on the Tug & Glider combination and that the former was not SSR fitted unfortunately prevented any independent assessment of the geometry that pertained here. Notwithstanding the 200m horizontal separation claimed by the PA28 pilot, the specialist gliding Member gave a salutary caution to other pilot's not to under fly a Tug & Glider combination because after the tow had been released the Tug will turn and dive away from the glider. Clearly, other pilots will not know when this is about to occur so under-flying a combination should be avoided at all costs – the lesson to be heeded here is to give the Tug & Glider as wide a berth as feasible. The Board concluded, therefore, that this Airprox was the result of late sightings by both pilots.

The LS8 pilot's astute warning had plainly enabled the PA18 pilot to take robust action and the latter's prompt reaction had ensured that the situation had not deteriorated further. The Board understood the PA28 pilot's reluctance to turn away for the very good reasons that she proffered. Nevertheless, 'the Rules of the Air' mandated that the PA28 give way to the Tug & Glider combination although 'the Rules' can only work if the other ac is seen in sufficient time to take appropriate action and the late sighting had unfortunately played its part here. Nevertheless, the PA28 pilots were not encumbered with a glider under tow and were always able to increase the separation and turn away if needs be. Similarly, the PA18 pilot elected to retain the glider under tow. All these factors convinced the Board as a whole that in the circumstances reported here, no risk of a collision had existed.

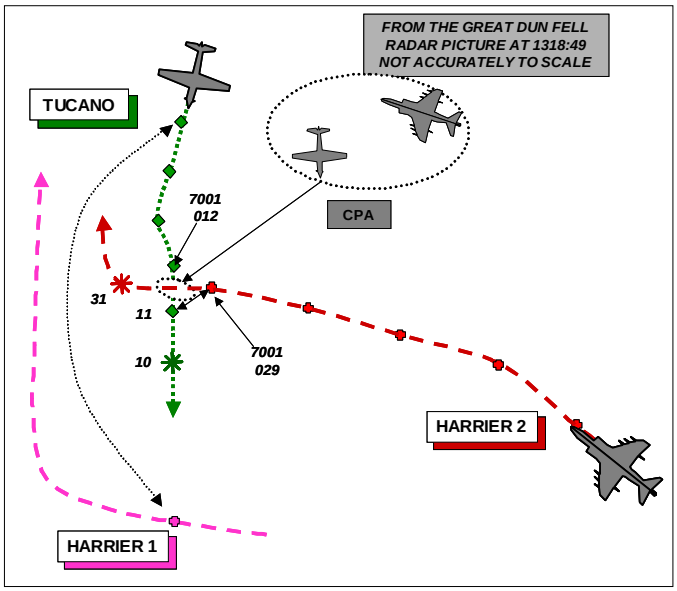
## PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Late sightings by both pilots.

Degree of Risk: C.

## AIRPROX REPORT NO 057/08

| | | |
|---|---|---|
| *Date/Time:* | 8 May 1319 | |
| *Position:* | 5424N 00221W | (13nm NE Kendal) |
| *Airspace:* | UKDLFS | (Class: G) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | Tucano TMk1 | Harrier GR9 |
| *Operator:* | HQ AIR (Trg) | HQ AIR (Ops) |
| *Alt/FL:* | 270ft AGL | 250ft AGL |
| | (RPS 1014mb) | (RPS 1010mb) |
| *Weather* | VMC Haze | VMC Haze |
| *Visibility:* | 8km | 6km |
| *Reported Separation:* | | |
| | 10-20ft V/ | 50ft V/300m H |
| | 100-150m H | |
| *Recorded Separation:* | | |
| | 1600ft V/ ½nm H | |




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

**THE TUCANO TMK1 PILOT** reports flying a singleton low level (LL) basic training sortie with a student pilot (SP) with the QFI teaching re-routing techniques. They had HISLs selected on and were squawking 7001 with Mode C, TCAS 1 was fitted and they were operating on the LL common frequency. After departing from Prestwick Airport, the ac entered LL at Loch Doon and flew S though LFA 16 to Carlisle at 240kt then on to Penrith through LFA17. The SP (in the front seat) was then tasked to re-route S to a new turn point (TP) of a road junction at the Western end of the Hawes/Leyburn Valley, by following a N/S Valley to the TP. About 6nm from the TP while heading 175°, a single TCAS contact appeared in their 1-2 o'clock at 1-1½nm which initially diverted both the QFI and the SP to concentrate more of their lookout in that area. [UKAB Note 1: At that time the Great Dun Fell radar picture shows that there was a single contact, albeit showing only for 1 radar sweep, in the Tucano's 12 o'clock at 3nm. It is presumed from projecting its subsequent track that this return was from the Harrier Leader]. That contact remained unsighted but about 5sec later both crew members saw a Harrier in their 11 o'clock, at about 300m heading towards them. The Harrier [UKAB Note 2: from the Great Dun Fell radar, Harrier 2] had a flight vector taking it just down the left hand side of their ac but at the closing speed at which the event took place neither the student nor the QFI had time to initiate any avoiding action. No TCAS contact was present that corresponded to the track of the Harrier [Harrier 2] at any time before, during or after the event and he assessed the risk of collision as being high.

**THE HARRIER GR9 PILOT** reports flying a grey ac on a high-workload, Low-Level OCU training sortie, with HISLs switched on, squawking 7001 with Mode C and operating on a tactical frequency. He was wingman of a pair that was being bounced in the Lake District and Northumbria by a single Hawk ac and they had descended to LL to the W of RAF Linton-on-Ouse about 5min before the incident. As they headed N towards Appleby, having crested over a ridge on the E side of the N/S orientated valley, heading 355° at 435kt, he initiated a shallow descent in order to maintain LL. Throughout this period he was scanning between his 7 o'clock and ahead in order to try and pick-up the bounce ac and as his eyes came into the 10 o'clock he picked up a single, black Tucano ac at close range slightly higher than his ac. It was too late and therefore pointless to initiate any avoiding action and he assessed, almost instantly, that there was no confliction that would affect the safety of either ac. It did, however, come as a shock to him that he had picked up the Tucano so late. He assessed the risk of collision as being medium and the remainder of the sortie was completed without further incident.

UKAB Note (3): The CPA occurred about 15nm S of the Great Dun Fell Radar head and the recording showed the incident and lead up to it throughout. The Tucano, squawking 7001 with Mode C (averaging 1100ft amsl QNH 1013; approx 250ft agl) can be seen tracking S down the Kirby Stephen valley. Meanwhile the Harrier approaches the N/S valley from the E, tracking about 290° on the right (northerly) side of a Battle formation, averaging 2800ft amsl (about 500ft agl) with his leader to the S flying over lower ground. As the Tucano passes through the Harrier

wingman's 12 o'clock, the latter commences a turn onto a NNW track. The CPA was at 1318:40 with the Tucano passing from right to left through the Harrier's 12 o'clock ½nm ahead (minimum) and about 1600ft below the Harrier with the former in the valley. The terrain immediately to the E of the incident position over which the Harrier (No2) had been flying rises to 2300ft at a point just over 1nm to the E and just before of the CPA. The valley floor above which the Tucano was flying is about 850ft amsl and rises slightly to the S. It is possible that there was some lag in the Mode C reading of Harrier 2 and that it had descended and climbed again, between radar sweeps (8 sec), which would not have been evident on the radar recording.

**HQ AIR TRG** comments that we low fly to avoid detection which can lead to late sightings of other low flying aircraft. TCAS provides extra SA, but it was not designed specifically for the low flying environment and it is well known by Tucano operators that the system cannot be relied upon to detect all other low flying aircraft. The Tucano crew were concentrating their lookout in the area of the TCAS contact which they never saw. However, they did see Harrier 2 but it was too late to initiate any avoiding action.

**HQ AIR OPS** comments that this was a late spot by the Harrier pilot who was concentrating his lookout towards his side of the battle formation. It is difficult to understand the geometry of this encounter given the radar information and the, seemingly conflicting, separations reported by the pilots. However, descending into the valley from above may have put the Tucano, dressed in black, difficult to see in shadow; the Tucano crew may not have been expecting to see a confliction coming down on them into the valley.

## PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members noted that this had been a routine, but close, encounter in the UKDLFS. The Tucano had been TCAS1 equipped but this had not highlighted the conflicting Harrier to the Tucano pilots, probably due to the low heights being flown by both ac and the mountainous terrain. Flying further to the S and slightly ahead, the Leader was, however, briefly displayed in the 1-2 o'clock on TCAS and this had caused both pilots in the Tucano to concentrate their lookout in that area when in fact the conflicting Harrier was coming from their 10 o'clock position and well above them. The conflicting Harrier was at or approaching a turning point and had been manoeuvring aggressively in the turn, trying to maintain/regain formation position and avoid the bounce ac. From Harrier 2 pilot's cockpit the dark coloured Tucano would have been in the valley and well below and most likely not visible to him until he crested the hill 2nm (about 15sec) to the E of the ac crossing point. The HQ Air Member pointed out that the purpose of low flying is to avoid detection; incidents such as this should not therefore come as a surprise. Bearing this in mind, Members considered that the pilots of both ac had seen the opposing ac almost as soon as they had been able to considering the surrounding terrain and closure speed. That being the case, the Board determined that the cause of this incident had been a conflict in the LFS which - since neither pilot had time to take any avoidance - was not resolved.

Neither the Board Members nor the Secretariat were able to offer an explanation as to why the Mode C data apparently showed a much greater vertical separation than that reported by the pilots. Both pilots reported however that there had only been 50ft or less vertical separation and, despite the unexplainable radar data, the Board accepted that the pilots' estimates were probably a more accurate indication of reality. Bearing in mind that the conflict was not resolved and that the separation was less than optimum, Members considered that, although the flightpaths were such that there was no actual risk of collision, normal safety standards had been compromised.

## PART C: ASSESSMENT OF CAUSE AND RISK

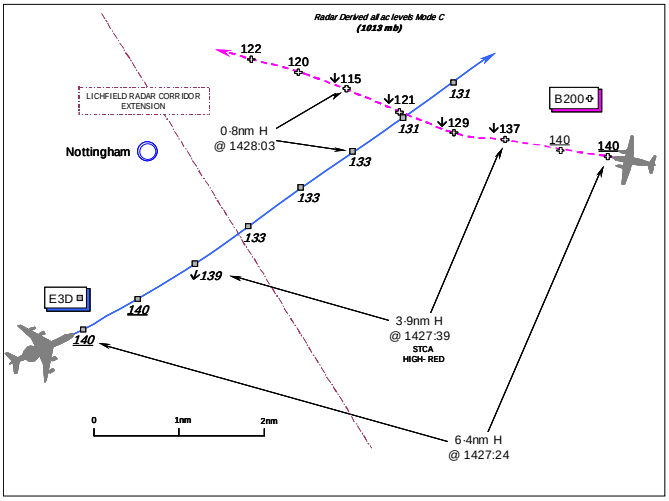
Cause: A conflict in the UKDLFS.

Degree of Risk: B.

## AIRPROX REPORT No 058/08

## AIRPROX REPORT NO 058/08

| | | |
|---|---|---|
| *Date/Time:* | 08 May 1428 | |
| *Position:* | 5256N 00101W (2½nm E by N of Nottingham) | |
| *Airspace:* | Lincolnshire AIAA | (Class: G |
| | *Reporting Ac* | *Reporting Ac* |
| *Type:* | King Air B200 | E-3D |
| *Operator:* | HQ AIR (Trg) | HQ AIR (Ops) |
| *Alt/FL:* | ↓FL120 | FL140 |
| *Weather* | VMC NR | VMC CAVOK |
| *Visibility:* | 40+ km | >10km |
| *Reported Separation:* | | |
| | 500ft V/2nm H | V nk/1nm H |
| *Recorded Separation:* | | |
| | Nil V @ 5·2nm H | 1800ft V @ 0·8nm Min H |




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

### BOTH PILOTS FILED

**THE BEECH B200 KING AIR PILOT,** a QFI, reports he was outbound from Cranwell on a training sortie; the ac was crewed with two pilots. A squawk of A5023 was selected with Mode C; TCAS and Mode S is fitted. They had been working Cranwell DEPARTURES (DEPS) on Channel 3 under a RIS and Manchester CONTROL under a FIS on 134·42MHz, whilst obtaining an Airways joining clearance.

Flying VFR in VMC with an in-flight visibility of 40km+, Manchester CONTROL passed traffic information to them about a conflicting ac of which DEPS had made no mention. Flying in a level cruise at FL140, Manchester was unable to accept them into CAS at this level and asked if FL120 was acceptable, to which they agreed. As they started to descend, heading 277° (M) at 265kt, TCAS enunciated a TA that was very quickly upgraded to an RA demanding a CLIMB. An E3D was acquired visually 5nm away converging in their 10 o'clock with all lights on "wings level – in a slight descent" - and as their B200 was already descending they increased their RoD to 6000ft/ min to get out of the E3D's way as they thought there appeared to be no reaction from the other ac's crew. The TCAS RA very quickly changed to a rapid DESCEND demand which was followed until it "cleared". Their descent was arrested at about FL117, whereupon they climbed slowly back to level off at FL120 by which time the E3D was astern and above them. The other ac passed 500ft above them and 2nm away at the closest point with a *"medium"* risk of a collision. He stressed that when this occurred they were already in a descent to FL120 as requested by Manchester CONTROL.

**THE E3D PILOT** reports his ac was crewed with 2 pilots a navigator and flight engineer. Following a flight trial flown on the W Coast of the UK, they were returning to Waddington under IFR via the Lichfield Radar Corridor (RC) level at FL140 in CAVOK weather. They were receiving a RCS from London Military in the RC, squawking A6444 with Mode C before later changing to A3612 at 1426. TCAS and Mode S is fitted.

London (Mil) initially reported conflicting traffic in their 12 o'clock at about 20nm which was observed on their TCAS display although not acquired visually at this stage. They had flown the RC with a 2nm offset to the N to avoid Langar Parachute Drop Zone which had been reported to be active, although London (Mil) advised that nothing was seen on their radar. As they prepared to leave the Lichfield RC, they noticed the previously mentioned conflict was now 5nm away on TCAS - still in their 12 o'clock - at FL140. At this point still under the "contract" of a RCS but waiting for it to be changed to a RIS when they exited CAS, they prompted London (Mil) and asked for a descent to FL130 because of the traffic ahead on their nose, but the response from the controller was to contact Waddington APPROACH (WADD APP) on Stud 3. In the time it took for the RH seat pilot to press the tuning button on the UHF radio, TCAS enunciated a DESCEND RA demanding a "max rate" descent between 4000-6000ft/min (at 1427 at a position 5257N 00058W). Heading E'ly at 280kt, the PF disconnected the autopilot and followed the

RA demand accurately whilst the flight engineer turned on all the ac's external lights. With the radio now tuned to WADD APP on Stud 3, the call "[C/S] TCAS descending" was transmitted on RT. Almost as soon as the ac had been set in the descent a CLIMB RA of 2000–4000ft/min was enunciated by TCAS, whereupon the ac was climbed rapidly in compliance with the demand. The CLIMB RA then moderated to 500ft/min before "CLEAR OF CONFLICT" was enunciated. During the whole event they only gained visual contact on the other ac – a small/ medium low-wing twin - as it passed below their port wing at an estimated range of 1nm in a steep descent. They finally recovered to level flight at FL130 and continued inbound to Waddington. He added that at the time of the initial DESCEND RA both ac were at the same level but after that he was unsure of the vertical separation.

**THE LATCC (MIL) LJAO CENTRAL CONTROLLER (CEN),** a unit Local Examining Officer, reports that he was examining another controller on the CENTRAL Sector when the Airprox occurred. Use of the Lichfield RC had been co-ordinated with MACC STAFA Sector for the E3D's crossing of CAS which was eastbound at FL140. Also on frequency was a Sentinel ac at FL430. The E3D crew's requested ATS on leaving the RC was established as a RIS prior to the ac leaving CAS. On leaving the corridor, conflicting traffic – the B200 - was called by the controller as "traffic right 1 o'clock, 8 miles, FL140 manoeuvring", which the E3D crew acknowledged. The traffic was actually about 11nm away from the E3D. Due to the ac having been pre-noted early to Waddington ATC the E3D was instructed to squawk the allocated squawk and a handover to Waddington ATC was completed. The ac was accepted by WADD APP and a contact frequency issued; at no point did WADD APP ask if the conflicting traffic had been called – at that point about 8nm of horizontal separation existed. Despite the E3D crew requesting a descent to FL85, the ac was transferred to Waddington maintaining FL140.

**THE WADDINGTON APPROACH CONTROLLER (WADD APP)** reports that the hand-over on the E3D was effected from LJAO 3nm W of Nottingham Tollerton Airport whilst inside the Lichfield RC at FL140. The E3D was identified to him and advised that the ATS would be a RIS on leaving CAS. Planning to enter the TACAN hold at FL85, during the handover no conflicting traffic was seen that would affect the E3D as it left CAS. As the E3D was released by LJAO 5nm later, the ac was in direct confliction with another track 8nm away on a reciprocal heading at FL140 – the B200. When the E3D crew called on Stud 3, the pilot had already begun manoeuvring in response to the TCAS RA which placed him in a rapid descent. Traffic information was immediately passed on the conflicting ac before the E3D was placed under the RIS as this was the priority at the time. The conflicting traffic had also initiated a rapid descent and was indicating slightly below the E3D so he continued to pass traffic information on the conflicting ac until the E3D crew called visual with it. Subsequently, the E3D crew was instructed to take up their own navigation for the TACAN hold and asked to report ready for descent.

It was discovered later that the B200 King Air had been in radio contact with Manchester CONTROL and had been given a clearance to join CAS at TRENT.

**THE WADDINGTON SUPERVISOR (WADD SUP)** reports that he only witnessed the end of the incident and could not recall exact details. Having just returned to his console and put on his headset, the WADD APP controller started calling conflicting traffic to the E3D crew as the ac left the Lichfield RC. Traffic information was called several times and the controller advised him that the E3D crew was responding to a TCAS RA by descending. The conflicting ac also appeared to be descending which struck him as unusual, minimum separation that he observed was about 1nm and 100-200ft, although he recalls that the Mode C of the B200 'dropped out' just before the CPA.

**THE MACC SE TACTICAL CONTROLLER (SE TAC)** reports that she was acting as OJTI to a trainee on the SE Radar position when the B200 crew called for an airways joining clearance. The fps was retrieved and the Trainee issued the squawk. When the CCDS converted the ac's SSR code to the callsign, the B200 was identified flying level at FL140, about 30nm E of TRENT, outside CAS and about 10nm away from another ac at FL140. The other ac – the E3D - had previously been co-ordinated through the Lichfield RC at FL140 but was now outside CAS and had just changed to a Waddington allocated squawk. Because of the short period of time between identifying the B200 and spotting the confliction with the other traffic at FL140, no ATS was stated and she advised her Trainee to pass traffic information. As the two radar returns got closer they suggested to the B200 crew to descend and then told the pilot to take a R turn if the other traffic was not sighted. The B200 crew reported visual contact with the E3D. Subsequently as the B200 started to descend so did the other traffic – the E3D – which they advised the B200 crew about. The B200 crew had the E3D in sight and advised they were descending faster. After the two tracks crossed the B200 crew was advised they were clear of the E3D and then given their CAS joining clearance as normal.

## AIRPROX REPORT No 058/08

**ATSI** reports that the MACC SE Sector TACTICAL position was being operated by a Mentor and Trainee. The B200 crew established communication with SE TAC, at 1426:40, requesting to join airways at TRENT at FL140, estimating TRENT at 1434. The flight's fps was taken from the pending bay and the crew issued with its allocated squawk - A5023. The pilot was asked if he could accept FL120 instead of the requested FL140. This was agreed. As soon as the allocated squawk converted to the flight's callsign on the controller's display, the trainee issued the B200 with traffic information at 1427:20, *"..traffic information..in your 10 o'clock at..the same level as you Flight Level 1-4-0 left to right..8 miles"*. The pilot replied *"Tally"* [that he had acquired the E3D visually]. The radar recording, timed at 1427:13, shows the subject ac, both at FL140, outside CAS, on conflicting tracks 8·4nm apart. The other ac was believed to be the E3D which had just cleared the Lichfield RC. This ac had previously been co-ordinated through the RC at FL140.

Because of the close proximity of the other traffic no agreement of ATC service was made with the B200 crew. However, in order to try and resolve the situation the trainee controller transmitted just before 1427:30, "[B200 C/S] *descend now*". No response was received from the pilot and the controller continued 10sec later "[B200 C/S] *if you can't see that traffic you can turn right*". The pilot reported "[C/S] *is..visual with him..we're avoiding..vertically".* He was informed that the other traffic was also descending. The pilot commented at 1427:50, *"Roger I think we're descending quicker than him"*. Shortly afterwards, once clear of the traffic, the B200 crew was cleared to join CAS at TRENT at FL120.

The radar recordings show that when the subject ac were 3·2nm apart, both had commenced descent, the B200 passing FL133 and the E3D FL135. The B200 did descend quicker than the E3D and by the time the two ac were about to pass 0·9nm apart the vertical separation was 1700ft. By this time the E3D had stopped its descent and had climbed to FL133.

The SE Tactical Controller spotted the confliction as soon as the B200's SSR code converted on the radar display to the ac's callsign. Traffic information was issued immediately, allowing visual contact. In the short time available, advice was offered on action to resolve the situation until the pilot confirmed he was visual with the E3D.

**MIL ACC** reports that the E3D was returning to Waddington via the Lichfield RC at FL140 under the control of LATCC (Mil). The BE200 crew had departed Cranwell for Leeds and was obtaining an airways joining clearance from Manchester ACC (MACC). The BE200 pilot reported that he was also in receipt of a radar service from Cranwell DEPS. However, Cranwell ATC has stated that the BE200 had left their frequency when the Airprox occurred. Therefore, Cranwell ATC did not submit any controller reports or tape transcripts.

The E3D crew was under a RCS with LATCC (Mil) LJAO CEN in the Lichfield RC requesting a RIS when clear of CAS. CEN had pre-noted the aircraft and the E3D was 2–3nm from the eastern boundary of the Lichfield RC when CEN instructed the pilot to squawk for Waddington. From the LATCC (Mil) radar recording the BE200 was bearing 080°-12½nm from the E3D and traffic information was given to the E3D crew. The E3D pilot reported that the other ac was displayed on TCAS but he was not visual. According to the E3D pilot's report, when the conflicting B200 was at 5nm on TCAS he requested a descent to FL130 to resolve the confliction. However, the LATCC Mil controller refused the request. There is no evidence explaining why the request was denied and the radar replay shows no conflicting traffic in the vicinity that would preclude the E3D from descending safely. No further traffic information was passed to the E3D crew by CEN. At 1426:30, the CEN controller commenced a handover of the E3D to WADD APP. The handover followed the standard procedure until WADD APP identified the E3D but no mention of the B200 was made by either APP or CEN before the handover was completed at 1426:52. The WADD APP controller's report stated that no traffic could be seen in the vicinity of the E3D at this time and that the ac's crew was released to call APP 5nm later. The E3D crew called WADD APP 45sec after the completion of the handover at 1427:37. The first transmission made by the E3D crew to WADD APP was *"Waddington* [E3D C/S] *TCAS descend."* To which APP replied "[E3D C/S] *Waddington Approach, traffic 12 o'clock, 5nm reciprocal heading indicating similar height also looks like its descending and identified RIS".*

Although traffic information was passed correctly in accordance with the conditions of a RIS in JSP552, the E3D crew was not updated as to the position of the B200 despite the continuing confliction. When the E3D crew requested a descent in order to resolve the conflict, the request was refused despite there being no obvious reason for the refusal. The pilot's requested course of action was not identified as an ideal solution to the confliction and the decision to refuse the request by the controller was not overridden by the Unit LEO. The presence of the B200 was not questioned at the handover by WADD APP and was not pointed out by CEN in accordance with standard

handover procedure despite the traffic having been called to the E3D crew. The radar replay shows a CPA of 2·6nm, 400ft.

UKAB Note (1) TCAS ANALYSIS


At UKAB's request NATS Ltd helpfully conducted a TCAS analysis of this occurrence utilising the ATM Safety Monitoring Tool (ASMT), which is a EUROCONTROL software tool used by the Operational Analysis department for the monitoring of TCAS events. The tool receives downlinked Mode-S messages and extracts the TCAS information. The tool is currently connected to the Pease Pottage Radar. The ASMT recorded information regarding this encounter and this data, along with the InCAS (Interactive Collision Avoidance Simulator) simulation, has been used as the basis of this assessment.

The simulation indicates that at 1427:17 both ac received TCAS TAs whilst in level flight at FL140. At the time of the alerts the aircraft were separated laterally by 7·2nm and on crossing headings. As the ac closed, the simulation suggests that the B200 began to descend reaching a rate of ~1500ft/min when it was issued with a "CLIMB" RA at 1427:33. The simulation suggests that the E3D was issued with a "DESCEND" RA 1sec later at 1427:34. The first RA downlink reports from both ac were received at 1427:36 which confirmed these alerts.

The radar data indicates that, rather than climbing in response to the RA, the B200 continued to increase its rate of descent while the E3D began to descend in response to the "DESCEND" RA. The simulation suggests that at 1427:36 the B200's rate of descent had reached 3500ft/min and the "CLIMB" RA changed sense to a "MAINTAIN VERTICAL SPEED" RA. The "DESCEND" RA onboard the E3D was also reversed to a "CLIMB NOW" RA at 1427:37. The next RA downlink at 1427:42 confirms the change to a reversal and maintain rate RAs. Radar data shows the B200 continued to increase its RoD reaching about 6700ft/min at 1427:43. The simulation suggests that at 1427:46, the "CLIMB NOW" RA on board the E3D weakened to an "ADJUST VERTICAL SPEED" RA instructing the pilot that the ac should not descend. The next RA downlink at 1427:48 confirms this 'weakening' of the RA.

The simulation suggests that at 1427:57 the "MAINTAIN VERTICAL SPEED" RA on board the B200 also 'weakened' to an "ADJUST VERTICAL SPEED" RA instructing the B200 pilot that the ac should not climb. The RA downlink indicates that this was received by the 1427:54 radar cycle, indicating that this 'weakening' of the RA actually occurred slightly earlier than in the simulation.

Simulation suggests that the ac crossed laterally and were issued with "CLEAR OF CONFLICT" at 1428:06.

UKAB NOTE (2): The Claxby Radar recording, which was not that used for the preceding TCAS analysis, illustrates this Airprox clearly. The B200 is shown approaching the Airprox location level at FL140 as the E3D is shown outside CAS within the Class G eastern extension of the Lichfield RC also maintaining FL140. Simultaneously with STCA alerting at high severity, the B200 is shown descending through FL137, at a range of

3·9nm from the E3D, itself shown descending through FL139. As the ac close upon each other, just before the B200 crosses the E3D's track, the twin turboprop turns R 20° and is shown descending through FL129, already 400ft below the E3D now indicating FL133. The E3D indicates this level for three sweeps as the B200 crosses ahead from R – L at a range of 1½nm descending through FL121 – some 1200ft below the E3D. The point of minimum horizontal separation occurred at 1428:03, as the B200 descended through FL115 and clears into the E3D's 10 o'clock at range of 0·8nm some 1800ft below the latter at FL133.

**HQ AIR (TRG)** comments that although this Airprox occurred in Class G airspace (see and avoid) both ac were receiving an ATC service. The pilot of the King Air should have followed the RAF teaching of 'normal' responses to TCAS indications. In not following the TCAS RA the King Air pilot negated the benefit of TCAS and made the E3D's avoiding action more difficult.

**HQ AIR (OPS)** comments that it appears that the E3D crew were handed to Waddington in confliction with the King Air. Having received the TCAS RA they followed it to the best of their ability, unaware that the other ac was not reciprocating.

## PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It was clear to the Board that this complex encounter just outside the eastern extremity of the Lichfield RC had several interesting facets. Whereas the CPA between these two ac occurred outside CAS in the Class G airspace of the Lincolnshire AIAA, the confliction had been evident to the LJAO CEN controllers and pointed out to the E3D crew through traffic information just before they exited the confines of the Class A RC. Conflicts at, or in the vicinity of, an airspace boundary and hence where a change of rules and responsibilities occurs can create significant challenges for the unwary and it was apparent to the Members from the Mil ACC report that the E3D crew were not best served here by LJAO CEN. From the E3D pilot's account, the crew had been forewarned through traffic information from CEN of the B200 cruising at their level of FL140 whilst they were within the RC in receipt of a RCS. The absence of a LATCC (Mil) RT transcript from CEN precluded accurate assessment of the timing - and thus ac position - when this call was made. Although the E3D crew thought this was from a range of 20nm, it seemed the B200 was first reported by LJAO CEN to be 8nm away. However, the LEO reports that the traffic was actually a little further away at 11nm distant whereas the Mil ACC Report suggests it occurred when the two ac were 12½nm apart. Having established that the conflict would occur outside CAS, where the E3D crew had requested a RIS to be provided, the overall responsibility for the separation of the E3D against the 'unknown' B200 would therefore transfer from LJAO CEN to the E3D crew subsequent to the passage of traffic information. The E3D pilot's comprehensive report shows that they had also identified the traffic on TCAS from 5nm away and the TCAS report makes it plain that a TA was enunciated from a range of 7·2nm at 1427:17. The Board agreed that with no indication of any other conflictions either inside or outside CAS in the vicinity of the RC the pilot's requested descent to FL130 to resolve the conflict at that stage would have been reasonable. Area controller Members mentioned that even inside the confines of the Class A RC, CEN might deviate from the co-ordinated level and elect to take horizontal separation themselves against other traffic. Certainly once the E3D had exited the eastern boundary of the Lichfield RC there was no reason that CEN should have refused the crew's requested descent - indeed under the RIS that pertained here in Class G airspace Mil ACC had shown that CEN had no reason to do so. Meanwhile, as the two ac flew into close quarters, CEN effected the hand-over to WADD APP. This process commenced, quite reasonably, whilst the ac was still just inside Class A airspace but CEN omitted to point out to WADD APP firstly that the confliction existed and secondly that the B200 had been called to the E3D crew. MIL ACC had highlighted a salutary point here, that CEN had not proffered this information during the handover, even though they were aware of the conflict, which controller Members agreed was completely at odds with prescribed procedures.

Thereafter, once clear of CAS, the E3D crew - whilst their ac was still in confliction - was instructed to switch to WADD APP without any further update on the traffic and, at that point, without visual contact on the smaller B200 from the E3D's flight deck. Controller Members were dismayed that the LJAO LEO had allowed this to occur and the LATCC (Mil) controller Member stressed that this was not in accord with Unit 'best practise'. CEN had not proffered any advice to forestall a close quarters situation and outside CAS the E3D crew quite reasonably could have descended of their own volition – as TCAS subsequently required them to do. Whilst recognising entirely

the inherent responsibilities under the RIS here, Members agreed with the Mil ACC perspective that CEN could and should have done more to resolve the developing close quarters situation. Members were of the view that the LEO should have stepped in and ensured that either the E3D crew was placed in an 'avoiding action' descent – as there was no indication at all at that stage that the B200 would itself descend - or alternatively a turn could have been suggested to take the E3D astern of the B200. Consequently, without any further corrective action proffered by CEN, the E3D was merely switched to WADD APP and the crew left to resolve the situation themselves. The Board agreed unanimously that part of the cause of this Airprox was that the E3D was allowed to fly into confliction with the B200, because CEN refused to allow the E3D crew to initiate their descent.

Military controller Members familiar with this airspace were surprised that Cranwell DEPS had not been more involved here from the outset. The B200's departure from Cranwell was not an unusual track and it was commonplace for crews to obtain their own airways joining clearance whilst in receipt of a RIS in Class G airspace, where perhaps terminal ATSUs in the vicinity might have better radar coverage at medium to low level and might be better placed to provide a radar service. Indeed, the B200 was still displaying a Cranwell squawk until just before 1427:11.

The Waddington RT transcript had made it clear that as soon as the E3D crew had contacted WADD APP they were already complying with the demanded DESCEND RA and correctly reported their response to the TCAS command, which the TCAS analysis had revealed had been enunciated and complied with at about 1427:34. For his part the WADD APP controller had not identified the confliction at the hand-over stage and remained unaware of the developing situation until the E3D crew had switched from LJAO; called and reported their TCAS DESCEND RA. But it was plain that even if LJAO CEN had advised WADD APP that they had called traffic information about the B200 to the E3D crew under the RIS, then WADD APP would still have accepted the hand-over and the situation would not have altered significantly. Thus the ac's crew would still have been reacting to the TCAS RA during the transfer of communication & control to WADD APP. That the controller continued to pass accurate traffic information, adding crucially that the B200 was also descending, was about all WADD APP could do in the circumstances. This would probably have reinforced the E3D crew's own situational awareness, in addition to their own displayed TCAS contact on the B200, but it might also have been perplexing to the E3D pilots knowing that the other ac was also descending at that stage.

Although the B200 crew reported that they had been working Cranwell DEPARTURES (DEPS) under a RIS it seemed from the Mil ACC report that the Airprox had occurred after they had switched from DEPS to Manchester CONTROL where they were cruising level at FL140 with no formal ATS specified whilst obtaining their Airways joining clearance. It was indeed helpful that Manchester CONTROL had spotted the E3D and passed traffic information to the B200 pilots, thereby forewarning them about the conflicting traffic. It was evident that MACC had been aware of the transit traffic through the Lichfield RC following co-ordination with LJAO CEN for the RC activation, and possibly forearmed with this knowledge the conflict became immediately apparent to the mentor and his trainee once the B200 was identified on radar. SE TAC wisely passed traffic information to the BE200 crew straight away and following this call, the B200 crew reported visual contact with the E3D, looming large to port. However, the phraseology used by the military crew of *"tally"* was perhaps not entirely self-evident to the trainee civilian controller at the time, as it did not seem to register that the B200 crew had indeed acquired the AWACS ac visually. Military pilots should bear in mind that civilian controllers might not immediately understand the meaning of unfamiliar 'operational' phraseology. However, SE TAC had helpfully tried to resolve the situation when the trainee controller transmitted just before 1427:30, "[B200 C/S] *descend now"*, which was a matter of moments before the TCAS RA was triggered in the BE200 cockpit and probably the reason that no response was received from the pilot until the controller added 10sec later "*..if you can't see that traffic you can turn right"*. Whereupon the BE200 pilot repeated in plain language that he was "*..visual with him..we're avoiding..vertically".* This further advice from the controller was however followed, it seems, for the radar recording shows that the B200 turned 20° R at about 1427:47. By then, however, the B200 crew was just starting to outrun the E3D's descent that was now in accord with the co-ordinated TCAS RA indications. No mention was made by the B200 crew of any TCAS RA to SE TAC on RT, but it seemed clear to the Board that MACC had done all they could to assist until informed that the B200 crew were taking their own separation against the E3D in their own way by descending at a higher rate. Thus MACC were entirely unaware that the B200 crew had received a TCAS RA for if they had, they would surely not have offered any advice on avoidance – in conformity with accepted practise - that once a pilot declares that he is following TCAS guidance no control instruction may be proffered.

When the DESCEND RA was enunciated to the E3D crew, pilot Members believed they exhibited sound airmanship when they wisely switched on all the ac's lights. This ensured that the B200 crew had the best chance

of sighting the large AWACs ac and it was clear from the B200 pilot's report that when he saw the E3D this was after its crew had been alerted to the conflict and were reacting as commanded. It seemed plain to the Members that the B200 crew was keen to descend in response to SE TAC's query of entry into CAS (at TRENT - to the N of the Lichfield RC) at FL120, some 2000ft below their level and some might perceive that the trainee controller's advice of "..*descend now"* might have impacted on the pilot's decision not to comply with the B200's initial TCAS CLIMB RA enunciated 3 sec after the RT call was made and moments after the B200 had commenced a descent. This initiation of the decent by the B200 crew and the initial CLIMB RA all happened in a matter of seconds before, the TCAS analysis revealed, the B200's rate of descent had reached 3500ft/min when the upward 'sense' of the "CLIMB" RA changed to a "MAINTAIN VERTICAL SPEED" RA commanding the pilot to continue his descent. This continued downward direction of the B200, in contravention of the co-ordinated RA, then induced in the E3D's TCAS a co-ordinated CLIMB RA a moment later, thus the E3D crew was instructed to reverse into a CLIMB NOW situation - again a very short period after the initial DECEND RA was demanded of them. CAT pilot Members directly familiar with the operation of TCAS were in no doubt that the E3D pilots did all they could to respond promptly to the TCAS demanded resolution. Whilst it was evident that the E3D crew's DESCEND RA was brief, the co-ordinated reversal into the CLIMB, shortly after both acs' TCAS had detected that the BE200 crew was not complying with their initial RA demand, was also somewhat short lived before both RAs moderated. The Board recognised the difficulty of arresting the descent of the E3D and reversing the momentum of this large ac complete with its large rotor dome, from the initial DESCEND RA to that required by the subsequent CLIMB. It was evident from the TCAS simulation and analysis that the E3D crew had complied as best they could but from the recorded data available it was clear that the nub of this encounter was the BE200 crew's decision to disregard the initial CLIMB RA and continue their descent. Whilst some Members were of the view that the B200 pilot had little opportunity to react to the CLIMB and also that the E3D's response was somewhat unproductive, the 'trigger' to the RA reversal was the B200's continued descent in the face of the initial enunciated CLIMB RA which had been disregarded. This was of great concern: in the overwhelming view of the pilot Members this was the fundamental aspect to be learned from this encounter, which the Command had reinforced. Moreover, this non-compliance with the demanded RA made it doubly difficult for the E3D crew, who were unable to supplement their SA with a visual sighting until after the B200 had already crossed ahead under their port wing. The Command's view was that this was contrary to accepted practise and appropriate re-briefing action had been taken. The Board concluded, unanimously, that the other part of the cause was that the B200 crew did not comply with their initial TCAS CLIMB RA.

Here the crews involved had been very fortunate insofar as the B200 crew had spotted the E3D and in their relatively nimble B200 managed to outpace the E3D's descent. Flying IMC in cloud, it might have been entirely different, but even here in the reported CAVOK conditions, as with any other TCAS encounter, the B200 crew could not be certain that the RA that had been triggered was the result of a conflict with the ac that they could see, not some other ac lurking unseen. Experienced pilot Members pointed out this was always a risk in Class G airspace: pilots should be in no doubt of the folly of non-compliance with TCAS RAs and all that can ensue if they do not follow its commanded advice to resolve a conflict. Moreover, it should be borne in mind that TCAS will only inform pilots about other transponding traffic; will only generate complementary co-ordinated RAs with other TCAS fitted ac and non-SSR fitted ac will remain invisible. Although in a co-ordinated encounter TCAS is capable of adapting its commands quickly to circumstances where pilots have not complied with its solutions, nonetheless it can cause others great difficulty and potential danger. All the time the E3D crew was getting to grips with the RA reversal, unlike the B200 crew they did not have visual contact with the other ac until, the recorded data suggests, just before 'CLEAR OF CONFLICT' was enunciated. It was stressed that the whole event happened very quickly - from the initial RA in the B200 at 1427:33 to 'CLEAR OF CONFLICT' was about 33sec. Fortunately, in that time the B200 crew outpaced the larger AWACS ac from a range of 5·2nm, where both ac were at the same level, to 1200ft vertical separation as the twin crossed ahead of the E3D, to the CPA of 0·8nm where 1800ft of vertical separation was evident. Whilst in no way lessoning the seriousness of the incident, the Board concluded, unanimously, that no risk of a collision had existed in the circumstances conscientiously reported here.

## PART C: ASSESSMENT OF CAUSE AND RISK

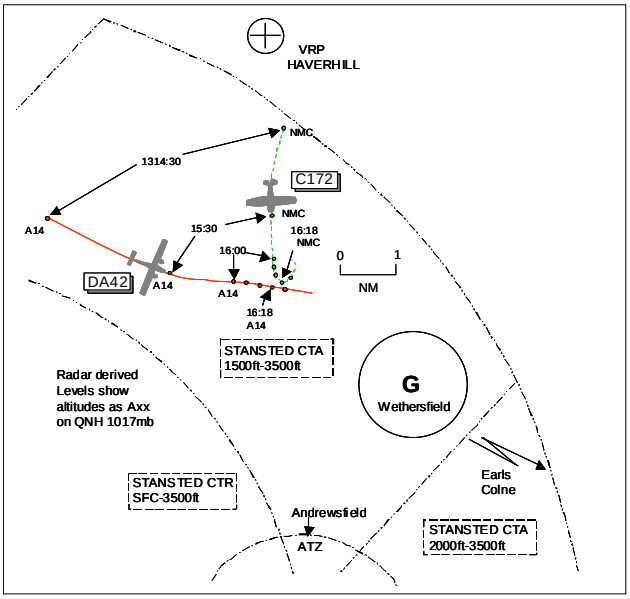
Cause: (i) The E3D was allowed to fly into confliction with the B200.

(ii) The B200 crew did not comply with their initial TCAS CLIMB RA.

Degree of Risk: C

# AIRPROX REPORT NO 059/08

| | | |
|---|---|---|
| *Date/Time:* | 10 May 1316 (Saturday) | |
| *Position:* | 5200N 00026E (10·5nm NE Stansted) | |
| *Airspace:* | LFIR | (Class: G) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | C172 | DA42 |
| *Operator:* | Civ Pte | Civ Pte |
| *Alt/FL:* | 1300ft | 1400ft |
| | (QNH 1016mb) | (QNH) |
| *Weather* | VMC CLOC | VMC CLOC |
| *Visibility:* | 40km | >10km |
| *Reported Separation:* | | |
| | 50ft V/400m H | Not seen |
| *Recorded Separation:* | | |
| | 0·2nm H | |




## PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

**THE C172 PILOT** reports inbound to Andrewsfield VFR from Hawarden with 2 other pilots onboard and in communication with Andrewsfield Radio on 130·55MHz squawking Mode A; Mode C was u/s. The visibility was 40km in VMC and the ac was coloured white/orange/black with strobe, nav and landing lights all switched on. Previously he had been receiving a FIS from Cambridge but approaching Haverhill he descended to 1300ft to transit under the Stansted CTA base 1500ft and then he switched to Andrewsfield for joining instructions. When NW abeam Wethersfield heading 174° at 100kt the P2 suddenly saw a twin-engined ac about 1300-1500m to starboard and 50ft above, a DA42 coloured white, which appeared to be coming straight out of Stansted Class D airspace and straight towards them. He, P1, identified the direction of the other ac and placed his ac into a steep descending turn to the L to avoid, losing 200-300ft very quickly. The pilot seated in the rear watched the DA42 overfly them separated by 400m horizontally appearing not to change track apparently without seeing them. The DA42's apparent exit from Stansted CAS had caught them off guard as normally conflicting traffic in the area are Wethersfield gliders or other traffic inbound/outbound from, and in communication with, Andrewsfield. He opined that they could have squawked 0013 (conspicuity code for ac outside Luton/Stansted CAS and monitoring Luton/ Essex Radar frequency) and listened out with Essex Radar. However with only 5nm to run it seemed more appropriate to listen out on the Andrewsfield frequency to cct and other joining/departing traffic prior to joining the cct in an orderly fashion.

**THE DA42 PILOT** reports being unaware of any Airprox as he did not see any conflicting traffic but provided brief details of his sortie. Flying solo enroute from Duxford to Redhill VFR he was in communication with Earls Colne Radio squawking with Modes C and S. The visibility was >10km in VMC and the ac was coloured white with a blue stripe; no lighting was mentioned. In the area cited where the incident occurred, he was heading E at 150kt and 1400ft QNH to stay under the Stansted CTA. He was maintaining a good lookout owing to the gliding site and can only assume the conflicting ac was lower than his and not visible owing to his starboard [actually port] wing and engine. When clear of the CTA he climbed to 2000ft to stay above Earls Colne aerodrome.

UKAB Note (1): The Debden radar recording clearly captures the Airprox. At 1314:30 a 7000 squawk, believed to be the DA42, is seen 5nm SW of Haverhill VRP tracking 115° indicating unverified altitude 1400ft (London QNH 1017mb) with another 7000 squawk, believed to be the C172, in its 1030 position range 4·5nm tracking 190° showing NMC. One minute later the C172 has steadied on a S'ly track towards Andrewsfield as the DA42 commences a L turn 2·1nm to its SW, rolling out 12sec later on 095°. Thereafter the 2 subject ac converge on a line of constant bearing. By 1316:00 the ac have closed to 0·8nm with the DA42 still showing altitude 1400ft in the C172's 2 o'clock. The CPA occurs 18sec later, at 1316:18, the C172 having just commenced a sharp L turn

passing through an ESE'ly heading with separation of 0·2nm. The next sweep shows the C172 turning through NE'ly heading, tracking away from the DA42 which has not deviated from its course indicating altitude 1400ft.

## PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

This Airprox occurred in Class G airspace where pilots are responsible for maintaining their own separation from other traffic through see and avoid. Both pilots were somewhat restricted in the vertical plane, owing to the Stansted CTA above, which led to both ac flying within a narrow 'letterbox' of airspace. Visibility was reported as good and both pilots were cognisant of the potential for conflict with gliding activity at Wethersfield. However the C172 pilot was caught out by the DA42's direction of approach from the Stansted CTR, perhaps having assumed that quadrant to be an area from where there was no potential threat. The GA Member opined that a full lookout scan should be carried out as a matter of course each time to capture potential threats from all directions. He also commented that the DA42 does have high-set engines which create blind-spots but these known restrictions to visibility should be alleviated – moving pilot's head, raising/lowering ac's wing - during visual scanning. Looking at the geometry of the encounter, the DA42 had right of way under the Rules of the Air Regulations as it was to the R of the C172 and on a crossing track. For just over 30sec before the CPA the subject ac were converging on a line of constant bearing, a situation where each of the conflicting ac would appear as a stationary object with no relative movement to be seen in either pilot's field of view. The opportunity for each pilot to see the other's ac was there for some considerable time prior to the Airprox but, for whatever reason, the DA42 pilot did not see the C172 whose pilot saw the DA42 late and this had caused the Airprox.

Fortunately the C172 pilot eventually saw the converging DA42 and, after quickly assimilating its flightpath, turned sharply L and descended to avoid a collision, estimating it passed above and 400m clear. The radar recording shows horizontal separation at the CPA as 0·2nm (370m). Although this encounter went unseen by the DA42 pilot, the robust actions taken by the C172 pilot were enough to persuade the Board that any risk of collision had been effectively removed.

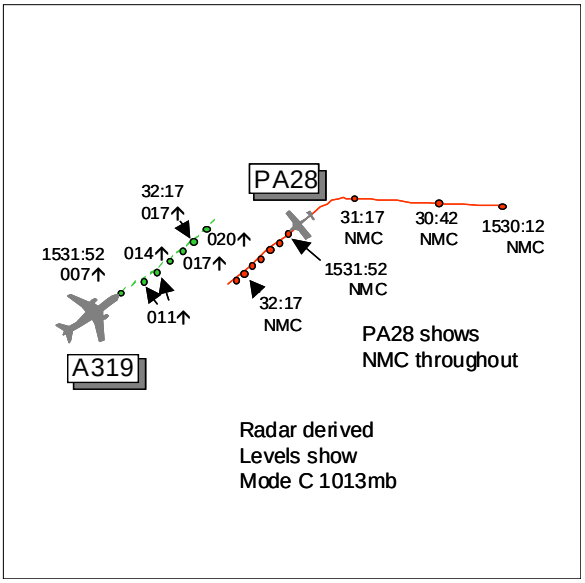
## PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A non-sighting by the DA42 pilot and a late sighting by the C172 pilot.

Degree of Risk: C.

# AIRPROX REPORT NO 060/08

| | | |
|---|---|---|
| *Date/Time:* | 16 May 1532 | |
| *Position:* | 5732N 00403W (O/H RW05 Inverness - elev 31ft) | |
| *Airspace:* | ATZ | (Class: G) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | A319 | PA28 |
| *Operator:* | CAT | Civ Pte |
| *Alt/FL:* | 1000ft↑ | 1000ft↓ |
| | (QNH 1011mb) | (QFE) |
| *Weather* | VMC CLBC | VMC HAZE |
| *Visibility:* | >30km | 6nm |
| *Reported Separation:* | | |
| | Nil V/<500m H | Nil V/800m H |
| *Recorded Separation:* | | |
| | c0·5nm | |




## PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

**THE A319 PILOT** reports outbound from Inverness IFR and under 'positive control' from Inverness Tower squawking with Modes C and S. Take-off had been delayed due to IFR traffic, he thought, and upon being cleared for take-off RW05, TI was passed on a light ac inbound 6NE of the airfield. Both pilots checked the take-off path, looking for traffic, prior to promptly rolling for departure. The traffic had not been visually identified and was not displayed on TCAS, he thought, but the departure lane was observed to be clear, the visibility being >30km. During a steep initial climb out heading 050° at 155kt climbing through 1000ft QNH, proximate traffic (white diamond) was observed on TCAS abeam their ac on the RHS with a range of <1nm; there was no associated Mode C. By now they were passing the RW05 threshold; both pilots were looking out and the 'intruder' was first identified by the FO as a PA28 on a reciprocal track at approximately 1000ft QNH with visual separation estimated to be 500m. He challenged the Tower controller on the incorrect position of the traffic as it was in the visual cct. Assessing the risk as medium, he expressed concern that the incoming traffic had passed an incorrect position to the Tower and then conducted a non-standard join off the Tower frequency whilst not squawking Mode C.

**THE PA28 PILOT** reports inbound to Inverness from Fife VFR and in communication with Inverness Tower on 118·4MHz squawking with Mode C off. The visibility was 6nm in haze and the ac was coloured red/white with anti-collision, strobes and nav lights all switched on. Heading 250° at 90kt about 2-3nm NE of Inverness descending through 1000ft QFE, he was visual with an A319 on the RW from the start of its take-off run until it passed 800m abeam climbing through his level. He opined that his ac would have been sky-lined to the A319 crew for a long time and would assume that they would have been visual with him as they had been made aware of his position. At no time was he told by ATC to take any avoiding action and he assessed the risk as low.

**THE INVERNESS ADC/APP** reports that prior to departure from RW05 the A319 flight was passed TI on an inbound PA28 which was passing Nairn (7nm NE of Inverness) at last known level of 1200ft VFR; the A319 crew reported TCAS contact at 5nm. The A319 flight was then informed that the inbound was working radar and that when the flight checked in it would be instructed to join downwind RH RW05. The PA28 pilot called and was instructed to join downwind RH RW05, given the QFE 1010mb and TI on the departing A319. The PA28 pilot reported visual with the A319 on the RW. The A319 departed at 1532 climbing straight ahead to FL60 (a restriction imposed by radar) and the crew reported that they were not happy with the proximity of the other ac. When the crew were asked if they wished to file an Airprox they declined. The flight was transferred to Radar at 1534 and subsequently the crew reported that they would be filing.

The Inverness METAR was EGPE 1520 05009KT 9999 FEW015 BKN026 12/09 Q1011=

## AIRPROX REPORT No 060/08

**ATSI** reports the incident took place at 1532UTC, ENE of Inverness Airport, close to the boundary of the ATZ, which extends to 2·5nm from the Airport. Inverness Airport is situated in Class G uncontrolled airspace. The Inverness weather at 1520UTC was reported as: 05009KT 9999 FEW015 BKN026 12/09 QNH 1011mb.

The A319 was an IFR departure to Gatwick, while the PA28 was inbound to Inverness under VFR from Glenrothes. The RW in use was RW05 and at the time of the incident, both flights were in receipt of an Aerodrome Control Service from the Inverness ADC.

The available radar recording provided only the ac targets and their associated SSR labels. No referencing data ie, video mapping, airspace or scale indications were present. As a consequence the RW C/L and measurements of distance had to be estimated from the limited information available. Mode C is displayed as a Flight Level, therefore an adjustment has to be made for altitude.

At 1525, the A319 pilot reported ready for departure at holding point Alpha 1, RW05. A few minutes earlier the flight had been issued with its departure clearance to Gatwick via the Advisory Route to the S, a discrete SSR code and an initial climb restriction of FL60. This had been readback correctly. The ADC advised the pilot that there would be a delay due to*"...traffic in the climb out path radar are waiting for it to clear..."*.

Meanwhile, at 1526:55, the PA28 flight was making its first call to Inverness Approach, reporting inbound at 1200ft on QNH 1010mb, 10nm E of Nairn (070°M/6·5NM from the Airport). Inverness APR was, at the time, being operated by a controller under instruction, accompanied by a mentor. Responding to the call, the controller advised the pilot that a FIS would be provided and issued the QNH 1011mb. The QNH was correctly readback. The only traffic on the radar recording that matches the PA28's movements is displaying the SSR code 7013, with NMC, and is tracking W in the vicinity of Nairn. 7013 is not an allocated code in the UK Code Assignment Plan and the controller under instruction at the time recalls noting it and intending to check with the pilot. However, higher priority tasks arose and the enquiry not made. It may have been simply an incorrect code, as later, when the ac was abeam the Airport and with no ATC intervention, the code changed to 7010, the Aerodrome Traffic Pattern Conspicuity Code, still with NMC.

About a minute later, at 1529:30, the PA28 flight was instructed to contact Inverness Tower. While this was taking place, the ADC was giving the A319 line-up instructions on RW05, via Alpha 1. This was followed by the issue of a local departure restriction and TI *"...after departure climb straight ahead to Flight Level six zero until advised by radar* (APR frequency) *be advised there is VFR traffic inbound to us seven miles north-east of the field it's a Piper Cherokee and last known at one thousand two hundred feet VFR he'll be joining downwind righthand".* The pilot replied (1530:12) *" Roger we have a return on TCAS about five miles northeast of the field* (A319 c/s) *and copy downwind righthand and lining up runway zero five".* The ADC reminded the pilot to climb straight ahead to FL60 after departure and at 1530:30, cleared the A319 flight for take-off, adding the surface wind at 060°/8kts.

Once the A319 pilot had read back his take-off clearance, the PA28 flight made its first call to Inverness Tower at 1530:42. The pilot reported E of Nairn at 1200ft on QNH 1010, requesting a rejoin. The progress of the ac on the radar recording would indicate that the ac was, at this point, more likely to be W or SW of Nairn. The pilot had already readback (to the APR) the current QNH, 1011mb. The Inverness ADC acknowledged the call and instructed the flight to *"…join and report downwind righthand runway zero five the wind 060° 9kts QFE 1010 traffic for you Airbus 319 departing runway zero five climbing on runway heading through your level to Flight Level 60".* The PA28 pilot readback the instruction to report downwind (but not the QFE) adding (1531:15) *"…I have the traffic in sight on the runway".* The radar recording shows that moments later the PA28 makes a L turn from W and establishes on a track parallel to, and S of, the departure C/L.

MATS Part 1, Section 1, Chapter 2, Page 4, Paragraph 6 ATZ, states *"Controllers are to provide an ATC service to aircraft within an ATZ and to aircraft under their jurisdiction in the vicinity of the aerodrome"*. At the time of the incident the subject aircraft were being provided an Aerodrome Control service. The MATS Part 1, Section 2, Chapter 1, Page 1, para 2.1 Aerodrome Control, Responsibilities, states: *"Aerodrome Control is responsible for issuing information and instructions to aircraft under its control to achieve a safe, orderly and expeditious flow of air traffic and to assist pilots in preventing collisions between: a) aircraft flying in, and in the vicinity of, the ATZ"*. It is considered that on this occasion the Inverness controller fulfilled his responsibilities by providing each subject ac with TI on the other.

By 1531:52, the A319 was airborne and passing FL007 Mode C (646ft QNH 1011mb) with the PA28 in its 1230 position at an estimated range of 2·5NM. They pass abeam each other between radar sweeps. The sweep before at 1532:17 shows the A319 passing FL017 Mode C (1646ft QNH) and the sweep after at, FL020 Mode C (1946ft QNH). Due to the limitations of the radar recording, the range between the two ac at CPA cannot be established with any degree of accuracy. However, it is estimated to have been in the region of 0·5nm. A short time later, the ADC provided the A319 with TI on another ac to the NE of the 'field'. The A319 pilot acknowledged the information and then said *"……we're reasonably close to that inbound traffic* (the PA28) *er he's not squawking Mode Charlie and it's of concern to us".* When asked at this point, the pilot elected not to file an Airprox. The flight was transferred to the APR who issued further vectoring and climb instructions, but several minutes later the A319 pilot returned to the subject of the PA28, stating *"……could you advise the tower that the GA traffic it would help enormously if they were to squawk Mode Charlie…I'm in two minds about whether to file an Airprox for the inbound traffic climbing under the climb out lane as we departed Inverness".* The APR agreed to pass on the message.

(Note: UK Aeronautical Information Circular (AIC) 15/2007 (Pink 112) 1st March, entitled COLLISION AVOIDANCE – IMPORTANCE OF SELECTION OF SSR MODE C, states in Paragraph 3 *"The purpose of this Circular is (therefore) to draw the attention of all pilots of transponder-equipped aircraft to UK SSR policy on this important safety related issue"*. The UK AIP (ENR 1.6.2 Paragraph 1.3 Sub-paragraph (d)) requires that where an ac is so equipped, *"Mode C should be selected simultaneously with Mode A unless otherwise instructed by an ATS Unit."*)

The MATS Part 1 guidance on the use of the Aerodrome Traffic Pattern Conspicuity Code (7010) is at Section 1, Chapter 5, Page 7, Paragraphs 4.7.2/3, *"The Code Assignment Plan includes the conspicuity code 7010, which may be allocated by ATSUs, or selected by a pilot as local procedure may require, when the aircraft is operating in or within approximately 2 miles of the aerodrome traffic pattern. The purpose of this code is to facilitate greater availability of the collision avoidance function provided by ACAS. It also allows a unit with appropriate equipment to filter or highlight the aircraft's position symbol as appropriate. Considerations for the use of A7010 specific to an individual unit shall be documented in MATS Part 2. A7000 and A7010, together with associated Mode C data must be considered unvalidated and unverified."* The Inverness MATS Part 2 refers to the use of 7010 in a Temporary Instruction Number 2/2007, which, in part, states *"…aircraft wishing to carry out circuit training at the end of a local sortie shall be instructed to change squawk to 7010, which shall also be displayed by all circuit-only traffic……"*. Therefore, in relation to this aspect, it is considered the Inverness controllers involved operated within the guidance provided by the MATS Part 1 and the Inverness MATS Part 2.

## 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 Director stated that much work has taken place to educate pilots about the importance of switching transponders on with Mode C and Members fully supported the AIC and AIP recommendations. In addition, much work has been undertaken by the Airspace and Safety Initiative (a joint CAA, NATS, AOA, GA and MoD effort to investigate and tackle the major safety risks in UK airspace) to educate pilots of the importance of squawking with Mode C and the implications of not doing so.

The A319 crew had been concerned about the proximity of the PA28 and Members agreed that this had stemmed from their perception of the situation which differed from that of the PA28 pilot. Whilst operating in Class G airspace there is a shared responsibility for crews to maintain their own separation from other ac through 'see and avoid'. ATC had fulfilled their responsibilities by giving TI to the PA28 pilot who saw the A319 on the RW and positioned his ac RH downwind taking 800m visual separation on the airliner. ATC had passed TI to the A319 crew on the approaching PA28 with its last known level and its intentions (it would be joining the cct RH downwind). The A319 crew reported on the RT that they had a TCAS contact on traffic 5nm away and had elected to depart without first obtaining visual contact with it. It was at this stage, when the crew were lined up for departure, that they had to decide whether or not to take-off, taking into account the TI given and traffic situation. Once airborne the crew were then surprised as the TCAS target became 'proximate traffic'. The PA28 was seen visually to pass about 500m down their RHS at a range closer than they liked or would normally expect when within CAS but which is quite normal when visual separation is taken by the VFR traffic within Class G. Pilot Members were concerned that the A319 crew was placing over-reliance on their TCAS equipment for separation/protection when this equipment is known to suffer from inaccuracies in azimuth at short ranges. Also, only transponding ac would be

displayed so caution should be exercised by all aircrew whilst operating outside CAS where non-squawking ac, which would not show on TCAS, may be flying through the area VFR not talking to any ATSU. Members opined that had the PA28 been squawking Mode C, the only difference here would have been confirmation to the A319 crew of the observed TCAS target's relative vertical separation on their display. The ACAS equipment had not generated any alerts/warnings, only showing the PA28 as proximate traffic. With Mode A NMC selected on the PA28, only a TCAS TA would have been generated had the equipment's 'safety bubble' parameters been breached. (An ac with NMC is assumed by TCAS to be co-alt but no RA guidance can be issued). Taking all of these factors into account the Board were minded to agree that this had been no more than a sighting report during which there had been no risk of collision.

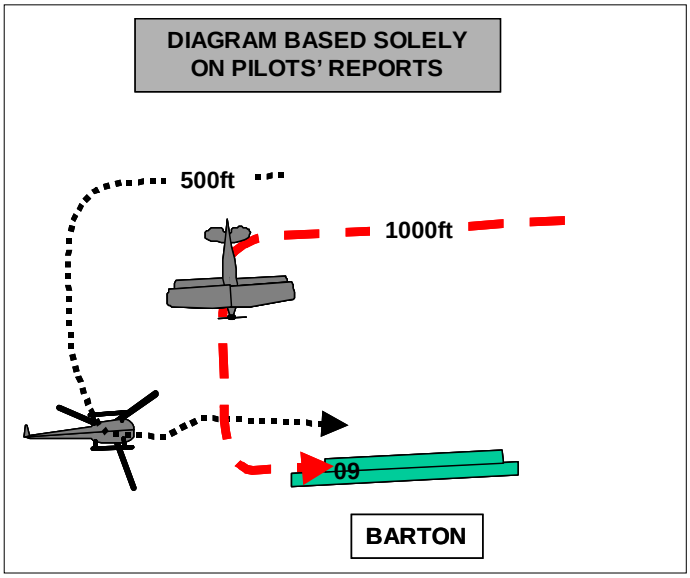
## PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Sighting report.

Degree of Risk: C.

# AIRPROX REPORT NO 061/08

| | | |
|---|---|---|
| *Date/Time:* | 15 May 1210 | |
| *Position:* | 5228N 00224W (Final Approach RW09 Barton Airfield - elev 73ft) | |
| *Airspace:* | Barton ATZ | (Class: G) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | Enstrom 280Fx | DH82 Tiger Moth |
| *Operator:* | Civ Trg | Civ Trg |
| *Alt/FL:* | ↓500ft (QFE) | ↓800ft (QFE) |
| *Weather* | VMC NR | VMC NIL |
| *Visibility:* | CAVOK | >5km |
| *Reported Separation:* | Nil V/150-200ft H | N/A V/800m H |
| *Recorded Separation:* | NR | |




## PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

**THE ENSTROM PILOT** reports flying a training flight in receipt of a FIS from Barton. He was squawking 7000 but Mode C was not fitted. After establishing on finals [to the Northside of the airfield], heading 090° at 55kt and after making a finals radio call, both his student and himself noticed a brown Tiger Moth ac in their 10 o'clock position on the downwind leg at about 600ft. While continuing their approach and at a height of about 400ft the Tiger Moth was seen to enter a descending left turn onto base leg and then cut directly in front of their helicopter. He immediately took control from the student and banked left to avoid the Tiger Moth. The student, who holds a fixed wing PPL, verified distance and heights in his report. This is the second occasion that this has happened to him by the same ac.

He assessed the risk as being high.

**THE TIGER MOTH PILOT** reports flying solo on a local flight from Barton in an ac fitted with a radio but no SSR. While in the Barton circuit and in communication with them he saw a helicopter on long final at about 500ft in the left hand circuit RW09. He was at the end of the downwind leg in the fairly tight 'Tiger Moth' circuit for RW09 and had commenced his descent on the base leg heading 180° at 60kt. Both pilots responded on seeing each other and changed their flight paths; the helicopter flew left and downwards and he levelled off. His altimeter was reading about 800ft but, as he was in a descent, there could have been some lag in the reading. Both pilots made RT calls.

He has recently started operating from Barton and was unaware that the rotary wing circuit for RW09 passed around the woodland to the NW of the threshold (he thought it likely that this track was selected to provide better opportunities for emergency auto rotations). His circuits were tighter than normal fixed wing circuits because of the poor glide (high drag) performance of the Tiger Moth.

Since this occurrence he has discussed the issue with ATC and Management at Barton and also with the helicopter operator. To avoid any further conflict he will now continue high (1000ft QFE) to the end of the wood to commence descent when clear of the railway line. He will also brief all the other instructors in his company to be aware of the confliction hazard when operating on RW09.

He considers this incident to be of low to medium risk as both pilots became aware of each other's ac at the same time and took appropriate action. He has taken steps to avoid any recurrence of the problem.

**THE TIGER MOTH OPERATOR** comments that their Operations Manual has been amended to include a specific warning about operations on RW09 at Manchester Barton.

## AIRPROX REPORT No 061/08

**ATSI** reports that the RTF recording shows that the Enstrom pilot reported rejoining from the NW at 1202. He was informed that the RW in use was 09 LH (cct) and the QFE was 1011mb. The Tiger Moth reported joining overhead and descending dead side at 1204. The pilot was asked to report downwind and advised that there were 2 in the circuit; he called turning downwind for 09R at 1205 and was advised of one ahead on final. Shortly afterwards, the Enstrom pilot reported *"final 14 numbers"*. At 1207 the Tiger Moth pilot reported on finals and contact rotary wing on inside. He added *"for your information my height was 900ft"*.

UKAB Note (1): An aerodrome Flight Information Service is provided at Barton.

UKAB Note (2): The circuit height for fixed wing ac is 1000ft, Barton QFE, and the height for helicopters is not above 500ft QFE.

UKAB Note (3): The Airport Duty Manager provided a full report. He stated therein *' The pilot* [Tiger Moth] *acknowledged that he was possibly not fully aware of the exact circuit pattern of the helicopters …'*. No exact circuit patterns, for either fixed wing ac or helicopters, are published in the UKAIP, Pooley's Flight Guide or in the Manchester Barton Pilot Handbook. Notwithstanding this, the Tiger Moth pilot agreed that he would fly a modified circuit pattern when the helicopter pattern is active.

### 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 Airfield Duty Manager and a report from the ATC authorities.

GA pilot Members observed that it is often difficult to integrate the circuits of different ac with disparate performance characteristics at airfields where no 'Control' service is available. In such circumstances pilots must be alert to other ac and the possibility that they are flying different patterns, possibly to different landing areas.

Equally, Members pointed out that at airfields where non-standard patterns are flown for whatever reason, it is important that these procedures are correctly published, not only locally but also in the UK AIP so that all pilots, whether locally based or from elsewhere, are aware of them. In this case even the locally produced pilots' handbook had not clearly described the circuit procedures.

Members found it difficult to determine from the pilots' reports precisely when they had seen each other's ac and where their ac had been at that time, concluding however that it had been after the Tiger Moth had started to descend on base leg when the Enstrom had been on long finals. It appeared to the Board that both pilots had seen the opposing ac at about the same time; they had both seen the potential for a conflict on short finals and had both taken action to resolve it as soon as they could. When he saw the Enstrom, the Tiger Moth pilot had correctly decided to go behind it in accordance with the Rules of the Air.

Nevertheless Members agreed that the pilots had both seen the other ac in reasonable time and therefore attributed the cause of the incident to be a conflict in the circuit. Since both reacted appropriately there had been no risk of a collision.

The Board commended the Tiger Moth operator for the action taken to try to prevent similar conflict in the future.

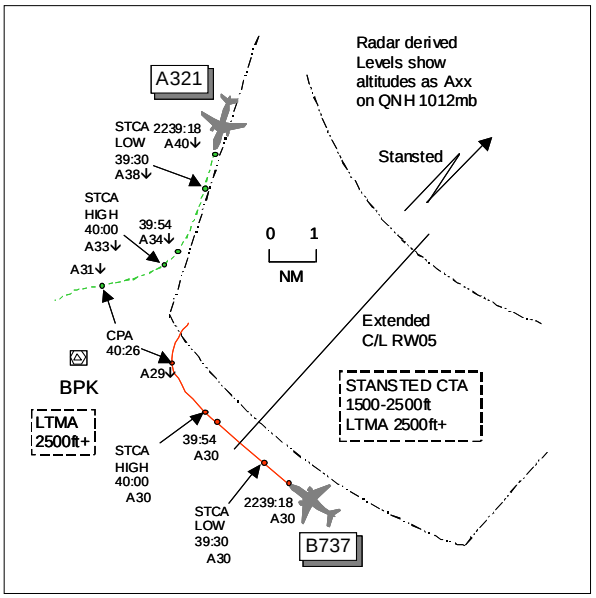
### PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in the Barton circuit resolved by both pilots.

Degree of Risk: C.

# AIRPROX REPORT NO 063/08

| | | |
|---|---|---|
| *Date/Time:* | 17 May 2240 (Saturday) NIGHT | |
| *Position:* | 5145N 00004W (14nm SW Stansted) | |
| *Airspace:* | LTMA | (Class: A) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | A321 | B737-800 |
| *Operator:* | CAT | CAT |
| *Alt/FL:* | 3000ft (QNH) | 3000ft (QNH) |
| *Weather* | VMC CLNC | VMC CLOC |
| *Visibility:* | 25km | 10km |
| *Reported Separation:* | Nil V/3nm H | 300ft V/3nm H |
| *Recorded Separation:* | 200ft V/2·3nm H | |




## PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

**THE A321 PILOT** reports inbound to Stansted IFR and in receipt of a RCS from Stansted Director on 126·95MHz squawking with Modes C and S. Being positioned downwind LH for RW05 heading 230° at 180kt and 3000ft QNH, Radar started to call another flight which did not respond. After 3 unanswered calls, Radar instructed them to turn R 60° followed 10sec later by a further 20° turn. By now they had seen the B737 in their 10 o'clock range 3-4nm away at the same level. At this point the B737 flight came on frequency and made a R turn to re-intercept the LLZ for RW05. He estimated that the B737 passed about 3nm clear to their L; no TCAS alerts or warnings were received. He believed that the B737 crew had taken another flight's call to transfer to Tower frequency before it had been vectored onto final. He assessed the risk as medium.

**THE B737 PILOT** reports that the following account was provided (two weeks after the Airprox, after a request was made by the company Flight Safety Office) in support of an ASR submitted immediately after the incident. They were flying inbound to Stansted IFR and were in receipt of a RCS from Stansted Director on 126·95MHz squawking with Modes C and S. For the approach to RW05 they were vectored RH downwind by Essex Radar before transfer to Stansted Director. Whilst on base leg heading 320° at 200kt and 3000ft QNH, they mistakenly took the call for another flight and, without considering the implications thoroughly, changed to Tower frequency. They then realised that heading 320° on base leg that they should not have switched frequency so informed the Tower that they were crossing the LLZ and would transfer back to Director frequency. Director called them and told the crew that he had called them twice previously before issuing a heading of 080° to intercept the LLZ from the L and descent to 2000ft. During the turn they saw other traffic in their 9-10 o'clock 4-5nm away 200-300ft above before it passed 3nm away on their L. Director then asked them to increase their ROD which they did and when level at 2000ft they established on the LLZ. During the turn onto 080° a TCAS TA was received but no RA was generated. He assessed the risk as low.

The pilot's ASR states that whilst on base leg approaching the LLZ they twice called the Director telling him that they were going through the LLZ. At that point they realised that they were talking on the Tower frequency which was on standby. They re-selected the Director's frequency, the controller stating that he had called their flight twice and then issued a heading of 080° to intercept the LLZ. They did not know the reason why the frequency switch occurred: either it was mistakenly switched or something else technical.

**THE STANSTED FIN DIR** reports vectoring a steady stream of inbounds to the ILS RW05. The B737 was on R base at 3000ft whilst the A321 was on an intermediate heading between downwind and L base also at 3000ft. He told the B737 flight to turn R onto a closing heading for the LLZ but received no response. He tried twice more, still expecting a reply. As a precaution he turned the A321 away to the R and then called the B737 flight again but

as there was still no reply he gave the A321 an 'avoiding action' turn. The B737 then came on frequency so he issued an immediate R turn with descent but as the flight appeared to be slow to turn he made the descent 'avoiding action'.

**ATSI** reports that the incident occurred at 2240UTC, approximately 14NM SW of Stansted Airport, in Class A CAS of the London TMA. Both flights were IFR and being vectored to an ILS approach RW05 at Stansted and in receipt of an APR service from the TC Stansted Final Director (FIN DIR).

Prior to FIN taking control of the flights, they had first received descent and vectoring instructions from the Stansted Intermediate Director (INT DIR), the A321 being positioned towards LH downwind, NW of the airport, and the B737 towards RH downwind, SE of the airport. The two flights were part of a steady stream of inbounds to Stansted.

At 2233:50, the B737 flight made its first call to the FIN DIR descending to 4000ft altitude and had been placed on a heading of 240° with instructions to reduce speed to 220kt. The FIN DIR instructed the flight to descend to 3000ft, advising it was 23 miles from touchdown. Two minutes later the flight was instructed to reduce speed to 180kt. The A321, meanwhile, was still with the INT DIR, descending to 3000ft and in a R turn to roll out heading 240°, downwind.

At 2237:39, the A321 flight contacted the FIN DIR and was advised it was 22 miles from touchdown on RW05. At this point in the sequence, the B737 was number 5 in traffic and the A321, number 6. At 2238:00, the B737 flight was instructed to turn R heading 320°, *'base-leg';* 30sec later, the A321 flight was issued a L turn onto 195° and a reduction in speed to 180kt. Stansted's proximity to other LTMA airports and their associated routes causes the airspace available to Stansted Directors to be restricted. One example is that traffic being vectored to Stansted's RW05 is required to be at or below 3000ft by the time it has reached the base leg position.

By 2239:15, the B737 was at the point when a turn towards the ILS LLZ was required. Another flight then made its first call on the frequency and the FIN DIR responded with *"Call you back break B737 c/s turn right heading zero four zero degrees and report established zero five"*. There was no response from the B737 crew and FIN DIR repeated the instruction. Once more, there was no reply, neither was there any indication of a change to the previously assigned heading (320°). By this time, 2239:30, the radar recording shows the B737 was at 3000ft, approaching the C/L at 90°, and converging with the A321 at a range of 6NM which was descending through 3800ft (for 3000ft). Alert to the developing conflict, the FIN DIR instructed the A321 flight to turn R heading 240° adding *"…break B737 c/s if you're with me turn right heading 070 degrees".* Again, there was no response from the B737 pilot and before the A321 crew could provide a readback, the FIN DIR transmitted again to this flight *" A321 c/s that's avoiding action I've lost one down to the south of you turn right heading 260 degrees",* which was readback. Finally, at the fourth attempt, the pilot of the B737 responded (2239:54) to a call from the FIN DIR with an apology. An immediate instruction to turn R onto heading 080° and descent clearance to 2000ft was issued. The controller followed this up with *" descend now please to two thousand feet that is avoiding action traffic just twelve in er crossing your twelve o'clock right to left is two miles away from you".* The radar recording shows that separation between the ac reached its minimum just after this transmission when, at 2240:26, they were 2·3nm apart, the B737 having just started a R turn and descent through 2900ft with the A321, at 3100ft, in its 10 o'clock position tracking W. No TCAS announcements were made on the frequency by either flight. Twenty seconds later, minimum required lateral separation (3NM) was restored, as the A321 passed astern of the B737 and their tracks continued to diverge. Further vectoring instructions were issued and both flights landed safely without further incident.

It was later established that the pilot of the B737 had not responded to the instruction being given by the FIN controller because he had changed, in error, to the Tower frequency. If the pilot had adopted the transfer instruction intended for another flight, there would appear to have been only two possible candidates. The first was a flight of the same company which was transferred to Tower at 2236:52. However, the RT recording shows the subject B737 correctly read back a clearance on the FIN DIR's frequency subsequent to that ac's transfer. The second was of a different company and with a significantly different callsign. Instrument Flight Rules in CAS (Classes A to E), include the requirement that the ac shall maintain continuous air-ground voice communication on the appropriate communication channel of, and establish two-way communication as necessary with, the appropriate air traffic control unit.

## PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members could not resolve why the B737 crew had changed frequency. On their (CA1094) Airprox Report Form, the crew stated that they took the call addressed to another flight and changed to Tower. Although perfectly feasible, Members wondered why the crew would have done this or not queried the frequency change as they were still flying on a base leg heading at 3000ft, prior to being established on the LLZ. Alternatively, the ASR completed immediately after the incident stated that the change could have been done in error or through a technical fault. An airline pilot Member explained that during normal flightdeck operations, the radio has an active frequency displayed in one window with the next frequency being pre-selected in the standby window. When instructed to change, or in this case perhaps in error, a transfer button is pushed and the displayed frequencies then change places, the standby frequency now becomes active and vice versa. Either of these reasons were valid but what actually happened was unclear. All that Members could agree was that the B737 did not comply with ATC instructions, owing to an incorrectly selected radio frequency, and flew into conflict with the A321 which had caused the Airprox.

The FIN DIR had reacted well when faced with this predicament. After twice being unable to establish any response from the B737 crew, he had turned the A321 R onto 240°. When no response was received to the next call, the FIN DIR had given the A321 a further 20° R turn as avoiding action and passed TI. The A321 crew saw the B737 whilst turning and watched it pass clear to their L and below. The B737 crew responded at the 4th attempt and were given a R turn to establish on the LLZ followed by avoiding action descent to 2000ft and TI. The B737 crew saw the A321 as they turned passing clear to their L and above. These timely actions and visual sightings allowed the Board to conclude that there had been no risk of collision during this encounter.

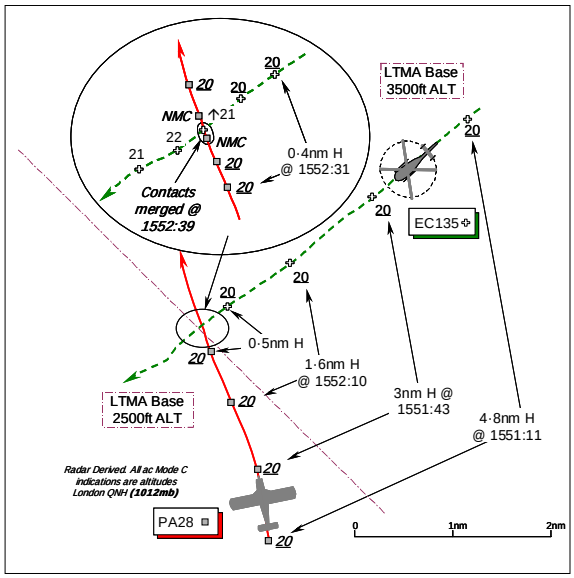
## PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The B737 crew did not comply with ATC instructions owing to an incorrectly selected radio frequency and flew into conflict with the A321.

Degree of Risk: C.

## AIRPROX REPORT NO 064/08

| | | |
|---|---|---|
| *Date/Time:* | 14 May 1552 | |
| *Position:* | 5137N 00017E (5nm ESE of Stapleford) | |
| *Airspace:* | London FIR | (Class: G) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | EC135 T2 | PA28 |
| *Operator:* | Civ Com | Civ Pte |
| *Alt/FL:* | 2000ft | 1800ft |
| | QNH (1012mb) | amsl |
| *Weather* | NK CAVOK | VMC Haze |
| *Visibility:* | 40km+ | 10nm |
| *Reported Separation:* | | |
| | 100ft V/30m H | 150ft V/250m H |
| *Recorded Separation:* | | |
| | Contacts merged/~100ft V | |




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

**THE EC135 T2 PILOT,** flying a bright yellow EMS helicopter, reports that he was in transit from Colchester to Queens Hospital Romford at an altitude of 2000ft London QNH (1012mb) under VFR in CAVOK conditions. Flying with a patient aboard, under Category 'Alpha' status, the patient was "spinally compromised" which required that the flight be flown as smoothly as possible.

Whilst in receipt of a FIS from Thames RADAR on 132·7MHz, approaching a position 110° LAM 5nm [W of Brentwood] heading 240° at 135kt, Thames Radar informed him of traffic in his 11o'clock - 5nm indicating 2000ft alt unverified Mode C. The controller informed him again when the range had closed to 2nm whereupon he became visual with a fixed wing ac – a PA28 low-wing monoplane coloured white with blue stripes - on a constant bearing in his 11 o'clock. He maintained his course and altitude until it became obvious that the PA28 pilot was not going to deviate and 'give way' to his helicopter. To avoid the PA28, he initiated a climb passing slightly ahead of (30m) and 100ft above the aeroplane whilst maintaining visual contact until it passed below him in readiness for further avoiding action should it be necessary. He could clearly see the two front seat occupants and reported the registration. He assessed the risk as "very high".

No TCAS is fitted and he added that it was single pilot lookout with both paramedics busy in the back. He subsequently passed a message to the PA28 pilot concerned that he was filing an Airprox.

**THE PA28 PILOT** reports he was in transit from Goodwood to N Weald under VFR. As Farnborough LARS East was not available, he was not under any form of ATS, just listening out on the N Weald RADIO A/G Stn frequency. A squawk of A7000 was selected with Mode C on.

Whilst in a level cruise at an altitude of 1800ft in VMC, heading 350°(M) at 110kt an Air Ambulance helicopter was spotted 250-300m away to starboard as it crossed very quickly from R to L some 250m ahead and about 150ft slightly above him. He had not seen the helicopter at all prior to this and it cleared to port in seconds. He assessed the risk as *"medium".*

Subsequently, he has given this incident considerable thought. He considers his personal lookout to be of a high standard and had never experienced an incident like this before. The front passenger seat occupant was a trainee NPPL (National PPL) and there was a rear seat passenger as well. Neither of them saw the helicopter before it passed in front of his aeroplane. This is rather ironic as part of the pre flight brief to his RHS passenger to help with his flying training was the importance of lookout. They had discussed this en-route and had picked up several other ac and gliders on this sector. Without knowing the previous track of the helicopter he could only conclude

that it was maintaining a constant bearing in the 'blind spot' caused by the door pillar/windscreen frame of his aeroplane and if it was slightly higher than himself the sun visor may have compounded the problem.

The other factor he has considered is that in the vicinity of the Airprox there were a large number of fields of bright yellow rapeseed. Given the bright but slightly hazy conditions, could the bright yellow and green of the helicopter colour scheme have acted as a camouflage? In his view, it is possible that this may have contributed not only to himself not seeing the helicopter – and he fully accepts that he was responsible for the lookout - but also his passengers on whose side it must have approached.

His ac has a white and blue colour scheme. HISLs are not fitted.

**THE LTC THAMES RADAR CONTROLLER** reports that he was operating with a trainee as an OJTI Mentor on Thames RADAR during the period of the Airprox.

The EC135 pilot called Thames RADAR en route from Colchester to the hospital at Romford at an altitude of 2000ft. Following identification, the EC135 pilot was given a FIS and the London QNH (1012mb).

At approx 1545, a squawk was noticed in the FIR on a converging track to the EC135 and at a similar level. The EC135 pilot was given traffic information on this contact. At about 1549, since the contacts were still converging at similar levels, the traffic information was updated using the clock code at a range of about 2nm. Following this second piece of traffic information, he believed the EC135 pilot reported visual with the unknown ac. Once the contacts had passed each other, the EC135 pilot informed them that he would be filing an Airprox report about the encounter.

**ATSI** reports with RT transcript that the EC135 pilot established communication with Thames RADAR at 1548. The pilot reported passing Chelmsford, routeing from Colchester to Romford at an altitude of 2000ft 1012mb. He requested a FIS, which was agreed. Approximately 2min later at 1551:10, the controller passed traffic information on a 7000 squawk *"look out for traffic northbound just coming into your 11 o'clock now at 2 thousand feet unverified"* – the PA28. The pilot reported looking and the range was added as *"about 5 miles"*. Traffic information was updated about 1 minute later just after 1552:10, *"traffic now just coming into your 12 o'clock 1 mile left to right 2 thousand 1 hundred feet unverified"*. The pilot reported visual at 1552:20 and, subsequently, that he had to take avoiding action and would be filing an Airprox.

The Thames Radar Controller fulfilled his responsibilities whilst providing a FIS. He issued appropriate traffic information which resulted in the EC135 pilot becoming visual with the unknown aeroplane.

The unknown aeroplane was subsequently identified as the subject PA28 inbound to North Weald from Goodwood. The PA28 pilot contacted North Weald RADIO at 1553, just after the Airprox had occurred, reporting just approaching Ongar at 1700ft ALT. No mention was made about the EC135 helicopter.

UKAB Note (1): Analysis of the Heathrow Radar recording shows the subject ac converging on broadly perpendicular tracks from a range of 4·8nm at 1551:11. The EC135 helicopter, identified from its individual squawk, is shown maintaining 2000ft London QNH (1012mb) as it approached the Airprox location on a steady SW'ly heading. The PA28, squawking A7000, tracked broadly NNW'ly also indicating 2000ft London QNH (1012mb) unverified Mode C - occasionally 2100ft – as both ac close to a range of 0·5nm. The diagram inset shows the latter stages of the close quarters encounter derived from the Stansted 10cm Radar source. The contacts merge at 1552:39 with no measurable horizontal separation, maintaining their respective headings; the EC135 crossed marginally ahead of the PA28 from the latter's starboard side and is shown at an altitude of 2100ft at this point (there may be an element of Mode C lag here but NMC is indicated by the PA28). The EC135 ascends to a maximum indicated altitude of 2200ft as the PA28, still with NMC displayed, draws aft, off the helicopter's starboard quarter. The next sweep shows the PA28 still at 2000ft and the EC135 descending back through 2100ft. Interpolation of the Mode C at the CPA suggests that vertical separation was in the order of 100ft as the helicopter overflew the PA28.

## PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

As this EC135 commonly operates in Glass G airspace, a helicopter pilot Member who routinely operates Air Ambulance services was concerned that it was not fitted with a form of collision warning system. TCAS I equipment is now commonly fitted to such ac and their effectiveness was emphasised. However, in the absence of such a device it was clear that the ATS provided here by Thames RADAR had been very helpful and Members commended the Thames RADAR control team for their comprehensive service to the EC135 pilot. It was plain that useful traffic information was promptly provided about the unknown PA28, initially from a range of about 5nm. The Board noted that this traffic information was updated one minute later when the range had closed to about 1nm, which had allowed the EC135 pilot to monitor that sector, acquire the light ac visually and report this to ATC. One Member suggested this might have been a late sighting but it was pointed out that in his account the helicopter pilot had reported that he acquired the small PA28 from a range of about 2nm, which was not unduly tardy.

Clearly the traffic information provided by ATC was perhaps over and above that normally to be expected under a FIS, but this illustrated 'best practice' and was clearly very helpful to the helicopter pilot. However, pilots should be aware that higher priority ATSs such as the provision of radar approach services to inbound traffic, or transiting flights that have requested a RIS/RAS, could understandably result in incomplete information or no warning being passed at all to those that had merely asked for a FIS. Whilst 'see & avoid' prevails in Class G airspace, pilots should always bear in mind that a FIS is the most basic of ATSs and generally under such a service little or no warning would be forthcoming from ATC about other flights.

Having visually acquired the PA28, the EC135 pilot reports that he elected to maintain his course and altitude until it became obvious that the PA28 pilot was not going to deviate and 'give way' to his helicopter, as was required in this situation under the 'Rules of the Air'. Members recognised that 'the Rules' can only work if the other pilot has spotted your ac in time to take appropriate action to remain clear. Evidently this was not the case here and it was left to the EC135 pilot to avoid the PA28 by climbing above and passing 30m ahead of the other ac, it was reported. Whilst this had just about resolved the conflict, another helicopter pilot Member was concerned that the EC135 pilot had not acted more promptly when it was apparent that the PA28 pilot was not taking action. Leaving avoiding action to this late stage was considered to be a contributory factor here. The EC135 pilot was plainly faced with a difficult dilemma and clearly Members did not know exactly to what extent the helicopter pilot could manoeuvre with his injured patient. Nonetheless, in a helicopter pilot Member's view it would have been feasible to give the PA28 a wider berth - either turning smoothly to the L to pass further astern or climbing above the aeroplane were feasible in this situation as the helicopter pilot was not unduly constrained by the base of the LTMA.

The nub of this Airprox was, however, that the PA28 pilot reports that he had not seen the helicopter at all until it was spotted 250-300m away to starboard as it crossed from R to L, very close ahead the radar recording reflected, and, he thought, 150ft above his aeroplane. Whilst noting that the RHS seat occupant had been carefully briefed to look out to starboard thereby sensibly supplementing the PA28 pilot's own lookout, it was clear that the PA28 pilot's own scan had been defeated by the small yellow helicopter closing – cross-cockpit on a constant relative bearing, with little crossing motion to draw attention to it – possibly against the background of a yellow oilseed rape field in the slight haze prevailing. Furthermore, the PA28 pilot would have been unaware of the urgency of the EC135's mission. The potential for obscuration was apparent to pilot Members. However, the GA Member was keen to point out that known blind spots must be taken into account within a disciplined scan regime and pilots must be prepared to move their head and/or ac around to clear ac blind spots regularly. Nonetheless, having spotted the helicopter at close quarters, pilot Members recognised that the PA28 pilot might have been unable to take effective avoiding action at this point. Therefore this was effectively a non-sighting by the PA28 pilot, which the Board concluded was the cause of this Airprox.

Turning to the inherent Risk, the helicopter pilot should not have been placed in this situation. But it was clear to Members that with only the EC135 pilot visual with the other ac from 2nm, he was inherently responsible for the separation that finally existed as the two ac passed each other. Pilot Members were surprised that having spotted the PA28 in reasonable time, the EC135 pilot had flown into close quarters before he climbed sharply to avoid the PA28 and having done so would have found it difficult to move out of the way if the PA28 had made a sudden unpredictable manoeuvre. Whilst he might have considered that the PA28 had been predictable up to this point, it might not have been a wise assumption that such would continue to be the case. Whilst acknowledging the nature of the helicopter's mission, Members believed that the EC135 pilot should have afforded a wider margin over the other ac, especially as the likelihood of losing sight of the aeroplane – again cross-cockpit, from the RHS - as it passed close beneath the helicopter was high. Here, the EC135 pilots chose the separation that finally pertained against the PA28. Whilst accepting that the nature of the patient's injuries might have necessitated

especial consideration, having elected to 'stand on' to route expeditiously on his urgent task and just climb 100ft or so above the light ac, it was the helicopter pilot's decision to pass this close to the PA28 which, in the overwhelming view of the Members, had compromised the safety of both ac.

## PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Effectively, a non-sighting by the PA28 pilot.

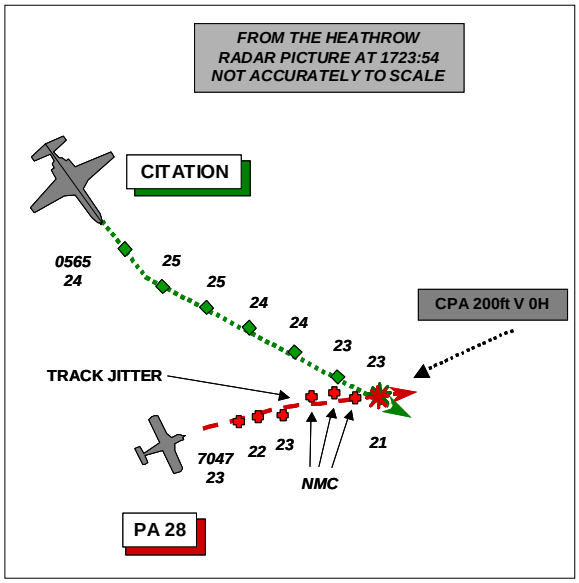
Degree of Risk: B.

Contributory Factors: Late avoiding action by the EC135 pilot.

## AIRPROX REPORT No 065/08

## AIRPROX REPORT NO 065/08

| | | |
|---|---|---|
| *Date/Time:* | 19 May 1724 | |
| *Position:* | 5121N 00007E elev 599ft) | (3nm NE Biggin Hill - |
| *Airspace:* | Biggin ATZ | (Class: G) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | C551 Citation | PA28-181 |
| *Operator:* | Civ Exec | Civ Club |
| *Alt/FL:* | ↑2400ft (QNH 1018mb) | 2300ft (QNH 1018mb) |
| *Weather* | VMC CLBC | VMC NR |
| *Visibility:* | 10km | 999km |
| *Reported Separation:* | 150ft V/0 H | 2-300ft V/100m H |
| *Recorded Separation:* | 200ft V/0H | |




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

**THE C551 CITATION PILOT** reports flying IFR from Biggin Hill to Le Bourget squawking as directed with Mode C. As they were cleared by ATC to line up on RW03, they were informed of traffic passing through the overhead at 2300ft tracking about 060°. They were cleared for take-off to follow a DVR2 SID with an initial climb clearance limit of 2400ft. Once they were established on the DET 277 radial at 2400ft, heading 100°, they heard an audio warning of traffic (TCAS was not fitted on the ac, only a traffic collision warning system) and the F/O observed the other ac as it passed 150ft beneath them. Simultaneously they were identified by Thames Radar and informed of the traffic which had approached from a relative bearing of 4 o'clock. He did not take any avoiding action, assessing the risk as being medium.

**THE PA28-181 PILOT** reports flying VFR from Fairoaks to Rochester in receipt of a FIS from Biggin Hill and squawking as directed with Mode C. They were heading 087° at 120kt, routeing from Ockham direct to Rochester via the Biggin Hill overhead and had been cleared to transit the ATZ via the Biggin overhead at 2300ft. While he was overhead, the Controller reported his position to jet traffic that was about to depart RW03 and the jet was also told not to turn until it had reached 1nm. He was then given TI on the jet traffic by the Controller so he confirmed his position as being overhead and that he was visual with the jet traffic. He saw the jet take off, climb, make a turn, and he watched it continuously as it came towards him, still climbing. It passed him about 100m ahead and 2–300ft above. He recalls thinking that they were close but did not report it as he was visual with the jet throughout and he could see that it was going to pass above him. He assessed the risk as being low.

**ATSI** reports that while the C551 was taxiing for departure from RW03 the pilot was given his departure clearance at 1713, *"after departure a right turn on a Dover Two departure climb to maintain altitude two thousand four hundred feet squawk Zero Five Six Five"*. This is a 'Standard Departure Route-via Airways' and the route is stated in the UK AIP 'Departures from RW03, after noise abatement, turn right to intercept DET VOR RDL 278° to DET'. The noise abatement for RW03 departures is 'Climb straight ahead to 1.0nm DME BIG then left or right as directed by ATC'.

The PA28 pilot established communication with Biggin (APP/TWR combined frequency) at 1715, the pilot requesting a FIS and *"zone transit at two thousand two hundred feet"* and was asked to standby. By now, the C551 was at the holding point and was informed that a radar release was awaited.

Just after 1716:40, the PA28 pilot passed his details *"Fairoaks to Rochester on a direct track one POB VFR request zone transit please at two thousand three hundred feet Flight Information Service"* [UKAB Note: It appears from the radar data that the pilot routed via the Biggin Hill Overhead rather than direct to Fairoaks]. A FIS was agreed and the ac was instructed to squawk the Biggin conspicuity SSR code 7047. The pilot reported his position abeam

Kenley at 5nm and was cleared *"you're clear to transit through the Biggin ATZ not below altitude two thousand three hundred feet report overhead the field"* and the clearance was read back correctly. The radar photograph, timed at 1716:46, shows a 7000 squawk (the PA28) approximately 7nm W of Biggin at 2300ft.

The C551 pilot was given a conditional line up clearance for RW03 at 1718 and 2min later he was informed, *"traffic to lookout for is a Cherokee transiting through the Biggin overhead he's just coming overhead now maintaining two thousand three hundred feet",* the pilot reported *"we have the traffic overhead in sight"* and was cleared for take off with a reminder about the noise abatement routeing. The radar recording timed at 1720:30, as the C551 was cleared for take off, shows the PA28 1.2nm W of the airport. The latter's pilot was then informed *"see you going through the overhead traffic to look out for is a Citation just departing RW Zero Three he'll be turning right at a mile and climbing to two thousand four hundred feet inbound to Detling"* and the pilot replied *"we'll keep looking for the Citation"* and was requested to report abeam Sevenoaks. The C551 was transferred to Thames Radar at 1722 and just afterwards, the controller informed the PA28 pilot *"that jet traffic appears to be in your left hand side probably about your nine o'clock and he's routeing to Detling"*. At the time the PA28 was 2nm E of the airport and the C551 was commencing its right turn to DET. The PA28 pilot reported visual and requested to change frequency to Rochester.

As soon as the C551 contacted Thames Radar at 1723:40, the controller asked, *"do you have the traffic just underneath you",* the pilot replied that he was looking and then, *"he's just gone through"*. The radar photograph timed at 1723:39, shows the subject ac on conflicting tracks, 0.6nm apart. The C551 is level at 2400ft and the PA28 at 2300ft; [2300ft and 2100ft on the Heathrow 23 cm Radar, 2300ft and NMC on the Gatwick] the radar returns then merge. The Airprox occurred 3.4nm ENE of Biggin Hill airport i.e. outside the ATZ (circle radius 2.5nm centred on RW 03/21).

The MATS Part 1, Section 2, Chapter 1, Page 1, states the responsibilities for Aerodrome Control, including: *'Aerodrome Control is responsible for issuing information and instructions to aircraft under its control to achieve a safe, orderly and expeditious flow of air traffic and to assist pilots in preventing collisions between ac flying in, and in the vicinity of, the ATZ'.*

The C551 was advised of the PA28 overhead, prior to take off and reported visual. (There were no other ac overhead at the time.) Early TI was issued to the pilot of the PA28 and was subsequently, updated, when he also reported the traffic in sight.

## PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board noted that the Citation was not fully TCAS equipped and that the incident had taken place about 5nm E of Biggin Hill in the relatively congested Class G airspace below the London TMA in an area where the base is 2500ft amsl. That being the case and despite that the Citation was IFR on a SID and the PA28 was transiting VFR, the 'see and avoid' principle pertained.

Members accepted that there were no ATC aspects to this incident other than to commend the Biggin Hill controller for the comprehensive and accurate TI given to both pilots. It was noted that the TI passed should have been more than adequate to allow both pilots to have a good knowledge of each other's position and intentions.

In the event the PA28 pilot had, sensibly in the view of GA Members, chosen to fly at 2300ft rather than the 2400ft (100ft below the base of CAS) frequently chosen by GA pilots. Further, he had passed his intentions clearly to Biggin Hill and obtained a timely clearance to fly through their ATZ from W to E. The TI passed to him regarding the Citation had enabled him to see it on the RW (03), take off and maintain visual contact as it turned towards him and pass just ahead and above him.

There was some discussion about the meaning of the term 'radar release' as passed to the Citation pilot. For the benefit of those accustomed to a different type of departure service, it was explained that this was simply that Thames Radar were content for the ac to get airborne with the intention of joining CAS. Thames Radar would not be providing any departure service whatsoever until the pilot called them and the ac was identified some minutes later. That being the case, despite that the Citation was departing IFR on a SID, the only obligation on ATC was

to provide TI on VFR traffic to enable/assist the pilot to see and avoid under the Rules of the Air. Members determined the Citation pilot had been given timely and accurate information regarding the PA28 which had enabled the crew to call visual with it before they took off. That they were not able to maintain visual contact was not surprising due to the respective ac tracks and the changed priorities of the Citation pilots during the take off run. What did surprise Members, however, was that when the Citation turned right onto the departure radial, the crew appeared to be unaware that their ac would then be in conflict with the PA28 and that since they were effectively the overtaking ac, they were obliged to avoid it. Members discussed how this could be achieved while maintaining the SID and agreed that it was not straightforward; they also agreed that although constrained vertically by the base of CAS, the Citation pilot could have given the PA28 a wider berth horizontally. Given the TI passed by Biggin Hill regarding the PA28's intentions, one Member suggested that a simple method of achieving separation would be for the Citation to remain on the ground for a couple of minutes allowing the PA 28 to pass through the departure path (SID). Although this would have to be agreed by ATC, the onus is on the pilot to request it rather than on ATC to deconflict the two ac.

There was extensive discussion regarding the cause with some Members arguing that it was a sighting issue and others that the Citation pilots had flown into conflict with the PA28. Members concluded, however, that in a very busy period when the Citation pilots were about to change agencies and join CAS and with much of the activity necessarily being conducted 'heads in', the Citation pilots, although aware of the PA28's intentions, had overlooked its presence and therefore had not registered it as being a significant threat.

Since the PA28 pilot had seen the Citation throughout and he decided that although close, no avoidance was required, the Board agreed that there had been no risk of a collision.

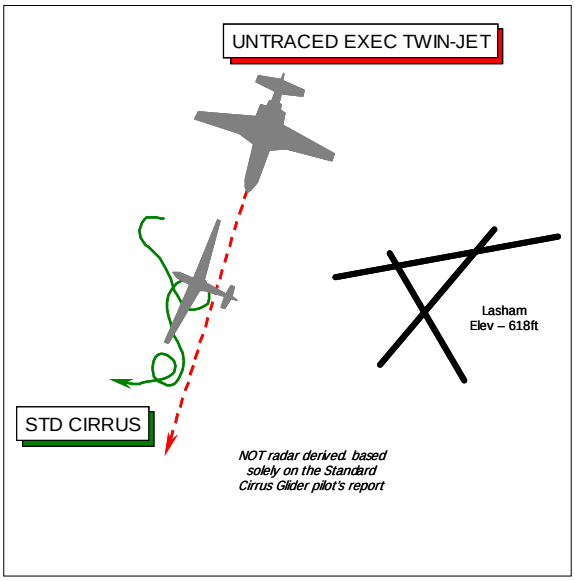
## PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Despite accurate TI, the C551 crew climbed into conflict with the PA28.

Degree of Risk: C.

## AIRPROX REPORT NO 067/08

| | | |
|---|---|---|
| *Date/Time:* | 21 May 1210 | |
| *Position:* | 5111N 00103W (1nm W of Lasham - elev 618ft) | |
| *Airspace:* | London FIR | (Class: G) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | Cirrus glider | Untraced twin-jet |
| *Operator:* | Civ Pte | N/K |
| *Alt/FL:* | 2100ft QFE (995mb) | N/K |
| *Weather* | VMC Haze | N/K |
| *Visibility:* | 10km | N/K |
| *Reported Separation:* | Nil V/100m H | NR |
| *Recorded Separation:* | Not recorded | |




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

**THE STANDARD 15m CIRRUS GLIDER PILOT** reports he was thermalling to the W of Lasham in VMC some 1500ft clear below cloud with an in-flight visibility of 10km. Just after commencing a thermal turn to the L at 2100ft Lasham QFE (995mb) at 50kt in a position about 1km to the W of Lasham an executive type twin-jet was sighted 1km away as it emerged from the haze. The other ac - possibly a cream coloured Citation [a five letter registration was quoted] - was heading SSW and approached his glider from the NNE flying straight and level at his height of some 2100ft agl. To avoid the other ac he widened his L turn and then turned and straightened to keep it in sight as it passed some 100m away with a *"high"* risk of a collision as the twin-jet continued to the SW.

A pictorial representation of his glider's track in the vicinity of Lasham taken from a data logger was helpfully provided. However, time was not shown.

UKAB Note (1): The RAC expended considerable effort whilst endeavouring to identify the ac reported by the Cirrus glider pilot. However, careful review of the radar recording's of the many sources available to the RAC at Swanwick did not reveal any contacts whatsoever that could be associated with the passage of a twin-jet close W abeam Lasham at the reported Airprox time of 1210UTC. Analysis of the recordings bracketing a period +/- 1 hour either side of the reported Airprox time again proved fruitless. Further consultation with the reporting pilot, both by RAC and UKAB staff, reaffirmed the glider pilot's conviction as to his estimate of the details of this Airprox. However, despite exhaustive and protracted investigative effort no ac could be located that coincided with the reported location, time and height. Consequently, the identity of the ac reported by the glider pilot remains unknown.

UKAB Note (2): The UK AIP at ENR 5-5-1-3, promulgates that Lasham aerodrome glider launching site is active during daylight hours for winch launches, which may attain a height of 3000ft above the site elevation of 618ft amsl, and aerotows.

### PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included a report solely from the glider pilot together with radar video recordings.

Extensive tracing action was undertaken here to identify the reported ac, ultimately proving fruitless. It was explained that it had not been possible to reconcile the reporting pilot's account of the incident he observed with that replicated by the radar recording. In this area of relatively solid radar coverage the specific glider flown by the reporting pilot could not be identified because of the large number of primary contacts from gliders at Lasham. Furthermore, the various Swanwick radar recordings did not show any ac contacts in the vicinity that could be

associated with either an executive jet or the slower propeller driven ac to which the registration given by the glider pilot referred. The latter ac, as identified by the glider pilot, was ruled out after the RAC had checked with its operator - thus attention had focused on locating another twin-jet.

The Board was briefed that the 5-letter registration provided by the reporting glider pilot for the twin-jet that he encountered at 1210UTC, 1km W of the threshold to Lasham RW09, contained letters extremely similar to another ac shown on the Heathrow radar recording at 1211:08 UTC. This ac was inbound to Farnborough and shown at a position 6½nm E of Lasham, before turning R about through N, to pass just over 4nm E of Lasham descending through 2500ft London QNH and then establishing on FINALS for RW06 at Farnborough. The ac was identified as a Learjet 45 with a foreign registration that included 4 of the 5 letters given in the Cirrus pilot's account but in a different alphabetical order. However, when the reporting glider pilot was asked whether he might have been mistaken about the location of the Airprox and that the encounter might feasibly have occurred some distance to the E of Lasham with this Learjet 45, he rejected this possibility and was steadfast in his view that the Airprox occurred 1km W of Lasham. Therefore, with only the glider pilot's report on which to base their assessment it was difficult for the Board to come to any positive conclusions.

The glider pilot Member commented that the provision of complete data from the glider's logger might obviate such difficulties in the future and he was keen to facilitate the provision of such data which would certainly assist in resolving anomalies of position track and potentially time. As it was, the Cirrus pilot had clearly spotted the unknown executive twin–jet - he believed it to be a Citation – as it approached his glider from the NNE, had widened his L turn to avoid it and then manoeuvred further to keep it in sight as it passed some 100m away. That he had seen it in sufficient time to take appropriate action had apparently forestalled a more difficult situation but at the distances reported here it seemed immediate action was necessary. However, with only one side of the story and no radar data to illustrate the encounter the Board could only conclude, perhaps rather unsatisfactorily, that this Airprox had resulted from a conflict with an unknown executive jet. Furthermore, without more complete information, the Board could not come to any meaningful conclusion as to the inherent Risk, thus unfortunately placing this Airprox in the 'Risk could not be determined' category.

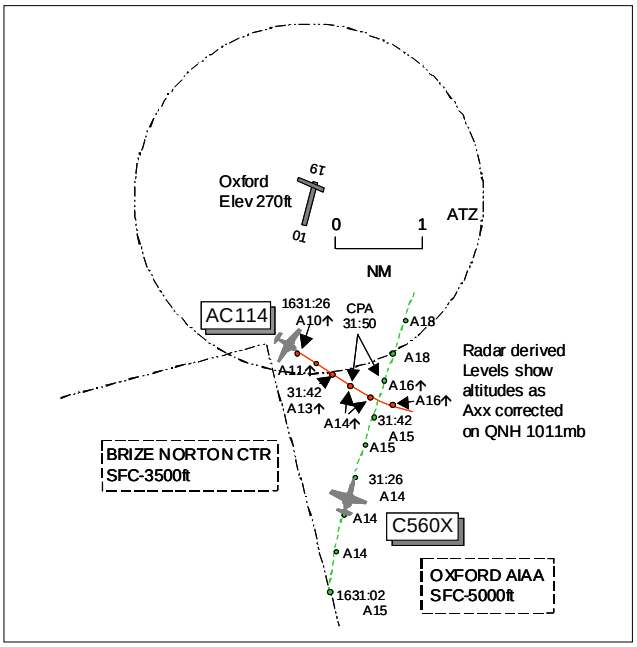
## PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict with an unknown executive jet.

Degree of Risk: D.

# AIRPROX REPORT NO 068/08

| | | |
|---|---|---|
| *Date/Time:* | 23 May 1632 | |
| *Position:* | 5148N 00118W (2·25nm SSE Oxford - elev 270ft) | |
| *Airspace:* | ATZ/Oxford AIAA | (Class: G) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | C560X Citation | AC114 |
| *Operator:* | Civ Pte | Civ Pte |
| *Alt/FL:* | 1500ft (QNH 1011mb) | 800ft↑ (QNH) |
| *Weather* | VMC CLOC | VMC CLBC |
| *Visibility:* | >10km | 6km |
| *Reported Separation:* | 200ft V/Nil H | 300ft V/0·5nm H |
| *Recorded Separation:* | 200ft V/0·4nm H | |




## PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

**THE C560X CITATION PILOT** reports inbound to Oxford VFR in receipt of a FIS from Oxford Tower, squawking with Modes C and S. The visibility was >10km in VMC and the ac was coloured white/gold with strobe and nav lights switched on. Whilst entering the visual cct downwind LH for RW19 heading 030° at 200kt and 1500ft QNH, a TCAS RA was received. The RA 'climb' command was followed to avoid the conflicting traffic which, according to his display, passed underneath by 200ft. ATC had told them about departing traffic from RW19 but they were never visual with it. He believed that there should be vertical separation between departing and arriving traffic, either a higher level for them until clear of the conflicting ac or a lower level assigned to the departing ac. He thought it odd that they were cleared by ATC for a visual approach when traffic was clearly going to cross their track immediately after departure. Following the TI given, he could have elected to cancel the visual approach and fly the full ILS procedure although this would have involved considerable manoeuvring at a late stage and may not have provided safe separation from VFR traffic anyway. He assessed the risk as very high.

**THE AC114 PILOT** reports outbound from Oxford VFR and in communication with Oxford Approach on 125·325MHz squawking with Mode C. The visibility was 6km below cloud in VMC and the ac was coloured white with strobe lights on. He was cleared by ATC (operating on a single frequency i.e. no Tower frequency) for a VFR departure from RW19 with a L turnout direct to Wycombe Air Park and he copied TI on traffic joining from the S. On climb-out he was warned by ATC of jet traffic joining downwind. At 500ft he completed his LH climbing turn onto heading 100° at 100kt and at 800ft, he thought, he saw the downwind traffic, possibly an HS125, in his 1 o'clock in level flight slightly above and moving rapidly L. He passed 300ft below and 0·5nm behind it before he heard the HS125 pilot report a TCAS alert and thought 'that'll be me then'. After a further 2-3min he signed off with Oxford and changed to Wycombe. He was aware of the traffic before taking-off and saw it when and where he expected to, opining that at no time was there the slightest chance of a collision.

**THE OXFORD ADC/APP** reports the C560X flight was inbound from the S and opted for a visual downwind join for RW19 LH cct. The AC114 pilot called ready at 'C' for a VFR SE'ly departure and was given TI on the C560X and then cleared for take-off; TI was also given to the C560X crew.

The Oxford METAR shows EGTK 1600Z 09010KT 9999 FEW040 18/09 Q1011=

**ATSI** reports that the AC114 pilot requested taxi clearance for its VFR flight from Oxford to Wycombe at 1625 and was cleared to hold at 'C' for RW19. Approximately 1min later, the C560X flight established communication with ATC, reporting descending to FL50 direct to Oxford. The pilot was informed of traffic in the hold, which was about

to start an NDB procedure. He was asked if he wished to continue to Oxford (OX) NDB for an ILS approach or to join visually downwind. The C560X pilot opted to route downwind for a visual approach to RW19. The C560X flight was cleared to cct altitude 1500ft on QNH 1011mb, to join LH downwind and to avoid the Brize CTR. (He was, subsequently, advised to route further E to avoid it.)

The AC114 pilot reported ready for take off at 1629. He was informed about the C560X *"...traffic southeast of the field is a Citation Five Six Xray descending for a downwind join runway One Nine runway One Nine you're clear for take off Zero Five Zero Degrees eight knots"*. An intersection departure was approved. The pilot of the C560X requested confirmation of a LH cct and reported at less than 10nm from the airport. He was instructed to report downwind. The AC114 pilot reported rolling, requesting a L turn out, which was approved. Information was updated about the C560X *"...caution for the Citation Five Six Xray less than ten miles south approaching downwind"*. The pilot replied *"that's copied"*. TI was then passed (1630:30) to the C560X flight *"...traffic for you just departing Oxford runway One Nine making a left turn VFR heading southeastbound is an A C One One"*. The pilot responded *"That's copied and we have the field in sight".* On reporting joining downwind RW19 (1630:40), the pilot of the C560X was instructed to report final No 1. Just over 1min later, at 1632, the C560X pilot reported he had received a TCAS RA. The controller replied that the only reported traffic was an aircraft O/H, just turning downwind. No comment was made by the AC114 pilot. Both pilots had been informed appropriately about the presence of the other ac.

UKAB Note (1): The UK AIP promulgates the Oxford ATZ as a circle radius 2nm centred on the longest RW (01/19) 515013N 0011912W from SFC to 2000ft aal; elev 270ft amsl. The ATZ is active Winter Mon-Fri 0630-2230 Sat, Sun, PH 0830-1800 and Summer Mon-Fri 0530-2130 Sat, Sun, PH 0730-1700.

UKAB Note (2): The UK AIP at EGTK AD 2.21 Noise Abatement Procedures Para c states *"After departing from Runway 19, climb straight ahead to 750ft QFE (1000ft QNH) or 1 DME I-OXF, whichever is earlier, before turning right. Aircraft intending to turn left, climb ahead to 1·5 DME I-OXF or until south of Yarnton village (VFR), remaining clear, in all cases, of the Brize Norton CTR."* Para e states *"Whenever possible aircraft joining the circuit should, subject to ATC approval, plan to join on base leg or via a straight-in approach, giving way to traffic already established in the circuit."*

UKAB Note (3): The Clee Hill radar recording at 1631:02 shows the C560X 4·4nm S of Oxford in a slow R turn passing through 010° level at altitude 1500ft QNH 1011mb. Twenty-four seconds later the C560X has steadied on 020° indicating altitude 1400ft when the AC114 first appears on radar in its 1030 position range 1·6nm tracking 120° showing altitude 1000ft and climbing. Sixteen seconds later at 1631:42 the C560X is showing level at 1500ft QNH, 200ft above the AC114, in its 1230 position range 0·6nm. The CPA occurs on the next radar sweep at 1631:50, the C560X now showing a climb through altitude 1600ft having passed ahead of the AC114 at 1400ft, now positioned in its 11 o'clock range 0·4nm. Thereafter the C560X levels at 1800ft QNH as the AC114 passes astern showing 1400ft climbing and then 1600ft on the next sweep in a gentle L turn.

## PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It was clear that this incident occurred close to the Oxford ATZ boundary within Class G airspace where pilots are responsible for maintaining their own separation from other traffic through see and avoid. The controller had passed TI to both flights, the C560X carrying out a visual approach to join downwind and the AC114 departing to the SE VFR; there was no requirement for ATC to provide separation between these flights. It should have been evident from the RT exchanges that both tracks were going to cross at some point and that a good lookout scan needed to be maintained for conflicting traffic. Pilot Members thought that perhaps the C560X should have slowed down sooner whilst integrating into the visual cct to give the crew a better chance of detecting the AC114 early and to manoeuvre, if necessary, to avoid. The AC114 climbing out should have been showing on the C560X's TCAS display which – even given the known azimuth limitations of ACAS/TCAS - should have given the crew better situational awareness of its relative position and flightpath. However, the C560X crew did not see the AC114, its proximity causing TCAS to generate an RA climb which the crew promptly followed. Members agreed that it was this non-sighting by the C560X crew which had caused the Airprox.

The AC114 pilot had assimilated the approaching C560X's flight path and seen it above and to his R as it crossed quickly ahead, content with the separation that pertained and in a position to manoeuvre his ac should it have been necessary. This visual sighting combined with the C560X crew's RA 'Climb' allowed the Board to conclude that any risk of collision had been effectively removed.

## PART C: ASSESSMENT OF CAUSE AND RISK

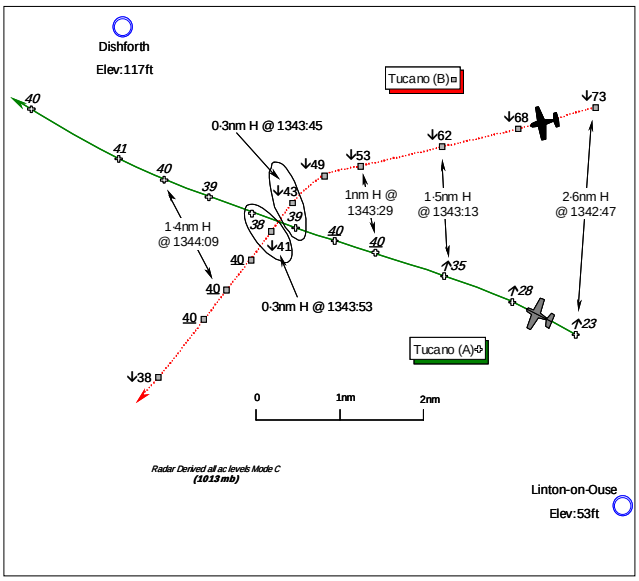
Cause: Non-sighting by the C560X crew.

Degree of Risk: C.

## AIRPROX REPORT No 069/08

## AIRPROX REPORT NO 069/08

| | | |
|---|---|---|
| *Date/Time:* | 30 May 1343 | |
| *Position:* | 5407N 00118W (5¼nm NW of Linton-on-Ouse - elev: 53ft) | |
| *Airspace:* | Vale of York AIAA (Class: G) | |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | Tucano Mk1 | Tucano Mk1 |
| *Operator:* | HQ Air (Trg) | HQ Air (Trg) |
| *Alt/FL:* | FL38 | ↓4000ft |
| | SAS | (QFE 1012mb) |
| *Weather* | IMC In cloud | IMC NR |
| *Visibility:* | Nil | NR |
| *Reported Separation:* | | |
| | 100-200ft V/nil H | NR |
| *Recorded Separation:* | | |
| | Nil V @ 1·4nm H/0·3nm Min H @ 300ft V | |




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

**THE PILOT OF TUCANO MK1 (A)** a QPNI, reports he was departing under IFR from Linton-on–Ouse, IMC in cloud for a navigator instructor-training sortie bound for Prestwick. He was in receipt of a RAS from Linton DEPARTURES (DEPS) who gave a "clearance" to climb to FL40. The assigned squawk of A6132 [preparatory to hand-over to London (Mil)] was selected with Mode C; TCAS I is fitted.

Heading 300°(M) at 180kt, DEPS informed them that another Tucano from the same Station – Tucano (B) - was with Linton APPROACH (APP) on Stud 4, descending ahead of their position and cleared down to FL50. TCAS I contact was obtained on the other ac at a range of 8nm and the display showed the co-ordinated traffic descending from 8000ft. He then saw it descend through 5000ft and approach 4000ft without levelling as expected, he thought on an apparent collision course converging from his 1 o'clock. In the absence of any avoiding action advice from the controller under the RAS, he "felt the need to take independent action" and descended to FL38. At no time did they see the conflicting ac visually as they were flying in IMC in thick cloud. The TCAS I display, now selected to a 2nm scale, showed that the other ac flew directly over them, "missing" them by between 100-200ft, the amount they had descended to remain clear. Once clear, they continued to climb to FL100. ATC was questioned as to the other ac's clearance to which DEPS responded "He was only cleared to FL50". The risk was assessed as *"high"* and an Airprox was reported on RT.

His Tucano has a hi-conspicuity black colour-scheme; HISLs, navigation and landing lights were all on.

**THE PILOT OF TUCANO MK1 (B),** a QFI instructing a student, reports they were recovering to Linton in IMC from FL80, initially under a RIS from Linton APP and then a RAS, with the assigned code of A4503 selected. TCAS I is fitted.

Initially cleared to descend to a height of 2500ft Linton QFE (1012mb) on a heading of 250°(M) at 180kt, he then upgraded to a RAS. They were then instructed to stop descent at 4000ft QFE, whereupon there were two transmissions at once - one on Guard [UHF 243·0MHz] - and another on the APP frequency (they have a listen on Guard facility). Turning Guard off, they asked APP to say the message again but no immediate reply was heard. They were then told to turn L onto 210°(M) and they levelled at 4000ft QFE. APP asked their level and then advised that they were clear of the previously reported traffic – Tucano (A) - and could continue their descent. Tucano (A) was not seen at all – either visually or on TCAS I - hence no avoiding action was taken and their proximity to the other ac not known. He assessed the risk as *"low".*

**THE COMBINED LINTON-ON-OUSE APPROACH CONTROLLER/DIRECTOR (APP)** reports he was giving another controller a break having just completed a break himself. The crew of Tucano (B) free called for recovery

about 7nm NE of the airfield, heading W at FL70 for an instrument recovery. A squawk of A4503 was assigned, the flight identified and placed under a RIS. The Leeming SUPERVISOR then rang on the landline to try to effect co-ordination between Tucano (B) and two ac they had on recovery, one from the NE and one from the NW. It was agreed that Tucano (B) would go no further N than 3nm N of Linton and both their ac would avoid it by 3nm. During this landline conversation with Leeming, Linton DEPS controller asked him for traffic information as he had one ac climbing out - Tucano (A) – so he stated that Tucano (B) was at FL70 under a RIS. DEPS effected co-ordination (face to face) against Tucano (B), however, "this co-ordination did not register" as he was still negotiating with Leeming and subsequently, he has no recollection of the agreement. On conclusion of the co-ordination with Leeming, Tucano (B) was 3nm due N of Linton so he instructed the crew to set the QFE (1012mb) and descend to 2000ft. Immediately after Tucano (B) began descending he noticed a London (Mil) squawk departing from Linton and he recalled the conversation with DEPS about their traffic. The SID from RW03RH is to climb not above FL40 in order to de-conflict with traffic in the TACAN hold which seemed a sensible plan in this instance. APP agreed verbally with DEPS that the inbound Tucano (B) would not be below 5000ft QFE (1012mb), DEPS agreeing his ac would not climb above FL40. As the QFE was 1mb below the SAS it made no difference to the co-ordination if his ac was climbing on the SAS or the QFE. However, he was now somewhat flustered and annoyed with himself because he had not clarified, written down or remembered the original co-ordination. He then transmitted to the crew of Tucano (B) to stop descent at 4000ft: he had actually meant to say 5000ft QFE– but did not, possibly because DEPS - sitting next to him - was at the same time transmitting to the crew of Tucano (A) to stop climb at 4000ft. The crew of Tucano (B) read-back the stop descent at 4000ft and requested a RAS so he upgraded the service to a RAS and corrected the height restriction to 5000ft, explaining that there was traffic climbing out, north bound not above 4000ft. During this interchange he had answered another land line, he believed it was the London Military line, and consequently he has no recollection of what the crew of Tucano (B) read-back. Turning Tucano (B) onto a downwind heading of 210°, he went back to the land-line conversation; at this point DEPS noticed that Tucano (B) had descended through 5000ft on Mode C and warned the crew of the departing Tucano (A). Asking the crew of Tucano (B) to clarify what height they were descending to, the crew informed him that they were now level at 4000ft, but the two ac had now passed one another. Tucano (B) was recovered without further incident.

**MIL ACC** reports that Tucano (B) was on recovery to RAF Linton-on-Ouse on completion of a training sortie whilst Tucano (A) was departing from RW03RH on a navigation exercise requesting climb to FL100 en-route DEAN CROSS for a low-level descent.

The Linton weather was reported as 3500m visibility in Drizzle, with cloud scattered at 500ft and overcast at 900ft (Colour Code YLO1), QFE 1012mb. APP had been in position for 10min in order to give the rostered controller a break. At the time of the incident the SUPERVISOR (SUP) was in the Radar Approach Room (RAR) seated between APP and DEPS. The controller and unit workload was *"light"* and all equipment was fully serviceable.

At 1337:37, DEPS was passed the climbout details of Tucano (A) by the GROUND Controller (GND): heading 300° climbing to FL100 for low-level at DEAN CROSS. DEPS pre-noted London (Mil) - Asst 13 - who issued a squawk of A6132. During this landline call, at 1339:31, the crew of Tucano (B) called APP for an instrument recovery. APP issued a squawk of A4503 and requested details. The pilot reported *"currently North East of the field by 11nm heading West FL80 request radar to SRA and Radar Information Service".* APP identified Tucano (B) [but did not acknowledge the FL] and provided a RIS. Meanwhile, DEPS informed GND that Tucano (A) could "*depart as requested squawk 6132 stud 3*" which was acknowledged. Due to the weather conditions at the airfield, Tucano (A) would still be subject to a 'release' clearance being issued by DEPS prior to departure. At 1340:13, GND requested a release clearance for Tucano (A) from DEPS. The controller scanned the radar screen and spotted the A4503 squawk - Tucano (B). DEPS then said to GND *"I'll just find out what the 4503 is doing before I let him go"*. The subsequent liaison with APP was carried out without using the landline: therefore the exact details of the liaison are not known. At the same time DEPS was liaising with APP who was co-ordinating on landline with Leeming Approach; standard co-ordination phraseology was not used by either Linton APP or the Leeming Approach controller. The APP controller states in his report that DEPS effected face-to-face coordination but the agreement did not register with him as he was still negotiating with Leeming; APP states that he has no recollection of the agreement with DEPS and no details were written down. From the tape transcript, it can be deduced that DEPS believed the APP track would be not below FL60 as at 1340:33 DEPS passed to GND " *COR FL50* [C/S] *released".* Once APP had completed the negotiation with Leeming, DEPS called APP at 1341:11, informing him that "*I've got one warned out…coming out not above FL50…it's er 6132".* APP replied "*going to.?* DEPS responded " *going north so don't come below Six yet. Well, you're not below".* At no time did either APP or DEPS use the word co-ordination. APP responded "*I'm happy RIS, but the 0411 is RAS with Leeming".* At 1342:08, APP

instructed the crew of Tucano (B) to set QFE 1012 [acknowledged by the pilot] and *"descend report level 2000ft"*, again the pilot acknowledged the instruction. At the same time that the crew of Tucano (A) called DEPS *"good afternoon* [Tucano (A) C/S] *passing 1500ft with ident not above 50".* DEPS identified Tucano (A), provided a RAS and instructed the pilot to report level at FL50. At 1342:28 DEPS explained why Tucano (A) was capped at FL50 by passing traffic information on Tucano (B) "[C/S] *stop for traffic right 2 o'clock 3 miles crossing right to left with APP not below FL60."* Three seconds later APP instructed the crew of Tucano (B) "*apologies, stop descent 4000ft, traffic south 2 miles tracking not above…"* but the height was not stated. At 1342:38 the pilot acknowledged the descent to 4000ft and requested a RAS. APP replied "[Tucano (B) C/S] *roger, RAS, make that 5000ft please traffic climbing out not above 4000ft".* It is unclear why APP made the assumption that the DEPS traffic was not above 4000ft but 6 sec after APP had made the statement to the crew of Tucano (B), DEPS instructed Tucano (A) "[C/S] *stop climb FL40".* The crew of Tucano (A) acknowledged the restricted climb but the crew of Tucano (B) did not acknowledge the restricted descent. However, at 1342:49 the crew of Tucano (B) requested, *"say again".* APP did not reply, neither did he notice that the crew of Tucano (B) had not acknowledged the descent restriction as he was now distracted by a landline call from Lon (Mil) about Tucano (A). At 1342:54 DEPS said to APP *"you're at 5 I'm at 4".* However, there is no evidence that APP acknowledged this. Both DEPS and APP continued to pass traffic information to their respective ac about each other in the belief that co-ordination existed and that the crew of Tucano (B) was descending to FL50. The SUP states in his report that at this point he became engaged in conversation with Lon (Mil) about Tucano (A)'s request for low-level at DEAN CROSS. He was observing the radar display over DEPS' shoulder. At 1343:46 DEPS called APP and asked *" Have you stopped at 5 mate? It's just gone through, it's descended through your level."* APP then requested Tucano (B)'s level to which the pilot replied *"4000".* APP then informed DEPS *"He's gone down to 4, sorry, I thought you said 5000 feet. I'll be writing that up then."*

The SUP also states in his report that he noticed the crew of Tucano (B) descending through 5000ft and "immediately warned APP hoping that he could stop the crew of Tucano (B) descending any further". At no point was avoiding action given by either APP or DEPS to their ac and there is no evidence of positive instructions from the SUP to either controller to issue avoiding action. Neither pilot saw the other ac.

The 2 ac involved in this Airprox were the only ac on the APP and DEPS frequencies. The weather conditions were poor resulting in zero in-flight visibility. Although DEPS recognised a potential confliction with the inbound APP track, the attempt at co-ordination was ineffective. DEPS did not use the landline to obtain APP's full attention and DEPS did not use standard liaison phraseology. Therefore, no positive co-ordination agreement was achieved. APP was distracted by landline calls but still appeared to give DEPS the impression that he was listening to the attempt at co-ordination. APP did not appreciate the implications of the poor weather and did not anticipate that the crew of Tucano (B) would require a RAS during the recovery. Therefore, the opportunity to co-ordinate early, when Tucano (B) was under a RIS, was missed. Despite sitting directly between APP and DEPS, the SUP did not identify the lack of positive co-ordination between these tracks; hence SUP did not take positive control of the situation. When it became obvious that Tucano (B) and Tucano (A) were in direct conflict at the same height, neither controller attempted to issue avoiding action, which contravenes the requirement to do so in JSP552. Therefore, the confliction was not resolved by ATC.

UKAB Note (1): The ac departing from Linton-on-Ouse - Tucano (A) – is shown on the Great Dun Fell Radar recording climbing into cover through 2300ft (1013mb) setting course WNW'ly some 2·6nm due S of Tucano (B) which is shown at 1342:47, WSW bound, descending through FL73. The ac converge steadily as Tucano (A) climbs and Tucano (B) descends, at a slightly higher rate, until horizontal separation had decreased to 1nm and Tucano (A) has levelled at FL40, whereupon Tucano (B) turns sharply L onto SW. The ac close to a range of 0·3nm, (B) now descending through FL43 some 400ft above (A) that had descended down slightly to FL39. The tracks cross and the point of minimum horizontal separation occurs in-between sweeps as (B) crosses from R – L almost directly above (A); the two ac are shown again having opened to 0·3nm range, (B) descending through FL41 some 300ft above (A) which had descended another 100ft to FL38 in conformity with the reporting pilot's avoiding action. The ac maintain their respective courses and open steadily, Tucano (A) having returned to FL40 and the point of minimum vertical separation occurring at a range of 1·4nm before Tucano (B) resumes a descent.

**HQ AIR (TRG)** comments that a lack of positive coordination played a major part in this Airprox. Although TCAS did not provide a resolution the information displayed was sufficient for the pilot of Tucano (A) to take effective 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, a report from one of the air traffic controllers involved and reports from the appropriate ATC and operating authority.

The Board recognised that this Airprox was a noteworthy example of the effectiveness of TCAS I. Undoubtedly, even this basic form of ACAS device had proved its worth here and the Board commended the pilot of Tucano (A) for his astute awareness of the developing conflict, resulting from his observation of traffic on his TCAS I display, and his sound airmanship when he elected to take independent action. It was unfortunate that the pilot of Tucano (B) had not similarly recognised the potential for a close quarters situation when he descended and overflew the other ac but from both pilots' perspectives, flying IMC in cloud with zero visibility, under a RAS they were implicitly reliant on ATC to ensure that separation was effected between their ac. Under this light traffic loading, with only one flight under service with each controller, Members were disappointed that ATC had not provided the pilots with the service that they could reasonably have expected under the circumstances. It was unfortunate that no report had been obtained from the DEPS controller involved here - an administrative oversight at the Unit it would seem - so this controller's view of events as they unfolded was not available to the Board. However, the Mil ACC report had focused on the essential elements of this Airprox. The respective reports made it plain that the weather was poor and known to be so. Controller Members were concerned at the suggestion that the APP controller had not appreciated the significance of these poor weather conditions and how that would affect the recovery scenario with the inevitable probability of requests for a RAS and the inherent requirement to separate such traffic. That controllers must be continually aware of the prevailing weather and its implications so as to be able to adapt their plans accordingly is a basic tenet of ATC. Although both DEPS and APP had recognised the potential for a confliction here, controller Members agreed that the attempt at co-ordination was somewhat confused; had not been carried through and was patently ineffective with no positive agreement apparently being reached and clearly communicated to the crews involved. It was evident to controller Members that the root cause of this Airprox was that ATC had not taken positive action to assure separation between these two IFR flights under the prevailing RAS in this IMC situation, even though APP might have thought that he had done so. The importance of adhering to correct practise and procedures, together with utilising standard phraseology, was most important and a salutary lesson from this Airprox. Moreover when the pilot of Tucano (B) acknowledged APP's incorrectly transmitted stop descent at 4000ft, which APP subsequently corrected to 5000ft, critically the controller did not obtain a readback of this revised restriction. Consequently, the pilot of Tucano (B) continued to descend towards Tucano (A) unaware of its height because the traffic information given by APP at this juncture was incomplete. The APP controller's own account had reflected the confused situation here with no positive co-ordination agreement achieved to ensure that prescribed separation was maintained, which the Board concluded was a significant contributory factor.

The Mil ACC report had also identified another important aspect insofar as the SUP did not ensure that controllers were working together and conforming to accepted practice. Members believed that the SUP should have taken more positive steps to ensure that controllers under his command were providing an effective ATS which ensured that measures were in place to assure prescribed separation was maintained as pilots might reasonably expect. Even though the SUP had warned APP of the situation, he did not ensure that avoiding action was issued by either controller. One civilian controller Member was somewhat perplexed that a Supervisor could be implicated in this way. However, military controller Members reaffirmed that this was a significant difference in operational doctrine between military and civilian ATC working practices when it came to supervision of the Approach Control Room. Here the SUP had an implicit overall responsibility to ensure that controllers were operating within established procedures to ensure the safety of traffic under the control of Linton. Moreover, in this light traffic scenario the Board agreed that the SUP might well have intervened and potentially forestalled this occurrence. Members concluded that the absence of positive supervision was another contributory factor here. However, overarching all these other aspects was that APP had instructed the pilot of Tucano (B) to descend to the same level and into conflict with the departing Tucano (A) which, the Members agreed unanimously, was the fundamental cause of this Airprox. The Mil ACC Advisor briefed the Board that the salutary learning points from this Airprox had been recognised and will be stressed amongst the military ATC community.

Focusing in on the inherent Risk here, the Mil ACC report had made it plain that when the controllers became aware that the two ac were in direct conflict at the same height, neither APP nor DEPS attempted to offer avoiding action advice to the respective crews. No positive action was taken by ATC to resolve this conflict and controller Members were especially disturbed at this aspect. Chance had played a part here: it was left to the good judgment

of the pilot flying Tucano (A), IMC in cloud, to identify from his TCAS I that the traffic descending to FL50, that he had been advised about following traffic information, had not actually levelled off and was descending further towards him. Nevertheless it was evident from the RT transcript that the pilot of Tucano (B) had complied with the last instruction that he had received and acknowledged, to descend to 4000ft QFE (1012mb), broadly 30ft above Tucano (A), which the radar recording had revealed was accurately maintaining level flight at the pilot's assigned level of FL40. Even as the two ac closed to a range of 1nm there would have been no indication from the TCAS displayed Mode C that Tucano (B) was not going to level at FL50 as reported to the pilot of (A), because at 1343:29, the ac was still descending through FL53. An excursion of 100ft to FL49, which was evident on the next sweep of the Claxby recording, would not necessarily raise alarm either. However, it was apparent to the Members that the pilot of Tucano (A) must have been paying rapt attention to his TCAS I display as, 8sec later, Tucano (B) is shown descending through FL43, 0·3nm away, with Tucano (A) having descended 100ft lower to FL39. At the next sweep, just after both ac's tracks crossed, in the order of 300ft of vertical separation was evinced by the Claxby recording. But it was reported that in the cockpit of Tucano (A) 1-200ft was displayed. Some Members took the view that the pilot of Tucano (A) had done sufficient to remove any risk of a collision, albeit that safety was not assured with both pilots flying IMC, in thick cloud, with one oblivious to the close proximity of the other. However, the Board was cognisant that the tolerance applicable to displayed Mode C was +/-200ft - the amount by which the pilot of (A) had astutely and rapidly descended to try to effect some separation - a wise decision in these circumstances which, in all probability, prevented an accident. But with such little advance warning of this close quarters situation - a matter of seconds - it was entirely fortuitous that the pilot of Tucano (A) took avoiding action and descended when he did. This convinced the Board that an actual risk of collision had existed in the circumstances conscientiously reported here.

## PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Linton APP descended Tucano (B) into conflict with Tucano (A).

Degree of Risk: A.

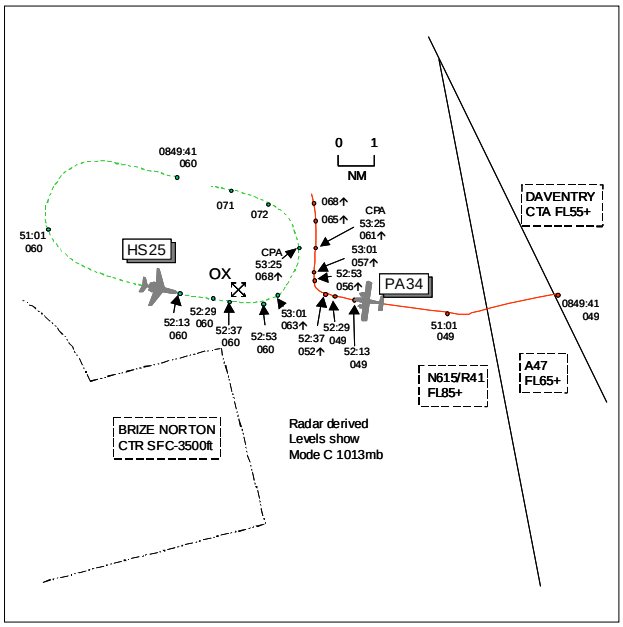
Contributory Factors: Lack of positive co-ordination and Supervision.

# AIRPROX REPORT NO 072/08

*Date/Time:* 30 May 0853

*Position:* 5151N 00116W (2nm NE Oxford Airport - elev 270ft)

| | | |
|---|---|---|
| *Airspace:* | Oxford AIAA | (Class: G) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | HS25 | PA34 |
| *Operator:* | Civ Pte | Civ Trg |
| *Alt/FL:* | FL60 | ↑FL70 |
| *Weather Visibility:* | IMC KLWD | IMC KLWD |
| *Reported Separation:* | 400ft V/1nm H | NR |
| *Recorded Separation:* | 700ft V/0·5nm H | |




## PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

**THE HS25 PILOT** reports inbound to Oxford IFR and in receipt of an ATS from Oxford on 125·32MHz squawking 3710 with Modes C and S. They were maintaining FL60 and 210kt in the OX hold for RW01, in IMC and the Airprox occurred whilst they crossed the beacon and were turning onto the outbound W'ly leg of the hold. As they did so a TCAS RA 'climb' warning was received on traffic about 5nm away so the FO, PF, disengaged the A/P and followed the TCAS guidance whilst he, the Capt PNF, informed ATC 'TCAS climb'. They initially climbed about 800ft before the warning ceased; however the TCAS contact was also climbing so further climb avoidance was required. They eventually levelled at FL72 heading W and maintained track until approximately 7nm from the beacon. The other ac had approached from the NE, he thought, and turned behind them. Oxford ATC stated they were unaware of any other traffic other than an ac cleared by Brize Norton radar to join the hold at FL70. They were then cleared to descend to 3500ft and return to the beacon to commence their approach. At the CPA the other ac passed 400ft below and 1nm laterally clear and he assessed the risk as high.

**THE PA34 PILOT** provided a short report stating he was totally unaware of the Airprox but provided brief details of his local IFR training sortie from Oxford. At the time of the incident he was climbing to FL70 working Brize Radar on 124·275MHz at 120kt in IMC and did not see the reporting ac, he thought.

**THE OXFORD ADC/APP** reports the HS25 was in the OX hold for RW01 being held at FL60 owing to outbound traffic. The PA34 was pre-noted inbound from Cranfield through Brize Radar and its allocated level was FL70, to be level at FL70 due to holding traffic at FL60. The HS25 pilot reported a TCAS alert and climbed but she did not hear the pilot say he was climbing. She was not aware of any conflicting traffic. At some point she had cause to question the HS25's level and on realising that it was FL70 she passed TI on the PA34 which was not yet on frequency. She arranged descent for the HS25 outbound on the NDB procedure to resolve the confliction. Shortly after this the PA34 flight called on frequency.

The Oxford METAR shows EGTK 0850Z 34005KT 9999 BKN015 OVC017 14/12 Q1013=

**THE BRIZE NORTON LARS** reports the PA34 was routeing from Cranfield to Oxford at 2500ft London QNH 1013mb. He issued a squawk of 3710 and on request provided a RIS. The PA34 pilot requested a level for the Oxford OX NDB hold and passed an estimate of minute 50. The OX hold was busy owing to poor wx conditions and the requirement for all traffic to fly the procedure and the only level available to the PA34 was FL70. At this time the PA34 was at WCO under CAS, base level FL55, so he climbed the flight to FL50 and advised the pilot that a step-climb would be given as the airspace levels above the ac became higher. His intention was to climb the PA34 to FL60 as the ac passed under the airspace fillet 8nm E of Oxford, base FL65, and then to FL70 after

the W edge of the airspace fillet 6·5nm E of Oxford. He became distracted by other ac and did not climb the PA34 to FL60 as intended, instead climbing the flight to FL70 as it passed the W'ern edge of the CAS fillet, base FL65. He called the traffic in the OX hold at FL60 range 5nm and suggested a turn onto N to avoid the hold. He then saw the traffic in the hold also turning onto a N'ly heading and climbing so he called the traffic, W range 1nm tracking N indicating 800ft above, which the PA34 pilot acknowledged and stated he was visual with the traffic. Later he was told that Oxford had told Brize Supervisor that the ac in the hold [the HS25] had had a TCAS TA and wished to file against what was thought to be an ac that Brize had worked earlier towards DTY. He told the Supervisor that he believed the traffic had been the PA34 and not the DTY joining traffic.

**ATSI** comments that the HS25 crew established communication with Oxford APP/TWR, at 0837, reporting passing FL53 climbing to FL60. The flight was cleared to enter the OX NDB hold at FL60 to expect a delay due to other traffic. Approximately 8min later, Oxford informed Brize about the HS25 and confirmed that a further telephone call would be made, when the aircraft would be able to make its NDB approach to RW01. (This procedure requires the permission of Brize Radar.) During the telephone call, it was arranged between the 2 units that the next inbound would have FL70. Due to some words being unintelligible in the telephone recording, it is not possible to confirm the c/s of this traffic: however, the subject PA34 flight subsequently reported inbound at FL70.

At 0852:50, the pilot of the HS25 reported *"TCAS RA climbing"*. The controller assumed the TCAS alert was against an outbound ac that had been transferred to Brize. This would only have been climbing to FL50 until radar separation existed. The pilot of the HS25 commented that the other traffic was 500ft below. The radar recording reveals that the PA34 was the other traffic involved. It was approaching OX from the E climbing to FL70, not in contact with Oxford. Oxford ATC, not being equipped with radar, was not aware of the confliction. The HS25 flight reported maintaining FL70. This message was not registered by the controller but, subsequently, as soon as it was apparent the ac had climbed to that level, it was given descent to avoid the PA34 expected at FL70. The PA34 pilot contacted Oxford at 0855, at FL70, by which time the HS25 was passing FL60 in descent.

The LOA between Oxford and Brize, states, with regard to the Training School operating the PA34, that *'the pilot will be given the level for the OX NDB and the aircraft is to be at the level/altitude before being released to the Oxford controller unless additional coordination has been affected. The aircraft should be released at a range no closer than 6 nm from the OX having been passed any relevant traffic information'*.

UKAB Note (1): The OX hold is LH 1min racetrack inbound QDM 100°.

**MIL ACC** reports that at 0840:59 the PA34 flight first made contact with the Brize Norton Zone Controller (LARS) on frequency 124·275MHz, requesting a RIS. The PA34 was inbound to Oxford Airport routing via WCO from Cranfield. At 0851:31 the HS25 was established in the OX NDB hold at FL060 in IMC in receipt of a procedural service from Oxford ATC on frequency 125·325MHz. The CAS (Class A) in this area is complex and required the PA34 to be given a stepped climb to meet the requirements of the clearance issued by Oxford ATC. The NDB hold at Oxford Airport is situated in Class G airspace beneath Class A airspace, base level FL85. The PA34 was cleared by Oxford through LARS to the OX at FL070 due to the HS25 in the hold at FL060.

A LoA is in place that details the air traffic procedures to be applied between Oxford ATC and ATC at RAF Brize Norton. These procedures include: the ac being level before being released to Oxford and the aircraft being no closer than 6nm from the Oxford overhead. The OX NDB is 6·5nm from the edge of the Class A airspace [A47] with a base level of FL65 and 8·5nm from the edge of the Class A [Daventry CTA] base level FL55. Ac recovering from the WCO area with a high level for the OX hold require a stepped climb under this airspace.

At 0840:59 the PA34 flight free-called LARS on frequency 124·275MHz *'Brize Radar PA34 c/s request Radar Information Service'.* LARS responded *'PA34 c/s Brize squawk 3710'*. At 0841:40 the PA34 pilot passed his details, '*PA34 c/s from Cranfield to Oxford routing via WCO currently IMC maintaining 2500ft 1013 request RIS and a level for the hold OX, estimate OX time 4….50'.* The PA34 was identified by LARS, *'PA34 c/s identified 2500ft London QNH 1013 Radar Information'.* The service was correctly limited due to the altitude and traffic was called. At 0846:08 the PA34 pilot requested, *'Brize PA34 c/s approaching WCO and do you have a level at the hold for the OX please'.* LARS responded, *'PA34 c/s just negotiating with Oxford they have something in the hold at FL60 at the moment your level is FL70'.* The PA34 flight was given a stepped climb to FL50 under Class A airspace.

[UKAB Note (2): The PA34 was cleared to climb to FL50 at 0846:50 and 2min later its pilot reported approaching FL50 and was told *"further climb in three miles"*, which was acknowledged.]

In the next transmission at 0849:00, LARS transmitted *'??? segment of controlled airspace which you're underneath at the moment is base FL55 then a filament of FL65 and when clear of that then I'll call the traffic in the hold. It won't be a factor*'. The PA34 was still at FL50 and acknowledged. At 0852:13 LARS transmitted, *'PA34 c/s climb FL70, traffic 12 o'clock 5 miles reciprocal heading, in the hold at FL60'.* The PA34 pilot acknowledged the climb. The radar recording is consistent with the voice transcript received from Brize Norton ATC and shows the relative positions of both ac as just L of 12 o'clock at 5nm. At 0852:25 the LARS controller transmitted, *'PA34 c/s if you turn onto a Northerly heading just to avoid traffic in the hold'.* The PA34 pilot acknowledged, *'OK Northerly heading PA34 c/s just confirm an NDB100'* [IAP to aerodrome using NDB/DME inbound QDM 100°]. The LARS controller responded, *'It will be affirm I've just not got you above the hold traffic area enough'* which the PA34 pilot acknowledged at 0852:40.

[UKAB Note (3): The radar recording at 0852:37 shows the PA34 in the HS25's 1130 position range 2·6nm just commencing the R turn and climbing through FL52, 800ft below. As the HS25 pilot reports his TCAS RA on the Oxford frequency, at 0852:50, the radar recording shows the HS25 at FL60 just commencing its L turn outbound at the OX NDB with the PA34 in its 11 o'clock range 1·5nm and 400ft below but climbing. Eight seconds later at 0853:01, the HS25 is seen passing through FL63, in response to the TCAS RA, with the PA34 1·1nm to its NE also climbing, passing through FL57, 600ft below.]

LARS then updated the TI at 0853:22 with, *'PA34 c/s previously called traffic is West 1mile tracking North indicating 800ft above'.* The radar recording at 0853:25 shows the HS25 and PA34 at the CPA 0·5nm and 700ft on Mode C. The PA34 pilot responded, *'Copied traffic looking PA34 c/s … and visual'.* The PA34 pilot later reported at 0854:37 *'PA34 c/s maintaining FL70*' before LARS's final transmission, *'7000 125·325 thank you very much for your help PA34 c/s'.* The AIR (C)s submitted by Brize Norton ATC all relate to a busy working environment although the tape transcript only reflects a 9min period with 1 ac on frequency.

The LARS controller was distracted from issuing an intermediate level of FL60 due to his reported workload, thus delaying the PA34's climb from FL50 to FL70. However, the requirements of a RIS were met and pertinent TI was passed to the PA34 allowing the pilot to become visual with the HS25. The OX NDB hold is within Class G airspace and is a busy procedure used by Oxford. Its proximity to Class A airspace provides a challenging task to meet the requirements of the LoA when recovering ac are at higher than normal levels from the E. SATCO at Brize Norton has highlighted these requirements to her staff with the guidance that vectors may be required to remain clear of the hold until level at the cleared FL for the procedure.

## PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members opined that LARS had formulated a plan but had not taken all possible factors into account when executing it. To comply with the LoA, he was tasked with transferring the PA34 to Oxford at FL70, separated from the HS25 in the OX hold at FL60 and no closer that 6nm from the OX. It was clear to Members that it would always be a challenge for the PA34, flying on a direct track, to climb 2000ft in the 2·5nm between the time it passed the airspace boundary 8·5nm to the E and before it reached 6nm from the OX when transfer to Oxford was required. However, LARS omitted to give the intermediate step climb to FL60 and instead instructed the PA34 flight to climb directly to FL70, passing TI on the HS25 when it was head-on with separation at 5nm but rapidly reducing. Although this was technically within the spirit of a RIS, LARS was still working the PA34 and had not complied with the LoA, effectively clearing the PA34 flight to climb into conflict with the HS25 which had caused the Airprox.

Pilot Members were surprised that the PA34 pilot had accepted the clearance to climb to FL70 having been told that the HS25 was on a reciprocal track only 5nm away at FL60. The PA34 pilot was only in receipt of a RIS but flying in cloud in IMC reduced the pilot's ability to fulfil his responsibility to 'see and avoid'; a RAS would have been a better service option. Members opined that he had been misguided by LARS when told previously of the proposed step-climb and that he would be informed of the traffic in the hold and '...it won't be a factor'. It was only at the last minute that LARS suggested that the PA34 pilot turn onto a N'ly heading to avoid the holding HS25. By then it was too late, the situation further exacerbated as the HS25 also turned to the N to follow the holding pattern

track. Updated TI from LARS allowed the PA34 pilot to see the HS25 but only after it had climbed following a TCAS RA warning. The HS25 crew were undoubtedly surprised when TCAS was triggered but had reacted promptly and followed the TCAS guidance. However they became concerned when, after levelling-off, further climb was required as the PA34 pilot continued his climb from beneath. Eventually the flightpaths diverged and separation was restored. Although this had had the potential for being a more serious incident, the prompt actions taken by the HS25 crew were enough to persuade the Board that any risk of collision had been quickly and effectively removed.

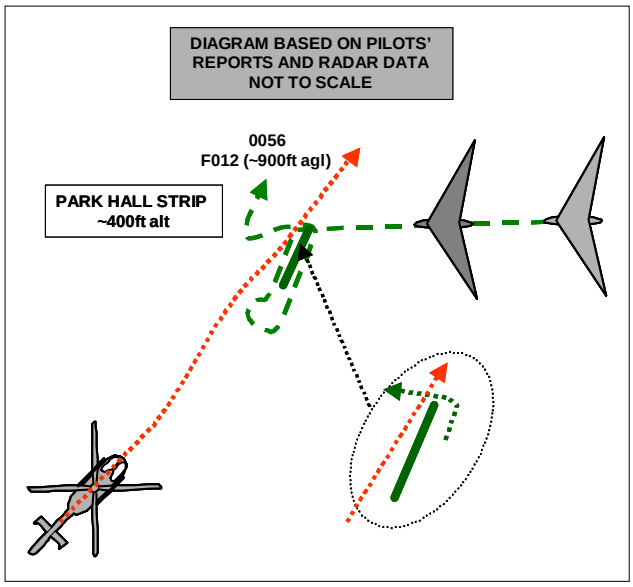
## PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Brize Norton LARS did not comply with the LoA and climbed the PA34 into conflict with the HS25.

Degree of Risk: C.

## AIRPROX REPORT NO 073/08

| | | |
|---|---|---|
| *Date/Time:* | 31 May 1428 (Saturday) | |
| *Position:* | 5300N 00122W (10nm N of East Midlands Airport) | |
| *Airspace:* | Lon FIR | (Class: G) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | Microlight | EC135 |
| *Operator:* | Civ Pte | Civ Pol |
| *Alt/FL:* | 850ft | 1000ft agl |
| | (RPS NK) | (QNH NR) |
| *Weather* | VMC CAVOK | NR CAVOK |
| *Visibility:* | 10-20nm | >10km |
| *Reported Separation:* | | |
| | 0 V/150m H | 0 V/1.5nm H |
| *Recorded Separation:* | | |
| | NR | |




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

**THE MICROLIGHT PILOT** reports that he had flown from Cromer with a passenger in a black, red and white ac with strobes switched on but with no transponder fitted and with another ac in trail; they were listening out on the East Midlands Approach frequency. They had flown directly over Hucknall airfield in contact with them and were in a slow descent to Parkhall Airfield for landing. They had arrived overhead at about 1500ft, noting that the RW in use was 01/19 (both of which have a Westerly circuit). He had initially flown overhead, then headed S to look at the wind sock as the second [microlight] aircraft was approaching the overhead. After viewing the windsock and heading S, he made a tight left 180° turn onto a track of approximately 010° at 70kt. He started a further left turn to join the circuit, to head about 280°, and was at about 850ft QNH [about 450ft agl] when he saw a blue and yellow helicopter at exactly the same height approaching from his left on a heading between N and 030°. Initially, he waited as the proximity did not over-concern him but a second or two later he became concerned that the pilot had not seen them and by that time they were probably about 5sec from a collision. He made a rapid descent to avoid a collision and descended away but was very concerned about the downwash. The helicopter pilot took no avoiding action and continued to fly away on the same heading and height.

He was advised later by the pilot of the following ac that the helicopter had also flown close to them and a pilot on the ground reported that the helicopter had flown very close to both ac.

The helicopter had overflown, at circuit height, a non-radio airfield housing a Microlight school with solo student pilots. He considered that since the helicopter pilot was locally based, he should have known of and avoided the airfield. Further, the helicopter had been in receipt of a service, presumably a FIS, from East Midlands on their APR frequency and they had not advised its pilot of the site. He considered that the helicopter pilot did not exercise proper care or regard when overflying the active airfield and may not be aware of the circuit height.

He provided a GPS log of the relevant part of his flight.

UKAB Note (1): Park Hall microlight site was first notified to the CAA on 10 March 2008 and was promulgated in the next possible amendment to the UKAIP, ENR 5-5-4-3 (AMDT 6/08) effective on 5 June 2008 (after the incident). It was marked on Edition 8 of the ¼ Mil VFR chart also effective on 5 June 2008. There is no legal requirement for Microlight sites to be notified to the CAA.

**THE EC135 PILOT** reports that he has over 27 years experience of aviation and surveillance operations. He was flying a blue and yellow TCAS-equipped helicopter with 3 HISLs; nav lights and the landing light switched on, squawking 0056 with Mode C and in receipt of a FIS from East Midlands. While recovering to his base [about 4nm N of the incident position], heading 030° at 125kt, he first saw a small fixed wing ac [probably the lead microlight]

in his 11 o'clock position at about 1.5nm. This ac was heading roughly N so he changed his heading 10° to the right [before the above diagram starts] to increase the horizontal separation whilst continuing his lookout scan. His rear observer then called, just as he also saw it, a microlight [UKAB Note (2): From the microlight pilot's report (above) and the reported position and distance, it is likely that the ac called by the observer was the second of the two microlights]. This ac was to his right and slightly behind (behind the 3 o'clock position) about 1.5nm away and was also tracking about N. Now in visual contact with both ac, he noted that they were at the same level as him. He maintained his heading and speed; the fixed wing ac [the lead microlight] maintained its heading and level as their separation distance increased. A few seconds after first observing the [second] microlight, it turned right onto a more Easterly heading, maintaining level flight, and continued turning until he lost sight of it well away and behind in his 5 o'clock position. He could not determine this microlight's colour as it was too far away and he thought that the distance and its small size made it difficult to see which contributed to his acquiring it slightly late.

As he commenced his descent to his base he heard an ac inform East Midlands that 'the microlight site near Ilkeston was active' but neither he nor his unit was aware of any such site at the time and none was notified or marked on VFR charts.

At no time during the encounter did he or either of the two also very experienced observers feel that there was any threat to flight safety or any chance of a collision and he therefore considered that the situation did nor warrant any reporting action; he therefore assessed the risk as none.

The above is his best recollection of events as he was not made aware of the incident until 2 weeks after the event.

**THE EC135 OPERATOR** reports the unit was notified of the incident in a telephone call from the Park Hall Flight Safety Officer (FSO) who was the pilot of the fixed wing ac described in the EC135 pilot's report. This notification was received almost 2 weeks after the incident took place and was followed by a more detailed e-mail. Prior to the event, the unit had been aware of a Farm Strip at the location but this was largely due to the existence of a Radio Control Model Helicopter Club that operates from a field on the side N of the site. The model ac club routinely informs them of any significant activity.

They were able to narrow the helicopter involved to one of 2 flights that were in the area that day as there were no timings on the e-mail received. On checking the AIP, it was noticed that the Park Hall Farm site was first listed in amendment 6/2008 which came into effect on 5th June 2008, after the incident had taken place. Since then he has contacted the Microlight Club FSO to discuss ways of avoiding a recurrence. The FSO told him that the club is expanding and is going to be a Microlight training school. There will be a corresponding increase in activity at the site on the 150 days that their planning permission allows. They agreed that the best way to avoid any future incidents would be for them to contact the helicopter unit by telephone on the days when the strip is active. The FSO has also notified them of other Farm Strips in the area that are not promulgated either in the AIP or the current Lockyears guide; these have been marked on the Ops Room map.

**ATSI** reports that there were no ATC causal factors. The EC135 was being provided with a FIS by East Midlands APR and had reported *"shortly descending to Ripley"*, its base. The microlight was not on the frequency at the time

UKAB Note (3): The helicopter shows on the recording of the Clee Hill radar throughout. A primary only contact, presumed to be the light ac referred to by the helicopter pilot (or, as explained above, the reporting pilot's microlight) appears at 1426:23 in the helicopter's 1 o'clock position manoeuvring in the incident area. It can only be seen intermittently as it crosses from right to left across the helicopter's track at a distance of just over ½ nm. The helicopter passes virtually over the reported position of the incident at 1428:44 at FL012 (~900ft agl).

UKAB Note (4): The East Midlands METAR was:

311450Z VRB03KT 9999 SCT048 19/11 Q1017=

and the Barnsley RPS was 1012mb.

## PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members found it difficult to reconstruct with any degree of accuracy the precise sequence of events since the radar data did not for the most part show the microlights and the pilots' reports were quite different.

The Board considered at some length the sighting issues but, since both pilots reported seeing the other ac and reacting fairly promptly, it was agreed that there had not been a late sighting by either pilot. Although the radar recording verified that the EC135 had flown fairly close to the - at that time, unpublished - microlight site, neither microlight was showing on the radar recording. It was not therefore possible to determine precisely where the reporting pilot's ac was at the exact moment of the Airprox. Notwithstanding the experience of the pilots and reports from other observers, the Board followed its normal practise and gave equal weighting to the reports by the respective pilots and disregarded other aspects. Since their reported separation and description of events was markedly different however, Members could not reconcile the differences. That being the case, the Board agreed that the actions of both pilots appeared reasonable and completely understandable and, at the time, the EC135 operator had no apparent means of knowing about the existence of the microlight site. The Board therefore concluded that the incident had been a conflict in the FIR.

As regards the degree of risk, Members concluded that although information was scant, since both pilots had seen the opposing ac in fairly good time, it was unlikely that they would have allowed the situation to develop to an extent that there was any risk of the ac colliding.

One Member pointed out that the EC135 operating site is published, known to be busy and is close to the microlight site - the microlight operator could have been more pro-active in informing them and other units such as East Midlands of their activities. Equally, Members noted that although not required to do so, the microlight operator had reported the existence of the airfield to the CAA for promulgation. Unfortunately the publishing timescales had been such that the information was not disseminated before the incident took place.

The Board noted and endorsed the swift follow-up actions initiated by the EC135 operator.

## PART C: ASSESSMENT OF CAUSE AND RISK

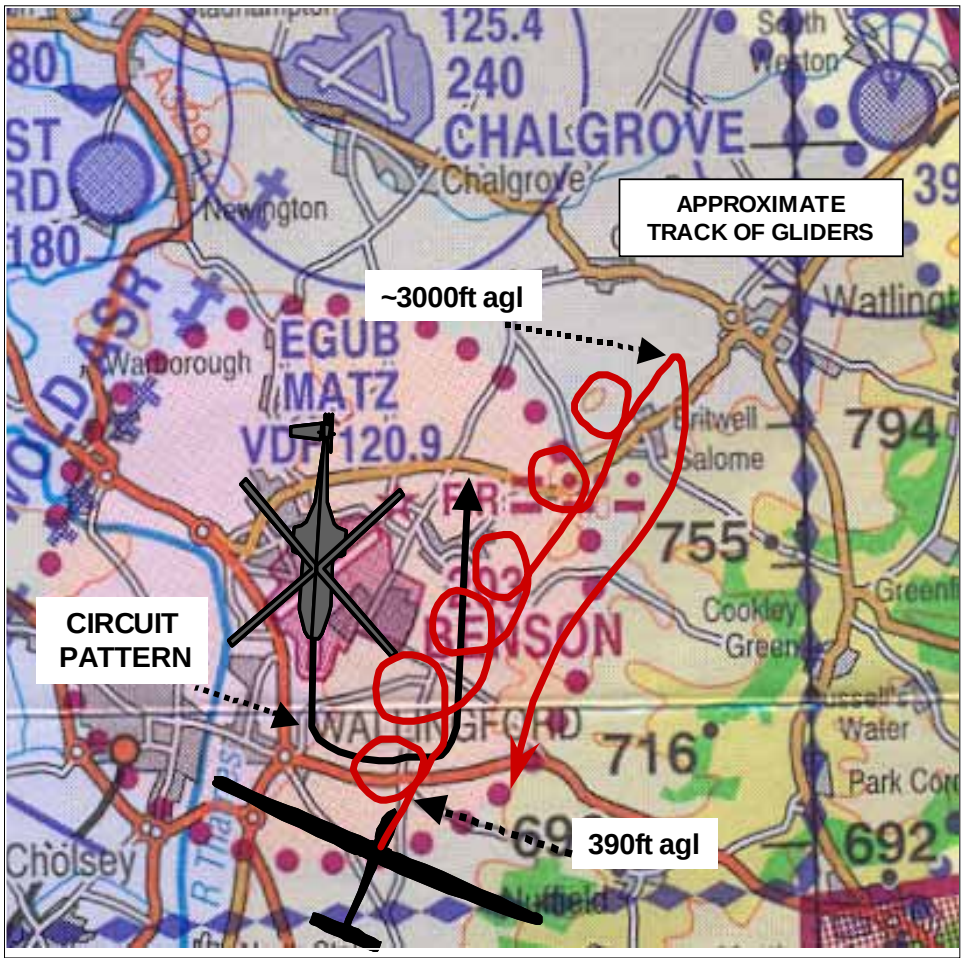
Cause: Conflict in Class G airspace resolved by both pilots.

Degree of Risk: C.

## AIRPROX REPORT No 074/08

## AIRPROX REPORT NO 074/08

| | | | |
|---|---|---|---|
| *Date/Time:* | 4 Jun 1217 (Wednesday) | | |
| *Position:* | 5136N 00105W (Vicinity of Benson - elev 203 ft) | | |
| *Airspace:* | Benson ATZ | (Class: G) | |
| | Reporting Ac | Reported Ac | Reported Ac |
| *Type:* | Merlin Mk3 | DG303 Glider | LS6c Glider |
| *Operator:* | HQ JHC | Civ Club | Civ Club |
| *Alt/FL:* | 350ft ↑ | 600ft | 600ft |
| | (QFE 1009mb) | (Booker QFE NR) | (Booker QFE NR) |
| *Weather* | VMC (CLBC) | VMC (CLBC) | VMC (CLBC) |
| *Visibility:* | >10nm | >10km | >10km |
| *Reported Separation:* | 0ft V/400m H | NK | NK |
| *Recorded Separation:* | NR | | |




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

**THE MERLIN MK3 PILOT** reports heading 190° at 100kt on climb-out from Benson RW19, squawking as directed with Mode C. As they passed through 350ft [agl], the LHS pilot saw a white glider circling 400m away in their 10

o'clock and well inside the ATZ. They took avoiding action by turning hard right and expediting their climb to 1000ft, quickly discussing the best course of action with ATC to obtain both vertical and lateral separation. The manoeuvre was however limited by their low speed and under-slung load. As they reached 1000ft the LHS pilot saw a second glider, which he had not previously seen, in close formation with the first. While on the downwind leg he informed ATC of their intention to file an Airprox and the ac was recovered to Benson without further incident. He assessed the risk as being high.

**THE DG303 GLIDER PILOT** reports flying a local soaring flight from Booker. They were thermalling at 50kt just to the E of Benson and became unable to find any lift so he decided to land [apparently at Benson]. While approaching the airfield from the SE he was aware of a helicopter in the centre of the airfield. On turning downwind, he found a thermal and turned in the lift at which point another Booker-based glider (an LS6c) joined him. While in the thermal he briefly saw the helicopter climbing out to the S. After a few minutes, another [third] glider, a Libelle (not Booker based) also joined them in the thermal.

He sent a printout of the relevant part of his logger trace with his report and also the relevant part of the logger file.

He apologises for any concerns that he may have caused and in particular for not having his radio set to the Benson frequency. He assessed the risk as being medium.

**THE LS6C GLIDER PILOT** reports flying a local soaring flight from Booker and had been thermalling at 50kt when he got low in strong sink to the SE of Benson. He saw another Booker-based glider starting to thermal and so he joined it from the SE. He did see movement on the Benson RW but being to the SE and thermalling away from the airfield in an Easterly wind, he did not see a problem.

He assessed the risk as being low.

As he climbed away, another [third] glider that he did not recognise joined them.

In hindsight, he should have called Benson much earlier in the flight and passed his intentions.

He enclosed a trace of his flight in Benson area.

He apologised if he caused a problem and has learned from this incident.

**THE BENSON ADC** reports that the Merlin had just taken off from the [day] Load Park with an under-slung load to fly a visual circuit at 500ft QFE. As the pilot turned crosswind he reported that he had seen a glider and was going to take avoiding action on it. The pilot requested a climb to 1000ft, which he approved. He reported the incident to the ATC Supervisor. At this point he noticed the glider that was circling within the ATZ at the beginning of the downwind leg at approximately 300-500ft agl. The Merlin avoided the glider and reported seeing another one but he did not ask to avoid it; the pilot reported that he was going to file an Airprox against the first glider. After closer inspection of the area, 3 gliders were seen and all appeared to be inside the ATZ and a further 2 gliders were seen, apparently in the MATZ, but it was difficult to tell if they were inside the ATZ. The gliders were all trying to climb and were tracking N but to the E of the airfield. He did not receive any calls from any of the gliders. He noticed that there was some cloud moving to the N that was E of the airfield and this made it difficult to see the gliders as they circled.

UKAB Note (1): Although there are several intermittent primary returns in the area, the incident is not seen on recorded radar. Both glider pilots helpfully provided track data from their data loggers. The track on the diagram above, although only a pictorial representation, is accurate. One glider was orbiting to the right, the other to the left. The first glider descended to an alt of 180m (590ft amsl or 390ft agl) in the Benson ATZ. From the reports it is assumed that the second glider was at a similar height. Both gliders therefore entered the Benson ATZ.

UKAB Note (2): The pilot of the 3rd glider was traced but declined to provide a report. He stated that he was at least 200ft above the top of the ATZ. He did not provide logger data.

UKAB Note (3): The Benson ATZ is a circle 2nm radius up to 2000ft aal (2203ft amsl).

UKAB Note (4): The Benson METARS were:

## AIRPROX REPORT No 074/08

EGUB 041150Z 26005KT 9999 FEW032 17/09 Q1017 BLU NOSIG

EGUB 041250Z 25007KT 9999 SCT038 17/08 Q1016 BLU NOSIG=

**MIL ACC OPS** reported that there were no ATC aspects to this incident.

**HQ JHC** did not comment.

### PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots all 3 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 is no legal requirement to do so, Members unanimously (including the specialist gliding Member) considered that it would be good airmanship to call Benson APP/TWR before entering their MATZ. In this incident neither of the glider pilots had done so (from the transcript) and therefore had entered the Benson ATZ without permission, in contravention of the ANO (Rules of the Air Rule 45). Although accepting totally that the pilots had been preoccupied with finding an area of lift so that they would not have to land out, Members found it even more exasperating that both pilots directly involved were radio equipped but did not use them in a situation when an RT call would most likely have prevented this Airprox. Although the pilot of the 3rd glider (the Libelle) reported that he had been above the ATZ, the specialist gliding Member observed that this ac must have been fairly close to the DG303 for the pilot to have identified it as a Libelle and noted that it was not one of those based at Booker. Indeed, Members had no reason not to accept the ADC's report that at the time of the incident there had been 5 gliders in the Benson MATZ, none having called Benson APP or TWR. The specialist gliding Member informed the Board that it is good airmanship to anticipate and always plan for sink and to pre-select suitable land out areas when operating away from base.

The Board was informed that when flying with an underslung load, helicopters can be very restricted in their ability to manoeuvre. Care must be taken to maintain significant positive G on the load and not to induce any oscillation as well as not making any sudden changes of flight parameters. In this case however, the circuit was not busy and the Merlin pilots had seen the gliders closest to them early enough to manoeuvre, primarily in the vertical plane, without it being late or excessive thereby obviating any risk of collision.

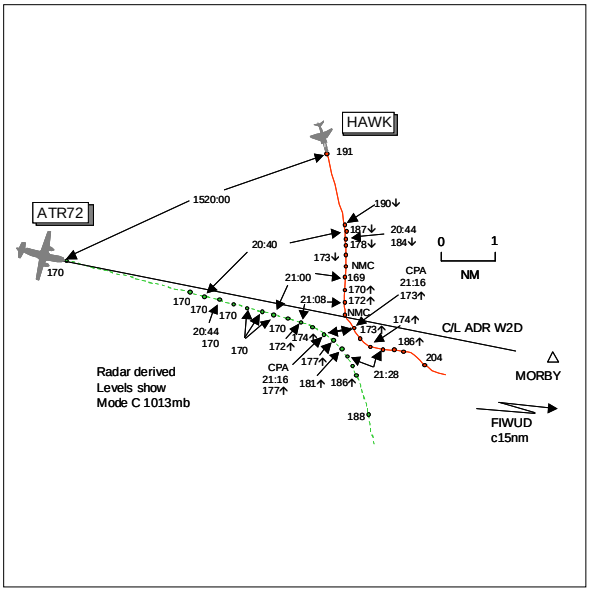
### PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The gliders descended into the Benson ATZ without permission and flew into conflict with the Merlin which was restricted in its ability to manoeuvre.

Degree of Risk: C.

# AIRPROX REPORT NO 075/08

| | | |
|---|---|---|
| *Date/Time:* | 5 Jun 1521 | |
| *Position:* | 5356N 00336W (23nm WNW Blackpool) | |
| *Airspace:* | ADR/Warton RASA (Class: F/G) | |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | ATR72 | Hawk |
| *Operator:* | CAT | MOD DE&S |
| *Alt/FL:* | FL170 | FL180↓ |
| *Weather* | VMC CLOC | VMC CLBL |
| *Visibility:* | 20km | >15nm |
| *Reported Separation:* | NR | 2-300ft V/1-2nm H |
| *Recorded Separation:* | 400ft V/0·5nm H | |




## PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

**THE ATR72 PILOT** reports en route to Leeds IFR and in receipt of an ATS from Manchester squawking with Mode C. Routeing direct to POL at FL170 heading 095° and 220kt, they received a TCAS TA and prepared themselves for a possible RA. The traffic was approaching from their L so a good lookout was kept. When an RA occurred, TCAS commanded a climb initially at 2000fpm whilst ATC instructed them to take avoiding action and make a R turn onto 180°. He could see the traffic, a Hawk, climbing as well, at which point TCAS commanded climb at 4000fpm which was beyond the performance of their ac. They increased the angle of bank to 40° in their R turn at which point they could see the Hawk turning L away from their ac. When clear of traffic they continued to POL without further incident.

**THE HAWK PILOT** reports flying a local sortie from Warton and in receipt of a RIS from Warton on 341·775MHz squawking 3674 with Mode C. The visibility was >15nm flying 3000ft above cloud but in between layers in VMC and the ac was coloured black with HISLs switched on. The sortie profile was general handling (stalling exercise) and he had been informed of traffic on the ADR at FL170. The student, an experienced Hawk pilot, had taken some time to set up the exercise and he, the instructor, assessed that there was sufficient height to recover without going below FL180, an agreement he had made with ATC. Unfortunately the student made a fairly aggressive recovery which resulted in the ac going through FL180. He, the instructor, had been watching the ADR traffic, a high wing twin engine turboprop coloured white, for several seconds earlier on roughly the same heading and then noticed the other ac's nose rise into a climb as their ac descended through FL180 heading 150° at low speed with low energy. He considered that he would be unable to raise their ac's nose and climb above FL180 again so he took control and continued the descent and turned L away from the other ac. He estimated the other ac passed 200-300 ft above and 1-2nm away at the CPA, assessing the risk as low.

**THE WARTON APR** reports the Hawk departed Warton and called on his frequency at 1513 and was provided with a RAS, initially climbing to FL50. One minute later the flight was given climb into the airspace block FL50 to FL190 and was asked to report when able to accept a RIS for manoeuvring; this occurred 1min later. Two minutes later at 1517 the Hawk pilot requested to operate up to FL210 owing to poor Wx in his original airspace block. It was at this point he gave TI on the ATR72 transiting E'bound on ADR W2D and asked the pilot if he would be prepared to restrict his base level against it. The pilot agreed and he was assigned the airspace block FL180 to FL240. MACC IOM Sector did not call as expected to coordinate but he was content that safety had been assured and that coordination could be effected immediately should MACC call. Shortly after this the Hawk pilot requested use of another frequency owing to breakthrough and after he called on 341·775MHz his operating block of FL180 to FL240 was reiterated. At 1520 updated TI was given on the ADR traffic which was SW of the Hawk range 4nm E'bound. One min later at 1521 the Hawk's Mode C disappeared and then indicated below FL170, from memory FL165. In case this was a spurious readout the Hawk pilot was given further TI on the ATR72 which was SW of

him by 2nm at FL170 and that it was understood that the Hawk would not be below FL180. The pilot apologised stating he was recovering from a stall but was visual with the ATR72. The ATR's Mode C was then seen to climb and the ac appeared to turn S. One minute later his colleague telephoned MACC IOM Sector to explain what had happened and was informed to expect an Airprox to be filed as avoiding action and a TCAS RA action had been taken. He commented that this was an extremely disappointing incident in that despite no formal request for coordination [from MACC], he believed he had taken positive action, beyond the terms of the service he was providing, to assure safety.

**THE MANCHESTER IOM RADAR CONTROLLER** reports operating as an OJTI and had just assisted in splitting the sector. The ATR72 was transferred to them at around KELLY by the WAL radar controller during the split. The ac had been coordinated out of the sector at FL170 RFD [released for descent]. His trainee transferred the ATR72 to N Lower Sector between VANIN and MORBY which he pointed out was too early and it was at this point they noticed what they assumed to be a military ac in its 9 o'clock maintaining FL190. He pointed out to his Planner that they had transferred the ATR72 early and that he might want to coordinate with Warton Radar who he assumed would be working the military traffic. He believed his Planner attempted to telephone Warton just as the military ac appeared to alter track towards the ATR72 whilst rapidly descending to the same level. Although the ATR72 had been provided with a RAS (usual service on ADR W2D) they did not actually stipulate which service the flight would be operating under when it first called on their frequency.

**THE MANCHESTER N LOWER RADAR CONTROLLER** reports he had just decided to split N Sector as there were 3 'low and slow' ac about to call on frequency; a CAT B also operating N of MCT at 4000ft and a full POL bay of fpss. The ATR72 flight called on frequency but only with *"Manchester ATR72 c/s with you"*. He recalled seeing the fps for this ac and found it at the top of the POL bay but a lot earlier than he expected. He replied *"ATR72 c/s roger"* as he was unsure of its position and it was outside his current radar display picture. As he had a few other things to do in progressing the traffic and the split, he decided to get back to the ATR72 flight as soon as the other things had been dealt with. Once done, he wound out his radar display to inform the ATR72 flight that he would be providing a RAS but before he could do this he noticed traffic in its 11 o'clock range 1nm above but in descent heading S. He started to give TI but then noticed the height difference was <1000ft and decreasing so he changed this to full avoiding action to head S. The ATR72 crew reported visual and stated it was a Hawk. The ATR72 climbed to about FL185 from its cruise level of FL170 as TCAS gave them an RA climb. The Hawk descended through the ATR72's level before turning N and climbing back through its level. At this stage he asked the ATR72 crew if everything was OK and they confirmed they were happy to continue enroute and descend to FL170. He explained that the ATR72 was only just within his radar picture when they had checked in and that he had not seen the traffic till late. The crew acknowledged this and he then informed them that they were under a RAS.

**ATSI** reports that the incident took place at 1521UTC, approximately 18NM NW of FIWUD reporting point, within ATS Advisory Route (ADR) W2D, Class F airspace. The C/L of W2D runs between the Isle of Man VOR (IOM) and the Leeds Bradford NDB (LBA), with a 'lateral limit' of 10NM. In the area of concern, W2D extends vertically from FL55 to FL185. The controlling authority for W2D is Manchester ACC.

MATS Part 1, Section 4, Chapter 1, Page 1, Paragraph 1, Provision of Services states *"Class F airspace is designated as advisory airspace; therefore, aircraft operating on ADRs within Radar Advisory Service Areas should, whenever possible, be provided with a Radar Advisory Service or a limited Radar Advisory Service. A Radar Information Service should only be given at the request of the pilot or when no other radar service is available."* The MACC MATS Part 2 Reference MOPS Chapter 5, Paragraph 5.1 states *"For traffic on ADR W2D receiving an Air Traffic Advisory Service, a RAS may be provided. 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."*

MATS Part 1, Section 1, Chapter 5, Page 2, Paragraph 1.4, Radar Advisory Service, is described as *"…an ATS surveillance service in which the controller shall provide advice necessary to maintain prescribed separation between aircraft participating in the advisory service, and in which he shall pass to the pilot the bearing, distance and, if known, level of conflicting non-participating traffic, together with advice on action necessary to resolve the confliction. Where time does not permit this procedure to be adopted, the controller shall pass advice on avoiding action followed by information on the conflicting traffic. Even though the advice is an advisory one, controllers shall pass the 'advice' in the form of instructions." In addition "Controllers shall pass avoiding action instructions to resolve a confliction with non-participating traffic and, wherever possible, shall seek to achieve separation which is not less than 5NM or 3000 feet, except when specified otherwise by the CAA. However, it is recognised that in*

*the event of the sudden appearance of unknown traffic, and when unknown aircraft make unpredictable changes in flight path, is not always possible to achieve these minima"*.

MATS Part 1, Section1, Chapter 5, Page 3, Paragraph 1.5, describes a Radar Information Service (RIS) as *"…an ATS surveillance service in which the controller shall inform the pilot of the bearing, distance and, if known, the level of the conflicting traffic. No avoiding action shall be offered. The pilot is wholly responsible for maintaining separation from other aircraft whether or not the controller has passed traffic information."* Under a RIS, the following relevant conditions apply:

"The service may be requested under any flight rules or meteorological conditions.

The controller shall only update details of conflicting traffic, after the initial warning, at the pilot's request or if the controller considers that the conflicting traffic continues to constitute a definite hazard.

The controller will be advised before a pilot changes level, level band or route.

RIS may be offered when the provision of RAS is impracticable.

*For manoeuvring flights which involve frequent changes of heading or level, RIS may be requested by the pilot or offered by the controller. Information on conflicting traffic shall be passed with reference to cardinal points. The controller will be advised of the level band within which the pilot wishes to operate. The pilot is responsible for selecting the manoeuvring area, but may request the controller's assistance in finding a suitable location. The controller may suggest re-positioning on his own initiative, but the pilot is not bound to comply."*

The ATR72 was en-route IFR at FL170 from Belfast City Airport to Leeds via ADR W2D. At 1515:39, the flight made its first call on the MACC IOM frequency, using only the flight's c/s. The Tactical controller, a trainee with a mentor, responded equally as briefly, with only the flight's c/s and *"roger".* In his written report the mentor recalls having just split the Sector when the flight called. No level of ATS was requested by the flight, nor offered by the controller, the Mentor reporting later that a RAS is the usual service provided on W2D. No exchanges took place until, at 1519:17, the trainee elected to transfer the flight to the next Sector, MACC N Lower Radar. The mentor reports pointing out to the trainee that the transfer was conducted 'too early'. In fact, it occurred about 27nm before the normal transfer point, which is in the vicinity of FIWUD. Reporting later, the mentor believed he shouted a warning about the early transfer to 'N Lower', but was unsure if it was acknowledged. At the same time, what was believed to be a Warton ac (the Hawk) was observed in the vicinity of the ATR72 at FL190 Mode C and it was suggested the IOM Planner telephoned Warton to effect coordination. The radar recording shows this traffic squawking Warton code 3674 and turning R, in the ATR72's 1030 position, range 7·3nm. The Planner did not act immediately as, at this point, he considered the traffic was not currently presenting a risk at 2000ft above and level: however he did so moments later, once this traffic was seen to descend. Before the 'conversation could be completed' the call was discontinued by the Warton controller, who, it is assumed, had recognised that the deteriorating situation demanded his attention.

At 1520, the ATR72 pilot made his first call on the MACC North Lower frequency, simply announcing his presence, adding no further information. The Sector Tactical controller acknowledged the call. In his written report the controller states that he had just decided to split the sector in anticipation of a building traffic situation. He does recall seeing the fps for the ATR72 but was not expecting it quite so early and it was outside the current displayed range of the radar. Other ac had first to be attended to, as well as tasks associated with the 'split', before he adjusted the radar display to capture the ATR72. It had been his intention to firstly advise the pilot that a RAS would be provided, but before doing so noticed traffic (the Hawk) tracking S, currently above, though now descending. As a consequence, at 1520:46, the next transmission to the ATR72 was *"ATR72 c/s there's traffic for you in your er in fact (c/s again) avoiding action turn right now heading south traffic in your eleven o'clock range one mile".* Four seconds later the ATR72 pilot responded with *"…we're climbing traffic in sight we have er er left flank it's a Hawk"*. The controller then informed the ATR72 *"You're right on the edge of my radar* (display*) coverage I wasn't expecting you that early and I didn't see even see him until I went to contact you",* the pilot replying *"Er no worries we have him and we got the TA RA".* Since this incident, MACC have taken steps to remind controllers of the importance of transferring traffic to the next sector at the appropriate position on W2D to ensure the traffic will appear on the receiving sector's radar display. In addition, controllers have been reminded to ensure that pilots are left in no doubt about the level of ATS being provided to traffic in Class F (and G) airspace.

An examination of the encounter on the radar recording, using the 'St. Annes' source, shows that a few seconds before the North Lower controller commenced his transmission to the ATR72, the Hawk's Mode C was indicating FL187, descending. It was now established on a SSE'ly track and in the ATR72's 1030 position at a range of 2·9nm. By the next sweep, at 1520:44, the Hawk is passing FL184 Mode C and has now turned onto S. Four sweeps later (about 16sec), the Hawk's Mode C is indicating FL169, this ac now at 1·5nm from the ATR72 which was still indicating FL170 Mode C. The ATR72 commences a climb, it is assumed in accordance with a TCAS RA. However, the Hawk has also commenced a climb, both ac reaching FL172 when 0·9nm apart at 1521:08. The range between them reduces further to 0·5nm at 1521:16, the CPA, with the Hawk in the ATR72's 1130 position at FL173 Mode C while the latter is now passing FL177 Mode C. By this time, though, respective tracks are just starting to diverge, the ATR72 commencing a turn to the R and the Hawk turning L. Before the turns are fully completed, the two ac remain, briefly, 0·5nm apart, with the ATR72's Mode C at FL181, while the Hawk's is FL174. By 1521:28, divergence is positive with the range now increasing. Both ac continue to climb, reaching co-level, FL186, when 1nm apart. Thereafter, the range between the 2 ac continues to increase, despite a brief reversal of turn by the Hawk, until a point is reached when the ATR72 can safely turn back on track descending to FL170.

The Hawk had departed Warton at 1512 and set course to the NW under a RAS from the Warton Radar controller for general handling within the Warton Radar Advisory Service Area (RASA). The RASA is Class G airspace and extends vertically from FL55 to FL195. The ADR W2D passes through the RASA. During notified hours, Warton Radar normally provides a RAS or a RIS within the RASA, where workload and traffic permit, otherwise a FIS would be offered. The controller, operating on a discrete frequency, later changed the service to a RIS, at the pilot's request, whilst the ac was manoeuvring in an agreed block of airspace FL50 to FL190. At 1518, the Hawk pilot stated *"…in view of the weather the tops about one eight zero any chance going up to two one zero for the next fifteen minutes".* The Radar controller responded with *"…roger er there is traffic* (the ATR72) *west of you by fifteen eastbound on the Advisory at one seven zero you can have up to two one zero can you restrict your base for a short time."* The pilot agreed to the suggestion and the controller replied *"Okay er make it one eight zero and above you can have up to two four zero present position",* which was acknowledged. The controller later reported that he had not received a call from 'MACC' to coordinate the traffic, as he would have expected. However, in taking the steps to restrict the Hawk, he was confident that when the request came, coordination could be agreed without delay. (Note: Co-ordination is not compulsory for either Unit in these circumstances, nor could it be imposed in this airspace where different services and flight rules may exist.) The Warton controller also explained he would not normally need to initiate coordination as Warton pilots prefer to achieve the objectives of their flights unrestricted. He cited occasions when pilots in receipt of a RIS would not agree to a proposed co-ordination, content to maintain their own separation from traffic on the ADR, with the assistance of TI from Warton. That said, both the Warton controller and representatives from MACC agree that overall the two Units work well together in accommodating the needs of each other's traffic by a flexible use of the available airspace in the area.

At 1519, the Hawk was transferred to another frequency, operated by the same APR, due to breakthrough on the first. When established on the new frequency the APR re-emphasised *"…in the block er one eight zero to two four zero",* which was acknowledged. At 1520:22, the Hawk was issued TI on the ATR72 *"…previously mentioned Advisory Route traffic southwest by four miles eastbound one seven zero",* to which a transmitter was switched, in acknowledgement. Further TI was issued, less than a minute later, at 1521:04 *"…previously mentioned traffic's right two o'clock two miles at one seven zero understood not below one eight zero".* Immediately the Hawk pilot responded *"Sorry it's a stall recovery yeah we're tally with him".* Eight seconds later the Hawk pilot reported *"He's actually above us now at one seven five".*

**MOD DE&S** had no comment to make.

## PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

There was no doubt that this had been an easily avoidable occurrence but several minor untidy loose ends had culminated in an Airprox. Looking at the ATC aspects first, the Warton controller was providing the Hawk with a RIS and was thinking ahead of MACC, having 'built in' a 1000ft buffer should coordination have been effected; no coordination was established between the 2 units. Warton had, on 3 occasions, passed timely and accurate TI on the ATR72 to the Hawk crew which was all he was required to do under a RIS; there was no requirement to

separate the subject ac. Unfortunately, at MACC the IOM Radar mentor/trainee team had just spilt the Sector and had not agreed a service with the ATR72 flight when it called on frequency, although a RAS was intended. Furthermore, the mentor had allowed the trainee to transfer the flight to the MACC N Lower Sector far too early, before it had reached FIWUD. ATCO Members wondered why the mentor had not stepped in immediately to correct the trainee's action and stop the transfer taking place. It was also unfortunate that the MACC N Lower Radar controller had delayed establishing an ATS with the ATR72 flight when it checked-in on his frequency. This was understandable given the circumstances – an early call with the ac outside his area when he had other tasks to complete to split the sector - but which led to a break in ATS being provided. Although at the time the IOM team transferred the ATR to N Lower the radar shows the Hawk was not in conflict with the ATR72 - separation of 7·3nm and 2000ft and routeing away - the situation changed very quickly when the Hawk turned R towards the ATR72's projected track. This led Members to agree that had the ATR72 still been on the IOM Sector frequency, action could have been taken to resolve the confliction tactically and that the early transfer of the ATR72 to the next sector had contributed to the Airprox. The IOM Planner had attempted to coordinate the ATR when the Hawk turned and descended into conflict but the telephone call was terminated early by the Warton APR so coordination was not effected. Indeed, Members opined that had coordination taken place it would probably have not been different from the 'level restriction' put in place on the Hawk by the Warton APR.

Moving on to the flight operational aspects, pilot Members opined that because of the sortie profile of the Hawk, the crew would have been better served had they, as part of their HASELL checks prior to stalling, paid more regard to the ATR and manoeuvred away from its projected track prior to commencing. Accepting a restricted base level to maintain vertical separation above the ATR72 had left the Hawk crew only a narrow height band within which a recovery had to be effected with no margin for error. However, during the recovery the Hawk crew descended through their agreed level and into conflict with the ATR72 and this had caused the Airprox.

Turning to risk, the MACC N Lower Radar controller had very quickly given the ATR72 flight an avoiding action R turn away from the Hawk when he noticed the confliction. The ATR72 crew had been given the 'heads up' of the deteriorating situation by a TCAS TA and had monitored the Hawk's approach. When TCAS gave an RA 'climb' they followed the guidance and visually acquired the Hawk to their L whilst simultaneously turning R in compliance with the ATC avoiding action. Meanwhile the Hawk crew had seen the ATR72 during their stall and had recovered by descending and visually manoeuvring to the L before climbing. However, this climb had strengthened the RA 'climb' on the ATR's flightdeck resulting in an increased demand to 4000fpm ROC. The ATR crew increased their AoB and saw the Hawk turning L away. Taking all of these elements into consideration, the visual sightings and actions taken by both crews were enough to allow the Board to conclude that any risk of collision had been quickly and effectively removed.

## PART C: ASSESSMENT OF CAUSE AND RISK

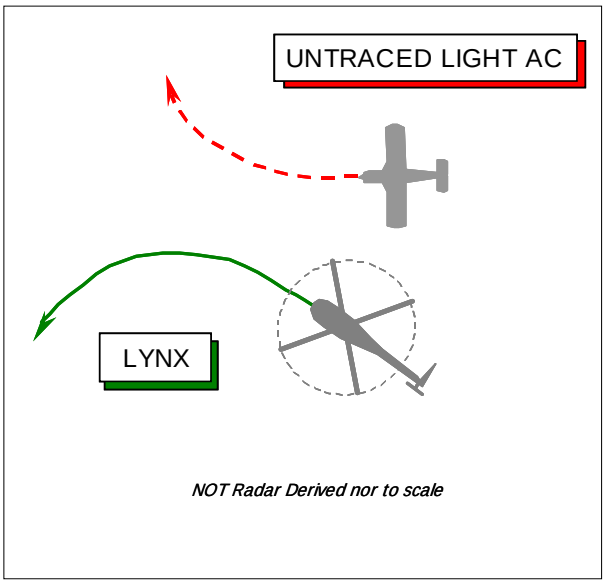
Cause: The Hawk crew descended through their agreed level and into conflict with the ATR72.

Degree of Risk: C.

Contributory Factors: The early transfer of the ATR72 to the next sector.

## AIRPROX REPORT NO 076/08

| | | |
|---|---|---|
| *Date/Time:* | 4 Jun 1258 | |
| *Position:* | 5055N 00138W (1nm ENE of Stoney Cross) | |
| *Airspace:* | FIR/LFA1A | (Class: G) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | Lynx Mk8 | Untraced LA |
| *Operator:* | CoS AVN | N/K |
| *Alt/FL:* | 1500ft RPS | N/K |
| *Weather* | VMC SKC | NK N/K |
| *Visibility:* | 30km | N/K |
| *Reported Separation:* | 100ft V/30m H | N/K |
| *Recorded Separation:* | Not recorded | |




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

**THE WESTLAND LYNK MK8 HELICOPTER PILOT** reports that he was transiting under VFR from the Isle of Wight (Cowes) past Stoney Cross to Middle Wallop in VMC – his helicopter was crewed with a single pilot and two navigators. Established in a level cruise at an altitude of 1500ft PORTLAND RPS in a clear sky with an in-flight visibility of 30km, they had called Southampton for a FIS but the controller advised them to call Bournemouth ATC. RT contact was then made with Bournemouth on 119·475MHz who instructed them to "standby". Whilst waiting for a reply, passing abeam Stoney Cross VRP heading 304° at 120kt, he spotted a conflicting ac in their 3 o'clock some 200ft away at a similar altitude. To avoid the other ac – a high wing single engine tractor monoplane - he immediately entered a descending L turn. Simultaneously, as he executed his avoiding action, the pilot of the other ac took avoiding action by making a level R turn and passed about 30m away some 100ft above his helicopter with a *"high"* risk of collision.

He added that their workload was *"low"* and as they were just entering LFA1A, they elected to call Salisbury Ops.

UKAB Note (1): The RAC expended considerable effort whilst endeavouring to identify the aeroplane reported by the Lynx helicopter pilot. A careful review of the radar recordings available to LATCC (Mil) did not illustrate the encounter at all. Although several light ac (LA) were identified routeing through the area, procedural tracing action and subsequent contact with the pilots ruled out each one. Thus all avenues of enquiry ultimately proved fruitless. Consequently, despite exhaustive and protracted investigative effort, the identity of the aeroplane reported by the Lynx pilot remains unknown.

UKAB Note (2): This Airprox occurred outwith the coverage of recorded radar.

**ATSI** had nothing to add.

**HQ NAVY COMMAND** had nothing to add.

### PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included a report solely from the pilot of the Lynx helicopter, transcripts of the relevant RT frequencies, radar video recordings and a comment from the appropriate operating authority.

It was evident that despite the best endeavours of all concerned the reported ac could not be identified. Therefore, without the other pilot's perspective it was difficult for the Board to come to meaningful conclusions as to Cause and Risk. Furthermore the absence of any radar data prevented further analysis of the geometry and separation

from an independent viewpoint. However, there was no reason to doubt the veracity of the Lynx pilot's report. From his perspective, he had only spotted the conflicting LA some 200ft away, at a similar altitude converging from his 3 o'clock. Whilst operating VFR in a clear sky in the 'see and avoid' environment of Class G airspace, at this reported geometry with the untraced light ac converging from the helicopter's starboard side, under the 'Rules of the Air' the Lynx crew were responsible for sighting and avoiding the light ac. However, 'the Rules' can only work if the other ac is sighted in good time to take appropriate action. Here at a range of 200ft the Lynx pilot spotted the other ac at a late stage but still managed to take robust avoiding action. At this range, if the helicopter was plainly visible to him it should have been apparent to the LA pilot also that his aeroplane had not previously been spotted by the Lynx crew but it seems his avoiding action was taken at the same time. These fortunately complementary manoeuvres, according to the Lynx pilot's account, probably averted an actual collision. Therefore, on the limited information available the Board could only conclude that this Airprox had resulted from a late sighting by the Lynx crew and, probably, a late sighting by the pilot of the untraced light ac.

A controller Member pointed out that the likelihood of encountering civilian LA in the vicinity of promulgated VRPs was probably a little higher than that at other locations in the 'Open FIR' - a point which was worth remembering at the flight planning stage and when approaching such locations. Regarding the inherent risk, without recorded radar data it was not feasible to determine with absolute certainty the separation that pertained here. However, it would seem that both pilots had spotted each other's ac in sufficient time to effect avoiding action, passing 30m and some 100ft apart at the closest point with a *"high"* risk of collision in the Lynx pilot's view. These distances coupled with the late sighting was enough to convince the Board that safety was not assured in the circumstances conscientiously reported here.

## PART C: ASSESSMENT OF CAUSE AND RISK

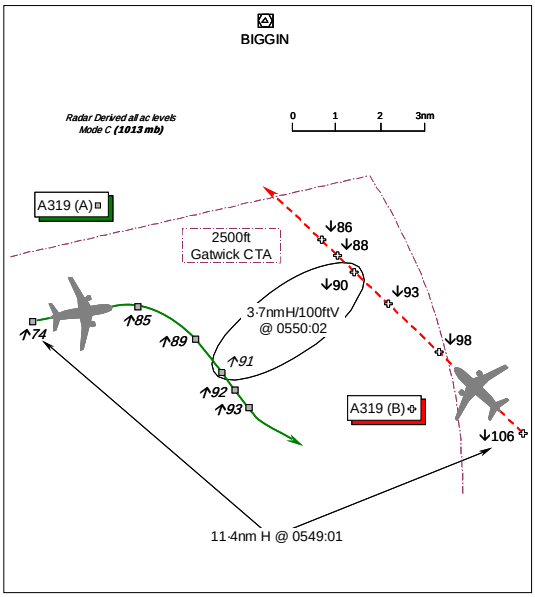
Cause: A late sighting by the Lynx crew and a probable late sighting by the pilot of the untraced light ac.

Degree of Risk: B.

## AIRPROX REPORT No 077/08

## AIRPROX REPORT NO 077/08

| | | |
|---|---|---|
| *Date/Time:* | 6 Jun 0550 | |
| *Position:* | 5113N 00003E (7nm S of BIGGIN) | |
| *Airspace:* | London TMA | (Class: A) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | A319 | A319 |
| *Operator:* | CAT | CAT |
| *Alt/FL:* | ↑FL100 | ↓FL80 |
| *Weather* | VMC | NR |
| *Visibility:* | NR | NR |
| *Reported Separation:* | | |
| | Nil V/3nm | NR |
| *Recorded Separation:* | | |
| | 100ft V/3·7nm H | |




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

**THE PILOT OF AIRBUS A319 (A)** reports that he was departing from London Gatwick bound for Sofia on a DVR 8M SID and contacted London CONTROL [LTC] on 120·525MHz. Whilst in receipt of a RCS, he was eventually instructed to head 080° and climb to FL100. About 30nm W of DVR, during the climb through FL90 at 250kt, traffic was spotted on TCAS some 4000ft above them in their 1 o'clock - 15nm away and descending. Assuming that the other ac would descend to and maintain FL110, he reduced his ac's ROC to avoid a TCAS RA. However, the other ac – that had been spotted visually - kept descending. ATC issued an avoiding action R turn onto a heading of 145° and the controller requested the best rate of turn. Only a TA was received, an RA was not enunciated by TCAS. The other ac descended through their level as it passed 3nm to port at the point of minimum separation with a *"medium"* risk of collision.

**THE PILOT OF AIRBUS A319 (B)** could not recall anything unusual about the flight.

**THE LTC BIGGIN SECTOR CONTROLLER (BIG SC)** reports candidly that because of an error he had to issue avoiding action to the crew of A319 (A) that was S of BIG VOR, against A319 (B). There was no loss of prescribed separation but he could not recall if STCA was activated [it was not]. No comment was made on the RT by either crew and he reported the occurrence to his Group Supervisor.

**ATSI** reports that A319 (B), which was inbound to Heathrow from Basle, established communication with the TC BIGGIN Sector at 0542, descending to FL150 on a radar heading of 315°. The flight was instructed to maintain FL150 on reaching and the pilot was advised not to expect a hold at BIGGIN. Approximately 3min later, A319 (B) was instructed to descend to FL80, to be level by BIGGIN, which the pilot read back correctly. The ac was about 28nm SE of BIGGIN at the time. Shortly afterwards, A319 (A) contacted the Sector after departure from RW26L at Gatwick on a DOVER 8M SID; the crew was instructed to climb to 5000ft.

At 0547:43, A319 (A) was instructed to continue on its present heading and climb to FL100. The radar recording shows the two ac 22·6nm apart; A319 (A) is passing 4600ft, heading 082°, and A319 (B) is descending through FL129, still on its radar heading of 315°, routeing slightly L of a direct track to BIGGIN. The BIG SC believed that A319 (A) would climb above A319 (B) before horizontal separation was lost. However, at 0549:03, the SC, realising that this was not assured, instructed A319 (A) *"I'm sorry can you make a right turn now heading 1-4-5 degrees"*. Once the pilot read back the heading change, the SC continued *"That's correct sir that is av- avoiding action please can you make it a hard hardest turn as you can please"*. No traffic information was passed. The radar photograph, timed at 0549:01, shows the two ac, on conflicting tracks, 11·4nm apart. A319 (A) is passing FL74 and A319 (B) FL106. The BIG SC believed, incorrectly, that he had transferred A319 (B) to Heathrow so he then telephoned the Heathrow INT S DIR, requesting A319 (B) to be turned N. The RT transcript reveals that the

INT S DIR did call A319 (B) but received no response. A further transmission was made by INT S DIR to A319 (B) *"..if you're with me turn right heading 3-6-0"*.

The crew of A319 (A) quickly made the avoiding action turn and separation was maintained as the levels of the subject ac crossed. The CPA – 3·7nm/100ft - occurred at 0550:02, after the ac had passed each other. The pilot of A319 (B) made no transmissions on the frequency until after the event when he asked whether he should continue on the radar heading.

The BIG SC instructed A319 (A) to climb into confliction with A319 (B). However, realising that his plan was not working, he issued an avoiding action turn to the crew of the outbound A319 (A), which ensured that the prescribed horizontal separation of not less than 3nm was maintained between the two ac. A319 (B) did not receive any remedial action instructions from the BIG SC, because he believed, erroneously, that he had already transferred the flight to Heathrow INT S DIR.

## PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included a report from the pilot of A319 (A) and brief comment from the pilot of A319 (B), a transcript of the relevant RT frequency, radar video recordings, together with reports from the air traffic controller involved and a report from the appropriate ATC authority.

From the comprehensive ATSI report and the BIG SC's laudably frank account, it was evident to the Members that the controller's appreciation of the geometry of the situation was unsound when he instructed the crew of A319 (A) to climb to FL100 as this had resulted in a confliction with A319 (B) that was descending to FL80. Whilst at the time it might have seemed to the SC that the 'cross-over' could be achieved before the two ac flew into close quarters horizontally, this was not the case and it was clear that further corrective action was warranted. When this became apparent to him, the BIG SC issued an appropriate avoiding action turn to the crew of the outbound A319 (A) which, as it was complied with promptly, successfully resolved the conflict. In the Board's view, this Airprox had resulted because the BIGGIN SC climbed A319 (A) to a level which resulted in a conflict with A319 (B) which was subsequently resolved by prompt compliance with the controller's avoiding action turn instruction.

Regarding the degree of Risk, whilst some might consider the resultant situation less than ideal, the horizontal radar separation prescribed for use in this airspace of not less than 3nm was not breached. The crew of A319 (A)'s compliance with the avoiding action turn helped in this respect. Controller Members emphasised that this was a prime example of a situation which demanded prompt compliance with the controllers instruction – the salutary lesson here for pilots being to react without delay to what you are told – which saved the day here. Once the avoiding action turn took effect, TCAS recognised that the safety factors would be maintained and so this highly efficient safety net was not called upon to act in this benign situation - hence only the TA. Taking all these factors into account, coupled with the crew of A319 (A)'s visual sighting of the other ac, the Board concluded unanimously that no risk of a collision had existed in these circumstances.

## PART C: ASSESSMENT OF CAUSE AND RISK

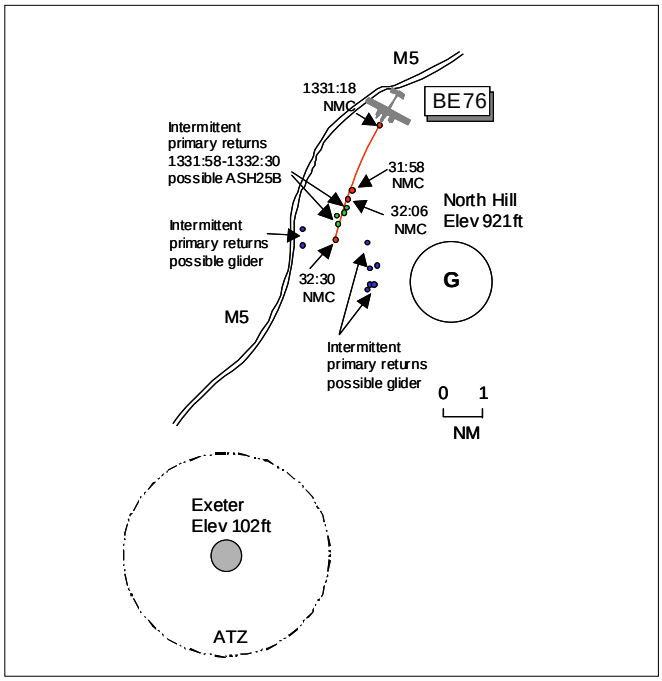
Cause: The BIGGIN SC climbed A319 (A) to a level which resulted in a conflict with A319 (B), which was subsequently resolved by prompt compliance with the controller's avoiding action turn instruction.

Degree of Risk: C.

## AIRPROX REPORT No 078/08

## AIRPROX REPORT NO 078/08

| | | |
|---|---|---|
| *Date/Time:* | 7 Jun 1332 (Saturday) | |
| *Position:* | 5053N 00322W (3nm WNW North Hill G/S - elev 921ft) | |
| *Airspace:* | FIR | (Class: G) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | ASH25B | BE76 |
| *Operator:* | Civ Pte | Civ Club |
| *Alt/FL:* | 2700ft (amsl) | 3200ft↓ (QNH 1020mb) |
| *Weather* | VMC CLBC | VMC CLBC |
| *Visibility:* | 20nm | >10km |
| *Reported Separation:* | 150ft V/200m H | 300ft V |
| *Recorded Separation:* | <0·2nm H | |




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

**THE ASH25B PILOT** reports flying a local sortie from North Hill and in communication with North Hill and other gliders on 130·1MHz. The visibility was 20nm flying 2000ft below cloud in VMC and the ac was coloured white. About 2·5nm WNW of North Hill after straightening out heading 280° at 60kt and 2700ft amsl, after a 500ft thermal climb, he heard the noise of engines very close. He looked up and slightly behind in his 8 o'clock he saw a twin-engine ac about 200m away flying in a S'ly direction about 150-200ft higher than his sailplane and possibly descending. Neither he nor the P2 saw it before the Airprox and he assessed the risk as high. He commented that his glider had a 27·5m wingspan and hoped that the BE76 pilot saw them. He also commented that there were 10 other gliders in the area at the time.

**THE BE76 PILOT** reports flying solo on a local VFR sortie from Exeter and in receipt of a FIS from Exeter Radar on 128·975MHz squawking with Mode C. The visibility was >10km flying 1000ft below cloud in VMC and the ac was coloured white/brown; no lighting was mentioned. He had earlier departed to the NW but was returning to Exeter tracking down the M5 motorway. About 7nm N of Exeter heading 180° at 140kt as he started his descent from 3200ft, he first noticed a glider 100m off his port wing before it passed underneath by about 300ft with no horizontal separation. No avoiding action was taken as he did not assess any significant risk. He assumed the glider was not fitted with a transponder as he did not receive any TCAS indications and he also did not hear any radio calls from its pilot so assumed the glider pilot was not talking to Exeter Radar.

**THE EXETER APR** reports the BE76 had departed to the NW on a local flight and in receipt of a FIS. The flight returned from the Tiverton area about 30min later and was instructed to join on a R base leg for RW26. After the flight was transferred to Tower frequency, a glider pilot called to report an Airprox 4nm W of North Hill at 'Level 27 above sea level' which he understood to be altitude 2700ft and reporting the miss distance as 200ft. He did not recall seeing a radar return in the reported area apart from that believed to have been the returning BE76.

**ATSI** comments that the incident took place in Class G airspace, approximately 7nm N of Exeter Airport. The BE76 departed at 1308 from Exeter's RW26, under VFR, on a local flight to the NW. North Hill Gliding site is situated approximately 9nm to the NE of Exeter. The Exeter MATS Part 2, Section 1-39, states *'North Hill usually inform Exeter ATC when gliding takes place. A flight progress strip showing details of gliding activity at North Hill should be positioned in front of the radar north ATCO as an aide memoir'*. It has neither been established if North Hill called nor whether an fps was in place at the time. At 1310, the BE76 pilot established communications with the Exeter APR, reporting climbing to 3000ft VFR to the NNW. The controller responded by advising the flight that

a FIS was now being provided. No SSR code was allocated. (Note: VFR local traffic is normally only provided with a FIS, unless otherwise requested by the pilot, in which case the provision of a radar service may be agreed, subject to workload and radar coverage).

The MATS Part1, Section 1, Chapter 1, Page 2, Paragraph 6, Flight Information Service states *"A FIS is a service provided without the use of ATS surveillance systems, either separately or in conjunction with other services, for the purposes of supplying information useful for the safe and efficient conduct of flights. Under a FIS the following conditions apply:*

*Provision of the service includes information about weather, changes of serviceability of facilities, conditions at aerodromes and any other information pertinent to safety;*

*A controller may attempt to identify a flight for monitoring and co-ordination purposes only. Such identification does not imply that an ATS surveillance service is being provided or that the controller will continuously monitor the flight. Pilots must be left in no doubt that they are not receiving such a service;*

*Controllers are not responsible for separating or sequencing aircraft.*

*In addition to the above, controllers will, subject to workload, provide pilots with information concerning collision hazards to aircraft operating in Class C, D, E, F or G airspace when self evident information from any source indicates that a risk of collision may exist. It is accepted that this information may be incomplete and the controller cannot assume responsibility for its issuance at all times or for its accuracy."*

About 20min later, the pilot of the BE76 reported *"…eleven miles to the north of the field three thousand feet with the field in sight request joining instructions with information Charlie."* The APR replied *"…roger runway two six QFE one zero one seven"* which was read back. Thirty seconds later, the controller instructed the flight to join RH base-leg for RW26 and again this was read back. At 1332:30, the pilot advised the controller *"…for your information North Hill is very active this afternoon"* which was acknowledged. This information was subsequently issued to a departure, as generic TI. At 1334, the BE76 flight was transferred to Exeter Tower.

About 1min later, the ASH25B pilot called on the Exeter Approach frequency to *"…file an Airprox approximately four minutes erm ago with your Beech."* The APR then requested more details, the pilot responding with *"We were level two seven above sea level approximately four miles west of North Hill gliding field and the Beech crossed on top of us of by two hundred feet heading south...".*

The APR had discharged his responsibilities to the BE76 in respect of a FIS. The pilot had indicated he was operating to the NNW, which is not in the vicinity of North Hill. It is concluded that there are no implications for ATC in this incident.

UKAB Note (1): The Burrington radar recording at 1331:18 shows a 7000 squawk with NMC, believed to be the BE76, 4·2nm NNW of North Hill Gliding Site tracking 190° approaching Exeter from the NNE with several intermittent primary returns, believed to gliders, seen manoeuvring ahead between 2-4nm W and NW of North Hill. Between 1331:58 and 1332:30 when the BE76 passes 3nm WNW abeam North Hill Glider Site it passes within 0·2nm of an intermittent radar return, which is possibly the ASH25B. This return does appear to manoeuvre in a L turn, moving from BE76's 12 o'clock out to its 1 o'clock then back towards its 1230 position before fading and then reappearing in its 6 o'clock. However, this movement may be down to track jitter so the CPA given is the best estimate of the minimum separation from the radar data available.

## PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It was clear that this was an encounter in Class G where pilots discharge their responsibilities for maintaining their own separation from other ac through see and avoid. Despite good VMC the ASH25B pilot had not seen the approaching BE76, only hearing it as it passed close by before visually acquiring it in his 8 o'clock, 150ft above and 200m away to his L whilst descending and diverging which Members agreed had been an effective non-sighting. Similarly, although the opportunity was there to see the glider earlier, the BE76 pilot only saw the

## AIRPROX REPORT No 078/08

ASH25B late as it appeared from his L about 100m away before it passed 300ft below. The BE76 pilot was in receipt of a FIS from Exeter, having departed earlier to the NW, and had called just before the Airprox requesting joining instructions. The pilot had then made comment on the frequency about the North Hill gliding activity which the controller had noted. These sighting issues combined with the geometry and separation distances that pertained as the ac crossed were enough to persuade the Board that safety had not been assured during the encounter.

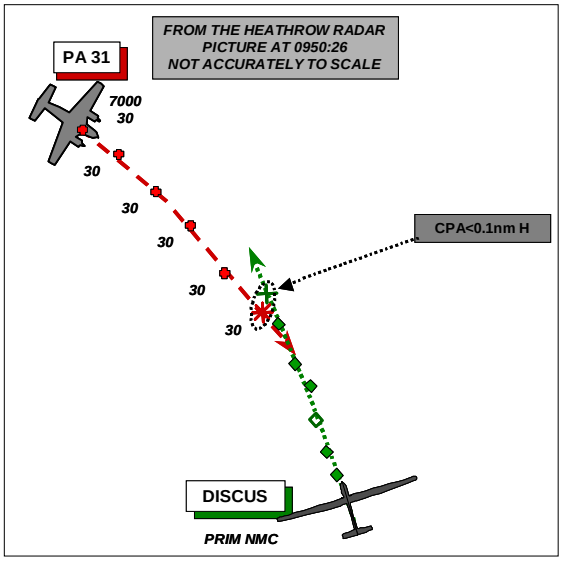
### PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Effective non-sighting by the ASH25B pilot and a late sighting by the BE76 pilot.

Degree of Risk: B.

# AIRPROX REPORT NO 079/08

| | | |
|---|---|---|
| *Date/Time:* | 5 Jun 0950 | |
| *Position:* | 5125N 00105W | (6nm W READING) |
| *Airspace:* | London FIR | (Class: G) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | Duo-Discus Glider | PA31 |
| *Operator:* | Civ Pte | Civ Pte |
| *Alt/FL:* | 3000 ft | 3000/4000 ft |
| | (1017 mb) | (QNH 1017 mb) |
| *Weather* | VMC NR | VMC HAZE |
| *Visibility:* | >10 Km | 10 km |
| *Reported Separation:* | | |
| | 30ft V/200yd H | 20 ft V / 500m H |
| *Recorded Separation:* | | |
| | Nr v <0.1nm H | |




## PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

**THE DUO- DISCUS PILOT** reports flying a cross-country soaring flight in a white glider. He was not in receipt of an ATS and no transponder is fitted. He was heading N at 60kt between thermal climbs when he sighted a white, twin engined ac about 300yd away in his 1130 position at the same level. After a slight hesitation to ensure it was not about to turn, he turned his glider to the right and descended slightly. The other ac appeared not to deviate but it had passed out of his view by then. He made an immediate call to Farnborough LARS to report an 'Airmiss' and the other pilot then called LARS making initial contact with them. He reported his workload as being high at the time of the incident. The pilot of the twin did not wish to report the incident as, in his opinion, both pilots had taken successful avoiding action and there was no 'Airmiss'. The glider pilot did not assess the risk but considered that his turn had prevented a collision.

**THE PA31 PILOT** reports flying a private flight to Shoreham in a white and green ac with strobes selected on; the transponder was set to 7000 with Modes C and S on. At the time of the incident Brize Radar had released him as he approached Compton VOR and was making contact with Farnborough LARS. He immediately tuned to the Farnborough frequency but was unable to make his initial call due to high RT traffic with several callers being told to standby. Having made the turn at Compton, he routed direct to Shoreham heading 140° at 160kt. He considered the weather/visibility to be good and he was not concerned that he would not be able to see the other ac.

A few miles SE of CPT he saw a glider swoop across in front of him about 500m away and he estimated that it was tracking N as it moved from right to left in front of him while descending. After it went across his track it made a left turn and they passed flying parallel, the glider being quite well below his ac. At the time he considered that the glider was closer to him than he would normally expect, however at no time did he consider that there was any risk of collision or that the safety of either ac had been compromised. He is aware that gliders are used to flying close to other ac and he assumed the glider pilot was just being a bit "gung ho" as, in his experience, they sometimes are.

After a couple of minutes he heard an ac call Farnborough to report an 'Airmiss' and it became apparent that the caller was referring to this incident. He then called Farnborough and explained that he thought his ac was the other ac being referred to. On his return to Leeds later that day he telephoned Farnborough to pass on his contact details.

The Farnborough METARs were:

EGLF 050920Z VRB04KT 9999 FEW038 17/09 Q1017=

## AIRPROX REPORT No 079/08

EGLF 050950Z 18005KT 120V230 9999 SCT040 17/10 Q1016=

UKAB Note (1): Both the Heathrow 10cm and 23 cm radars show the event and, although on both there is considerable jitter on the glider's primary only return, at the CPA both returns show clearly and the respective tracks/positions correspond closely with the pilots' reports.

### PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board noted that the incident had taken place in Class G airspace where both pilots had an equal and shared responsibility to see and avoid other ac in accordance with the Rules of the Air. Although the glider had right of way, for safety to be assured the PA31 pilot needs to see it and recognise that it was a glider in sufficient time to avoid it: in this incident he did not.

Members noted that at the time of the incident the visibility had been poor, the PA31 had been flying into sun, with the glider effectively head-on and that both ac were predominantly white in colour against a background of light cloud. These factors, when combined, would have made both ac difficult to acquire visually from the respective cockpits. In addition, both pilots reported that their workload had been high and therefore they may not have been fully engaged in looking out for other ac.

Due to the proximity of the ac and the apparent intensity of the avoidance performed by the glider, Members agreed that safety had not been assured.

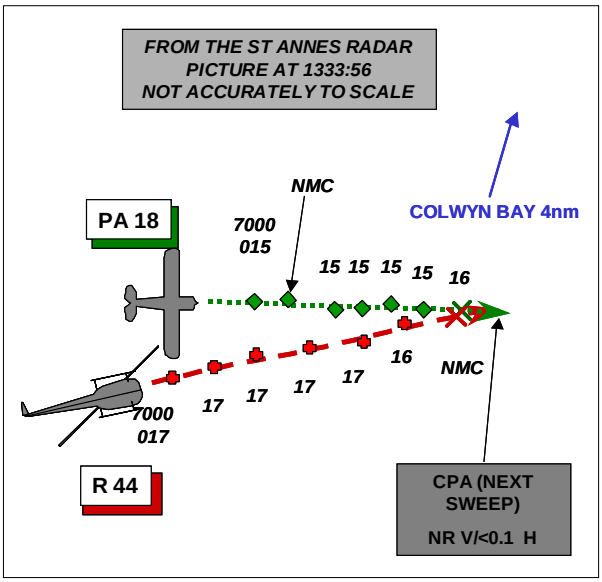
### PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Late sightings by both pilots.

Degree of Risk: B.

# AIRPROX REPORT NO 080/08

| | | |
|---|---|---|
| *Date/Time:* | 8 Jun 1335 (Sunday) | |
| *Position:* | 5315N 00342W (2nm S of Old Colwyn) | |
| *Airspace:* | Lon FIR | (Class: G) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | PA18 | R44 |
| *Operator:* | Civ Pte | Civ Pte |
| *Alt/FL:* | 2000ft (QNH 1028) | 2000ft (N/K) |
| *Weather* | VMC CAVOK | VMC NR |
| *Visibility:* | 50nm | 10km |
| *Reported Separation:* | 50ft V/100m H | 100ft V/150m H |
| *Recorded Separation:* | NR V /<0.1nm H | |




## PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

**THE PA18 PILOT** reports flying a private VFR flight from Caernarfon to a private strip in N Wales squawking with Mode C. While he was in the cruise, heading 090° at 65kt, a black R44 appeared to his starboard side in a steep right hand diving turn. The R44 had approached his ac from behind and all he saw was the R44 banking and diving away. As there was no cloud he was able to observe the R44 track to West Kirby and he then heard the pilot call Liverpool APP on 119.85 requesting a visual join. Since he saw the ac as it passed he took no avoiding action but assessed the risk as being very high.

**THE R44 PILOT** reports flying a VFR flight from Caernarfon to Liverpool with strobes selected on squawking 7000 with Mode C and listening out with Liverpool APR. While heading 090° at 100kt and descending from 3000ft to 2000ft he saw a PA18 300m ahead at 2000ft. He had been map reading at the time but took avoidance by turning right and continuing his descent. He was visual throughout and passed 100m to the right of the PA18, assessing the risk as being medium.

UKAB Note (1): The recording of the St Annes radar shows the incident clearly. Both ac are squawking 7000 with Mode C and both are initially tracking about 085°. Initially the PA18 indicates level at FL015 and the R44 level at FL017. The R44 turns slightly to the left at 1333:20 and commences a slow descent 20 sec later. The contacts merge at 1333:57 with the R44 indicating FL 016 but the Mode C of the PA18 has dropped out, reappearing 2 sweeps later at FL 015.

## PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board noted that since the R44 was overtaking the PA18, under Rules of the Air, Rule 11, its pilot should have given way to the latter ac. This however, depends on the overtaking pilot seeing the other ac in sufficient time to avoid it by a reasonable margin. In this incident it would seem, based on the R44 pilot's report, that he had not seen the PA18 until fairly late, resulting in him avoiding it by a smaller margin than ideal. Since the PA18 had initially been below the R44 and to its left, a helicopter pilot Member familiar with R44s suggested that the PA18 might have been obscured to the pilot of the descending R44 by the ac's cabin framework and floor. However, the radar recording showed that the R44 pilot had levelled at least 30sec before the CPA and therefore had ample opportunity after levelling to acquire and avoid the PA18. Members opined that the R44 pilot might have been preoccupied with map reading or reselecting his radio and the Board also noted that the PA18 presented a very small non-moving target with a tail-on aspect.

Since the helicopter pilot had not seen the PA18 until too late to take reasonable avoidance, even at such a slow overtaking speed, Members considered that, although there had been no risk of a collision since the R44 pilot was eventually visual with the Piper, safety had not been assured.

The Board commended both pilots for using SSR and Mode C.

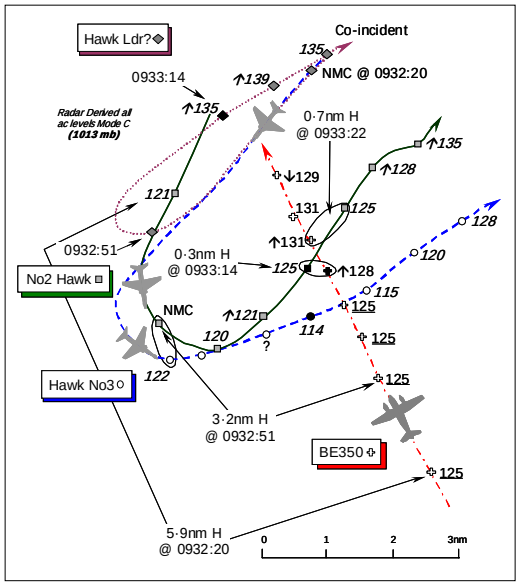
## PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A late sighting by the R44 pilot.

Degree of Risk: B.

# AIRPROX REPORT NO 081/08

| | | |
|---|---|---|
| *Date/Time:* | 10 Jun 0933 | |
| *Position:* | 5421N 00058W (18½nm SE of Durham Tees Valley Airport) | |
| *Airspace:* | Vale of York AIAA | (Class: G |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | Hawk T1A | BE350 King Air |
| *Operator:* | HQ Air (Trg) | Civ Trg |
| *Alt/FL:* | 13000ft↑ RPS (1019mb) | FL125 |
| *Weather* | VMC CAVOK | VMC CLOC |
| *Visibility:* | >10km | 40nm+ |
| *Reported Separation:* | 500ft V/¼nm H | 200-300ft V/200m H |
| *Recorded Separation:* | 300ft V/<0·3nm H | |




## PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

**THE HAWK T1A PILOT** reports that he was flying as the No2 of a 3-ship Hawk formation conducting an air combat training (ACT) sortie in Class G airspace on a discreet UHF frequency. Flying under VFR in CAVOK weather they were operating autonomously, and thus not in receipt of an ATS, squawking A7000 with Mode C. Neither Mode S, TCAS nor any other form of CWS is fitted.

After completing a 180° climbing LH turn to reposition the formation in between practise engagements, climbing through 13000ft RPS (1019mb) the No3 Hawk pilot called on RT to him – the No2 - to 'bunt'. At this point, heading 070°(M) at 300kt, he "gained tally" and spotted a twin turboprop ac with a high T tail – possibly a King Air - approaching on a collision course about ½nm away in his 2:30 position - slightly high. *"There was a real risk of collision,* so to avoid the other ac – the Beech 350 King Air - he bunted his ac, which resulted in the twin passing 500ft above and about ¼nm astern of his Hawk with a *"high"* risk of a collision.

His ac has a black colour scheme and the white HISLs were on.

**THE BEECH 350 KING AIR PILOT (BE350)** reports that they were in transit from Cranwell to Leuchars under IFR, in VMC cruising straight & level at FL125, clear of cloud with an in-flight visibility of 40nm+. Durham Tees Valley ATC was providing a RIS on 118·85MHz. Mode S with the assigned code was selected on with TCAS. The ac was crewed with two pilots on this flight; a civilian instructor Pilot-in-Command and a qualified military pilot conducting type training who was the PF.

Approaching a position 10nm W of Fylingdales heading 340°(M) at 270kt, Durham APPROACH passed traffic information about conflicting traffic. One Hawk jet was visually acquired initially then all three Black Hawks of the formation were spotted 6nm away in their 1 o'clock tracking W, flying about 1000ft below their cruising level in trail.

Maintaining heading and level at FL125 they monitored the 3 jets progress. The nearest Hawk – believed to be the No2 - commenced a climbing L turn which placed the jet in their 10 o'clock as it then continued to track E across their path climbing towards their level. The co-pilot, who was the PF, anticipated both the TCAS RA and expected flight path of the Hawk. Therefore they effected avoiding action - although the Hawk should have done so [under the Rules of the Air] - as his King Air was in the Hawk pilot's right arc of view. TCAS had enunciated a CLIMB RA, which was complied with, as the Hawk passed 200-300ft below and 200m away whilst crossing ahead from L – R with a *"high"* risk of a collision. ATC was advised of the TCAS climb.

**THE DURHAM TEES VALLEY AIRPORT APPROACH RADAR CONTROLLER (DTVA APR)** did not provide a report.

## AIRPROX REPORT No 081/08

**ATSI** reports with RT transcript that the BE350 crew made their initial call to the DTVA APR at 0932, reporting at FL125 proceeding direct to the NT. The DTVA APR informed the BE350 pilot that he was identified and was being provided with a RIS. In the same message, he informed the pilot of *"three contacts in your 12 o'clock range of 4 miles indicating the lowest is One F-Flight Level 1-2-0 the highest is Flight Level 1-3-0"*. The pilot replied *"roger we have all 3 traffic both TCAS* [&] *visual"*. Descent to 5000ft, at the pilot's discretion, was issued by the APR shortly afterwards. Before the pilot could reply the controller updated the traffic information *"Previous mentioned traffic heading straight towards your left a range of 1 mile"*. Whereupon the BE350 pilot responded *"Got him visual just coming under the left wing now"*. [UKAB Note: A later unintelligible transmission from the BE350 crew crossed with another flight, but might well have been the BE350 crew reporting their TCAS CLIMB. After the event, the pilot of the BE350 reported at 0933:30 *"…TCAS CLIMB resuming Flight Level 1-2-5".* The APR then added in reply *"[C/S] roger that's understood er all traffics they are now eastbound er to the East of you".*

The DTVA APR Controller complied with the procedures detailed in the MATS Part 1, Section 1, Chapter 5, for providing a RIS.

UKAB Note (1): This Airprox is illustrated relatively clearly by the LATCC (Mil) Great Dun Fell Radar recording, which shows the BE350 flown by the reported pilot approaching the location of the Airprox some 18½ nm SE of DTVA heading NNW, level at FL125. The Hawk formation is shown SW bound before turning about NE'ly to re-position; the No2 flown by the reporting pilot is shown indicating FL121 at 0932:20, some 5·9nm NNW of the BE350. The Formation turned about with the No2, believed to be in the centre of the formation at a range of 3·2nm from the Twin and inside the other No3 Hawk – with the ac presumed to be the lead ac remaining to the NW. Rolling out NE'ly – the No2 climbing through FL121 - the No3's radar return is momentarily lost for one sweep. The minimum recorded horizontal separation of 0·3nm (about 600yd) occurs at 0933:14, with the No2 Hawk having climbed to FL125, some 300ft below the BE350, which is shown in the climb through FL128 in response to the reported TCAS CLIMB RA. At this point the No3 is shown having descended to FL114 in the BE350's 8 o'clock at a range of 0·7nm, with the lead jet crossing through the BE350s 12 o'clock from L – R - some 2·7nm away - indicating FL135. The CPA occurred with the No2 Hawk, in between sweeps, as the jet crosses ahead of the BE350 into the latter's 2:30 position - 0·7nm away still indicating FL125, whilst the twin ascends to a maximum indicated level of FL131, with the other 2 Hawks setting a broadly parallel course in line abreast. The BE350 then descends back towards its cruising level as the formation clears to the E.

**HQ AIR (TRG)** comments that as the Hawk formation turned about to reposition the BE350 was not seen by the No2 Hawk pilot until they were ½nm apart. Although the No2 Hawk bunted the PF of the BE350 was aware, both visually and on TCAS, of the rapidly developing situation and had already taken 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 HQ Air (Trg) Member observed that the leader of the Hawk formation had advised that prior to this flight he had endeavoured to secure the provision of a radar service from LATCC (Mil) during the execution of their ACT sortie but had been informed that none could be provided at the time, apparently because of a shortage of control capacity brought about by a dearth of controllers, which was unfortunate. The Board recognised the manpower constraints currently placed on military units and it was pointed out that LATCC (Mil) has a set order of priorities for service from the ATCRU, depending on the classification of the airspace in which the flight takes place and the nature of the task, allocating their finite controller resources accordingly. The ASACS Advisor suggested that the Air Defence organisation might have been able to help here if ATC was working to capacity. ASACS was always willing to provide a radar service if able and it seemed to the Members that this ACT sortie could well have been ideally matched to a service from a CRC. This might not have occurred to the lead Hawk pilot when planning the sortie, but it was a point well made and aircrews should consider all the possibilities open to them, both Air Defence as well as ATC, if the nature of their sortie is such that a radar service would enhance their situational awareness and hence their overall safety. The HQ AIR (Trg) Member agreed to take this point back to the unit concerned for consideration. Here, operating in the Vale of York AIAA – a promulgated Area of Intense Air Activity - Members agreed it was prudent to obtain a radar service if available and compatible with the nature of the sortie. Plainly, traffic information about the other ac provided under a RIS to the Hawk pilots might potentially have forestalled this close quarters situation. As it was, the Hawk formation pilots had to rely solely on their own lookout without any additional radar assistance to provide a 'long range' warning.

Clearly such limitations had to be taken into account in overall airmanship terms but it was apparent that both the Hawk formation and the BE350 were operating legitimately in this Class G airspace where 'see and avoid' prevails. It was unfortunate that the Hawk pilots had not spotted the BE350 earlier. Evidently, it was there to be seen in the reported CAVOK conditions and should have been apparent to them as they 'cleared' their L turn about. However, it was plain that their lookout had been defeated and it was evident from the No2 Hawk pilot's candid account that he had not spotted the BE350 until his colleague had called a warning over the RT for him to execute a 'bunt' to avoid it. The radar recording had not reflected this but the No2 Hawk pilot's report stated that his 'bunt' had resulted in 500ft vertical separation beneath the BE350 at the critical moment. From the Hawk pilots' perspective the Board agreed that even though this was a close quarters situation and the warning about the BE350 came at a late stage, the reporting pilot had done his part in resolving the conflict.

It was unfortunate that the DTVA APR had not provided an account of this occurrence. Nevertheless, the comprehensive ATSI report, coupled with the RT transcript, had made the ATC aspects of this Airprox plain for the Members. The transcript had confirmed that the APR had provided traffic information about the Hawk formation as soon as the BE350 flight had been identified which presaged TCAS contact and prompt visual acquisition by the crew. Thus it was indeed fortunate that the BE350 PF was primed and ready to react immediately when it became evident that the formation were turning about and were now closing rapidly from the L. Whilst the Hawk formation was undoubtedly responsible for giving way under 'the Rules', the BE350 crew evidently responded correctly. Their prompt reaction to the demanded TCAS RA was indeed evident from the radar recording which evinced the twin's climb, thereby affording 300ft of vertical separation over the No2 Hawk at the CPA of 0·3nm. This was the only tangible evidence of vertical separation which steadily increased to 600ft above the No2 Hawk after the jet had crossed beneath the twin. So although the tracks crossed in between sweeps, vertical separation appeared to be no less than the 300ft shown beforehand and probably a little more. The Board concluded, therefore, that the BE350 crew had also successfully accomplished their part in resolving this conflict. Moreover, the combined effect of the visual sightings and avoiding action taken by both crews ensured that, in the Board's view, no risk of a collision had existed in the circumstances conscientiously reported here.

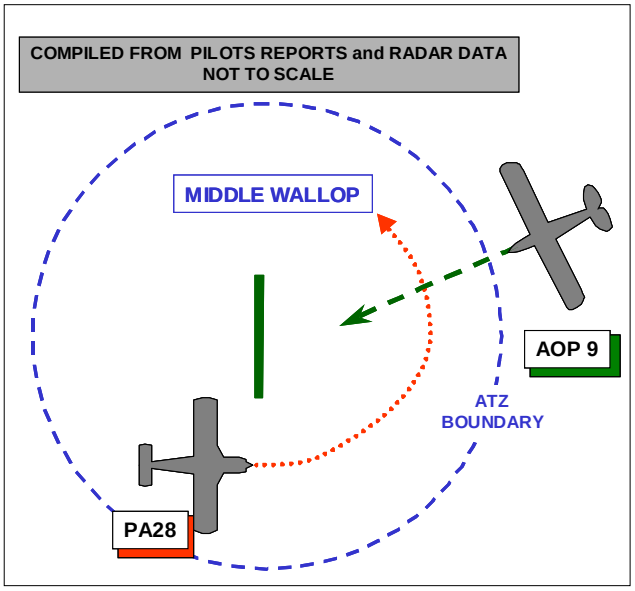
## PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in the Vale of York AIAA resolved by both crews.

Degree of Risk: C.

## AIRPROX REPORT NO 082/08

| | | |
|---|---|---|
| *Date/Time:* | 10 Jun 1437 | |
| *Position:* | 5109N 00134W (Middle Wallop - elev 297ft) | |
| *Airspace:* | ATZ | (Class: G) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | Auster AOP9 | PA28 |
| *Operator:* | HQ DAAvn | Civ Trg |
| *Alt/FL:* | 2000ft | NK |
| | (QFE 1013 mb) | (N/K) |
| *Weather* | VMC CAVOK | VMC |
| *Visibility:* | >10nm | >10km |
| *Reported Separation:* | | |
| | V 0ft /H200m | Not Seen |
| *Recorded Separation:* | | |
| | NR | |




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

**THE AUSTER AOP9 PILOT** reports that he was returning to base after a training sortie in a camouflaged ac with nav lights switched on, squawking 2677 with Mode C and in receipt of a FIS from Wallop TWR. He flew inbound from the Harewood VRP [a local VRP, 4.5nm ENE of the field] straight and level at 2000ft QFE, heading 240° and at 70kt, for an overhead re-join for RW36. At about 3nm, he was given an initial indication of conflicting traffic which suggested to him that the other ac was crossing from left to right and would be clear before he reached the overhead. His impression was that the other ac would pass through his 12 o'clock about 1nm away and so he scanned the 9-3 o'clock arc trying to see it.

He did not to see the other ac and, as he was almost in the overhead, the controller again asked if he was visual, giving him a more accurate bearing and distance. He lifted his left wing and a light coloured ac became visible 200m away from under the wing strut; it was also straight and level and was on a converging course. He tightened the turn quite steeply to allow the ac to pass, before continuing the dead side descent part of the overhead re-join. The other ac continued to fly on course towards Thruxton. He assessed the risk as being very high.

The controller discussed the incident with him after he landed and said he would report the incident.

**THE PA28 PILOT** reports flying solo as a student pilot (using a callsign prefixed by 'student') on a cross-country from Sywell to Thruxton in a white and orange ac with nav lights, the anti collision beacon and landing lights switched on, squawking 7000 with Mode C. He contacted Boscombe Down ZONE for a FIS and MATZ penetration with the intention of landing at Thruxton. He was then informed that he was SW of Andover which was 10$^{o}$ off his intended track and was given a heading of NE. He then located Andover and requested a frequency change to Thruxton Radio who he contacted and was passed the airfield information. However, he incorrectly identified Middle Wallop as Thruxton and approaching the overhead he realised from the shape of the buildings that he was in the wrong location. With guidance from Thruxton Radio he located the correct airfield where a join and landing was safely carried out. He did not see any traffic overhead Middle Wallop.

After landing he discovered that he had set the DI incorrectly during his cruise checks leading to his drifting off the planned track towards Southampton on the route from Sywell. Also he might have misidentified Andover initially when given the NE heading from Boscombe Down ZONE.

**THE PA28 INSTRUCTOR** (not in the ac) reports that his student had flown over 120 hrs training for his PPL and that this flight was the qualifying cross-country navigation exercise. A full pre-flight briefing was completed ensuring the student fully understood all safety, navigation and weather factors. The navigation exercise started at White Waltham with the first landing at Northampton Sywell; the following at Thruxton and then a return to White

Waltham. After the flight, being aware of the navigation error, he asked the student to do a short navigation exercise with him but he could not find any obvious reason for the [heading] drift error. He suggested that perhaps the student might have omitted the cruise checks for some time while following landmarks on the ground; in his experience this is a common mistake amongst PPL students. He directed that the student should undertake further dual navigation flights.

**THE MIDDLE WALLOP SATCO** reports that at 1434 Middle Wallop APR observed unknown traffic enter the ATZ and track SW through the Northern portion of the ATZ. The ac was displaying a squawk of 2650 (Boscombe Down FIS conspicuity) and the Mode C was indicating a descent. Recognising the potential confliction, the controller brought the unknown traffic to the attention of the ADC before contacting Boscombe Down to obtain further TI but they confirmed that the ac had been released to Thruxton as is SOP when ac are NE of Andover and was no longer working their unit.

The ADC visually acquired the unknown ac which then turned overhead at circuit height before climbing away to the E. The ADC passed TI to an Auster that was joining overhead from the Harewood VRP at 2000ft QFE; he later updated the TI on several occasions and asked the pilot if he was visual.

The ac involved were an Auster that was receiving an Aerodrome Control Service at Middle Wallop and a PA28 believed to be receiving an Air/Ground service from Thruxton Radio at the time of the incident but previously a FIS from Boscombe Zone. Due to the types of service being provided in Class G Airspace, no separation was required to be provided.

His investigation revealed that both the ADC and the APR more than fulfilled their obligations towards the ac under their control.

After the Airprox occurred, both the PA28 student and his instructor telephoned to offer their apologies for the event.

UKAB Note (1): The recording of the Pease Pottage radar shows the track of the PA28. At the start of the recording the PA28 can be seen squawking 2650 tracking in a NNE direction towards Andover 5nm to the E of Middle Wallop and at an alt of 2800ft (London QNH 1023mb). The Auster cannot be seen. At about 1432 near Andover the PA28 reverses its track onto SSW, heading directly towards Middle Wallop and descending to an alt of 1600ft. The contact becomes intermittent about 2nm N of Middle Wallop but appears to continue to track towards the airfield before starting to manoeuvre. It reappears 1nm SW of the airfield tracking E, as a primary only contact, presumed to be the Auster, appears 3nm NE of the airfield tracking SW. At 1436, the PA28 then turns onto a NE track at an alt of 2300ft heading directly towards the Auster. The Auster's contact then also becomes intermittent but reappears in the PA28's 1 o'clock at a distance of just under 1nm. The Auster's contact disappears again but the PA28 passes over the projected position of the Auster at an alt of 2300ft just before 1437. No SSR is observed at any time on the radar recording from the Auster.

UKAB Note (2): The Middle Wallop ATZ is 2nm in radius and extends up to 2000ft aal (2469ft amsl). It is located within the Boscombe Down CMATZ and Boscombe Down is the controlling authority.

**MIL ACC** comments that the initial CTR infringement was of the Solent CTR. The PA28 pilot free-called Boscombe LARS uncertain of his position and an SSR code of 2650 was issued. The ac was identified and climbed to allow the Boscombe LARS Controller to provide vectors away from Solent's departing traffic. Following further vectoring the pilot became satisfied with his position when the ac was 5nm S of Andover. Shortly after that he was released VFR to Thruxton in accordance with agreed procedures.

**HQ DAAvn** did not comment.

## PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac, a radar video recording, reports from the air traffic controllers involved and a unit ATC report from Middle Wallop.

Members agreed that the PA28 student pilot had been uncertain of his position for some time and, even when given vectors by Boscombe Down, he was not able to rectify the situation. They also agreed with the instructor

that this was possibly indicative of flying the incorrect heading and not being able to reconcile why the picture as portrayed on his map was not what he was seeing outside. They also suggested that the description of events could be interpreted as indicating a degree of panic in the cockpit and a lack of concentration on the basics even when Boscombe Down Radar had put the ac in a known position close to a large and arguably unmistakeable landmark i.e. Andover. Further, it was pointed out that Middle Wallop is a grass airfield with hangars on the North side while the runways (including the disused one) at Thruxton are largely asphalt surfaced and the hangars are on the West side. However, the pilot was a student and Members agreed that his instructor had acted in a professional manner and taken corrective action to ensure that his pupil learned from the incident such that he should not make similar mistakes again.

When discussing the lookout aspects, Members were not surprised that the PA28 pilot had not seen the Auster as he most likely had been engrossed in trying to determine his position. Although a GA Member was surprised that the Auster pilot had not seen the PA28 despite its erratic track, another - who had flown the AOP9 - pointed out that for relatively tall pilots the field of view, both to the side and downwards, is restricted by the wing structure as the top of cockpit extends well up into the wing. Members therefore agreed that lookout had not been the primary cause of the incident.

The Board accepted the SATCO's assessment that ATC had not been a significant causal factor in this incident. The controller had given TI to the Auster pilot but, due to the unpredictable track of the PA28, the information had been outdated almost as soon as it was passed.

Notwithstanding the lookout aspects above, the Auster pilot had joined the circuit in the correct manner and, following the information available to him, had attempted to locate the other ac that might conflict with his intended joining procedure that is designed to enable pilots to see other ac in the circuit rather than ATZ infringers. Members therefore agreed that the prime cause of the incident had been that the PA28 pilot had flown through the Middle Wallop ATZ in an unpredictable manner without gaining entry permission as required by the ANO (Rules of the Air ~ Rule 45). Further, since he had most likely been fully occupied with locating Thruxton having just discovered that he was approaching the wrong airfield, he had not seen the Auster and had inadvertently flown into conflict with it in the circuit area (Rules of the Air ~ Rule 12).

Regarding the degree of risk, Members agreed that despite the incomplete information available, the tracks of the 2 ac had been such that they were not going to collide; however, since neither pilot had seen the opposing ac until it was to late to take any avoidance, safety had not been assured.

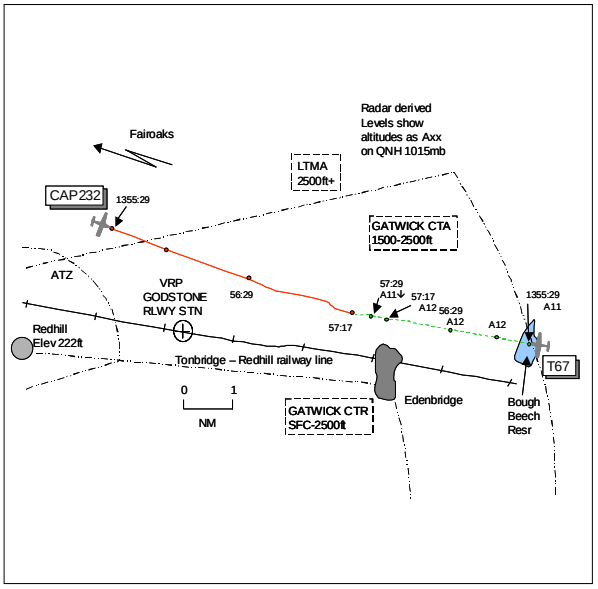
## PART C: ASSESSMENT OF CAUSE AND RISK

Cause: While unsure of his position, the PA28 student pilot entered the Middle Wallop ATZ without permission and flew into conflict with the AOP9 which he did not see.

Degree of Risk: B.

# AIRPROX REPORT NO 083/08

| | | |
|---|---|---|
| *Date/Time:* | 14 Jun 1357 (Saturday) | |
| *Position:* | 5113N 00003E (7nm E Redhill - elev 222ft) | |
| *Airspace:* | LFIR | (Class: G) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | Slingsby T67 | CAP232 |
| *Operator:* | Civ Pte | Civ Pte |
| *Alt/FL:* | 1300ft (QFE 1007mb) | 1500ft (QNH) |
| *Weather* | VMC CLBC | VMC NR |
| *Visibility:* | >40km | NR |
| *Reported Separation:* | 50ft V/ Nil H | Not seen |
| *Recorded Separation:* | NR | |




## PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

**THE SLINGSBY T67 PILOT** reports inbound to Redhill VFR and in communication with Redhill ATC on 119·6MHz squawking 7000 with Mode C. The visibility was >40km flying 3000ft below cloud in VMC and the ac was coloured yellow/black with strobe and anti-collision lights switched on. Returning to Redhill with a passenger feeling slightly unwell, he had been in receipt of a FIS from Farnborough E (123·225Mhz squawk 4641) until he approached Bough Beech reporting point when he changed frequency to Redhill and squawked 7000; no TI was passed. The Redhill frequency was very busy with a mix of cct and joining traffic; the controllers were working hard. Being familiar with the airfield and knowing the controllers, he made a minimal report of *'T67 c/s Bough Beech'* which was acknowledged with *'T67 c/s roger'*. From the ATIS he knew the RW in use as 26 and the standard join would require a next report at Godstone railway station. Given the busy cct he expected an O/H join for spacing at 1300ft QFE owing to Gatwick CAS at 1500ft QNH (Redhill airfield elevation 221ft). He followed the Tonbridge-Redhill railway line approximately 100-200m to the N keeping the line-feature to his L, as per the Rules of the Air, heading 270° at 108kt and 1300ft QFE. Abeam Crowhurst, he thought, he suddenly spotted a small ac 0·5nm directly ahead at the same level travelling in the opposite direction on a collision course. With CAS above and to his L by <1nm and aware that a R turn may not deconflict the 2 ac satisfactorily due to the rising L wingtip, he elected to descend rapidly. The G-meter showed that he had pushed –2g during the avoiding action as the other ac, a small low wing tail dragger, passed 50ft above with no avoiding action obvious from the other ac. There was <1sec from the time of first sighting until they passed. He tried to track the other ac through his canopy but it was out of sight within a second or so. Immediately he reported this 'near-miss' to Redhill who informed him that the only traffic there were aware of was a C152 outbound via Godstone town about 3nm N of his location; the conflicting ac was definitely not a C152. The sun was high in the sky in his 10 o'clock and in the other pilot's 4 o'clock so was not a factor in this incident to either pilot. He assessed the risk as low to medium.

**THE CAP232 PILOT** reports being unaware of an Airprox but provided brief details of the flight. She departed from Fairoaks en route to France VFR and was listening out with Redhill Information on 119·6MHz; the transponder was switched off. After departing Fairoaks RW24 and turning L to OCK climbing to 1500ft QNH she set course heading 110° on a track to pass 1nm N of Edenbridge. No other conflicting ac were seen on the route.

**ATSI** comments that the incident took place in Class G airspace, approximately 5·5nm E of Redhill Airport and about 3·5nm before the ATZ boundary. The Slingsby T67 was returning to Redhill under VFR, after a local flight to the E. Redhill is not radar equipped. At 1353, the pilot transmitted on the Redhill Tower frequency the ac's abbreviated c/s followed by *"…'s Bough Beech",* a reservoir 11nm E of the airport. The Redhill ADC acknowledged the call. No RT exchanges took place between the stations until 2min later, at 1355, when the T67 pilot reported *"…just had a near miss with an aircraft opposite direction on the wrong side of the railway line".* The ADC acknowledged the message and asked the pilot for the type of the aircraft seen. The pilot could not be sure but

thought it looked like an 'RV'. The ADC responded *"…the only traffic I've got is a one five two somewhere in the local area",* but the pilot stated that it was definitely not a (Cessna) '152'. Thereafter, the T67 was issued joining instructions and landed without further incident.

MATS Part 1, Section 1, Chapter 2, Page 4, Paragraph 6 Aerodrome Traffic Zone (ATZ), states *"Controllers are to provide an ATC service to aircraft within an ATZ and to aircraft under their jurisdiction in the vicinity of the aerodrome".* At the time of the incident the T67 was being provided an Aerodrome Control service. Aerodrome Control responsibilities are defined in the MATS Part 1, Section 2, Chapter 1, Page 1, para 2.1, where it states: *"Aerodrome Control is responsible for issuing information and instructions to aircraft under its control to achieve a safe, orderly and expeditious flow of air traffic and to assist pilots in preventing collisions between: a) aircraft flying in, and in the vicinity of, the ATZ"*.

The RT transcript shows that the CAP232 had not established communication with Redhill Tower: consequently, the Redhill ADC was unaware of its presence. Therefore, it is concluded that there are no implications for ATC in the cause of this incident.

UKAB Note (1): The radar recording shows the subject ac up to shortly before the Airprox. A primary only return is seen at 1355:29, believed to the CAP232 3nm NE of Redhill tracking 110° with a 7000 squawk O/H Beech Bough Reservoir, believed to be the T67, tracking 280° indicating altitude 1100ft QNH 1015mb. The subject ac continue on roughly head-on tracks until the CAP232 fades from radar, last seen at 1357:17, 1·25nm NW of Edenbridge with the T67 12 o'clock range 0·75nm indicating altitude 1200ft QNH. The CAP232 reappears on radar approaching Bough Beech Reservoir meanwhile the T67 indicates a momentary descent at 1357:29 to altitude 1100ft QNH for 2 sweeps before climbing back to 1200ft which is believed to be the avoiding action descent taken by the T67 pilot during the Airprox.

UKAB Note (2): It was evident that a discrepancy between the timings of the Redhill RT recording and the radar recording existed. The T67 pilot had been previously working Farnborough and the radar timings correlated consistently with the Farnborough RT transcript. However, the T67 pilot reports on the Redhill frequency over Bough Beech at 1353 but the radar shows the ac passing the position at 1355:29 with the same timing difference apparent when the pilot reports the Airprox. Redhill SATCO was contacted by Transcription Unit over 4 months post incident and asked for a current check of an accurate time source against the recorder clock which revealed a 5sec difference. A reminder was made to SATCO to ensure that the time injection on the recorder is checked at regular intervals against a master time source and any discrepancies be logged after calibration. The source of the evident timing error in this Airprox was not found.

## 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 not germane to the particular Airprox, Members wondered why the CAP232 pilot had selected her transponder off. The UK AIP recommends that pilots in these circumstances should select Mode A 7000 and Mode C in order to enhance flight safety by making the ac more conspicuous on radar to SSR equipped ATSUs and to ACAS equipped ac. Furthermore, the wisdom of using of Mode C has been extensively publicised under the Airspace & Safety Initiative (ASI), a joint CAA, NATS, AOA, GA and MoD effort to investigate and tackle the major safety risks in UK airspace. Pilot Members also wondered why the CAP232 pilot only listened-out but did not call on the Redhill frequency as any transmissions broadcast would have given the other pilots on frequency better situational awareness with regards to traffic in the area. Also, the T67 pilot's brief report at Bough Beech did not provide sufficient information for other pilots to build a mental picture of his route/intentions. That said, RT exchanges only ever complement the primary means of maintaining separation in Class G airspace through 'see and avoid'.

The routes flown by both pilots under the Gatwick CTA had placed both ac within a narrow 'letterbox' of airspace, removing any choice of flying at a higher altitude for separation purposes. As it was, the planned direct track subsequently flown by the CAP232 pilot, to pass N abeam of Edenbridge, had placed her ac on a conflicting flightpath with the T67 pilot routeing towards Redhill following the RH Rule with respect to the railway line. The small head-on target aspect presented by both ac to each other's pilots would have made visual acquisition more difficult but possible through maintaining a thorough lookout scan for conflicting traffic. In this case Members were

in no doubt that the cause of this Airprox was a non-sighting by the CAP232 pilot and a late sighting by the T67 pilot.

Risk-wise, the T67 pilot had only a very short time to assimilate that the CAP232 was on a conflicting flightpath before taking avoiding action by descending rapidly to pass beneath it. The Board agreed that the robust avoiding action taken had been sufficient to remove the actual risk of collision but the ac had passed in such close proximity, unsighted by one of the pilots, that Members agreed safety had been compromised during the encounter.

**PART C: ASSESSMENT OF CAUSE AND RISK**

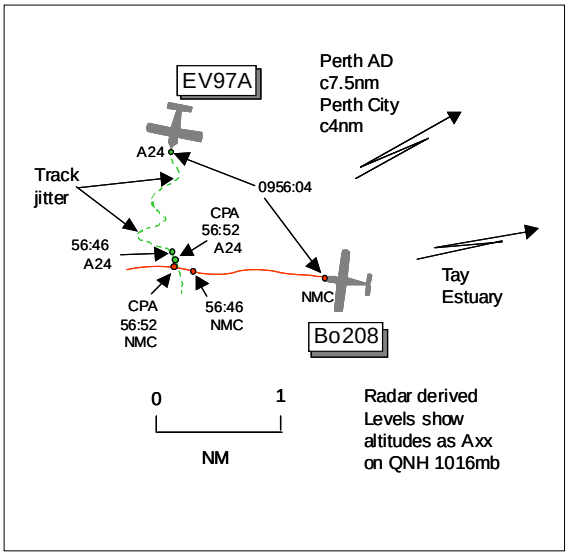
Cause: A non-sighting by the CAP232 pilot and a late sighting by the T67 pilot.

Degree of Risk: B.

## AIRPROX REPORT No 084/08

## AIRPROX REPORT NO 084/08

| | | |
|---|---|---|
| *Date/Time:* | 21 Jun 0957 (Saturday) | |
| *Position:* | 5622N 00334W (4nm SW Perth City) | |
| *Airspace:* | ScFIR | (Class: G) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | EV97A Eurostar | Bo208 Junior |
| *Operator:* | Civ Pte | Civ Pte |
| *Alt/FL:* | 2000ft | 1500-2000ft |
| | (QNH 1016mb) | (RPS) |
| *Weather* | VMC CLBC | VMC NR |
| *Visibility:* | >10km | NR |
| *Reported Separation:* | | |
| | 30ft V/Nil H | Not seen |
| *Recorded Separation:* | | |
| | <0·1nm | |




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

**THE EV97A EUROSTAR PILOT** reports inbound to Perth from Prestwick VFR and in communication with Perth Radio 119·8MHz squawking with Mode C. The visibility was >10km flying 2000ft below cloud in VMC and the ac was bare metal finish with strobe lights switched on. He had phoned Perth at 0930A for PPR intending to arrive at 1100A for a fly-in/airshow. He was told that things were busy and it would be helpful to do a standard O/H join. He departed Prestwick at 1005A and was cleared through the Glasgow Zone from Kilmarnock to Baillieston. After Baillieston he spoke to Cumbernauld and then Scottish Information and were informed of other ac in the vicinity making their way to Perth. His passenger, an ex-PPL, assisted him with keeping a good lookout. About 10nm SW of Perth he changed to Perth Radio frequency which was extremely busy so it took some time to get his initial call in. On initial contact he was told that they could not accept him as the airfield was closed for about the next 15min so he decided to orbit L. Other pilots were calling and querying the closure status and it was mentioned that someone was carrying out a practice display. There were lots of ac around and quite a few inbound. After his 3rd or 4th orbit whilst looking down the Tay estuary turning through 090° at 2000ft, he thought, QNH 1016mb and 90kt, another light ac, a high wing single engine type coloured predominately white, passed very close below (approximately 30ft) heading 270°. He took no avoiding action as it all happened too quickly for him to react. He estimated the closing speed was about 200mph and that, combined with the ac's approach below the horizon and their LH orbit, had made it very difficult to see. Assessing the risk as high, he opined that this encounter could have been avoided if he had been informed of the airfield closure coinciding with his arrival time.

**THE Bo208 JUNIOR PILOT** reports, several months post incident owing to delayed tracing action, that he departed from Kingsmuir with an experienced ATPL passenger at 1030Al and arrived at Oban at 1150A, so the time for passing S of Perth would have been 1050A or 1055A. However he was unaware of being involved in an Airprox. It was a clear day with good visibility and being aware that there were two fly-ins at local airfields (Perth and Fife) they were keeping a good look out. They were flying a constant track of around 280°M at a constant speed of 90kt and were maintaining a constant altitude, either at 1500ft or 2000ft on the regional QNH, but definitely no more than 2000ft. Working Scottish Information they were monitoring other traffic and heard the radio transmissions between 'ATC' and the Eurostar flight on its way between Cumbernauld and Perth. They heard the Eurostar pilot leave Scottish Information only to come back a few minutes later to advise that Perth were unable to accept him due to a practice air display. At that point they heard the Eurostar pilot say to Scottish that he thought he had had an Airprox but without giving any detail. Scottish asked him if he wished to report it and he said words to the effect that he was uncertain. At the time he, the Bo208 pilot, did not associate the Airprox with his ac because as far as he could remember his location was somewhere to the E of a direct track between Cumbernauld and Perth. They certainly did not see the EV97A which is surprising if it was as close as the pilot reported, given the fact that the Bolkow 208 has a particularly good field of vision forward and upward and that they were consciously maintaining a good look out because of the expected heightened level of activity on the day. He apologised for not being able to provide any more information as, not having seen the other ac, it was difficult to

make a judgement as to whether they were in any real danger of a collision or not but he was fairly certain that the Eurostar did not come into his normal field of vision.

**THE ScACC FISO** reports, one month after the incident, that the EV97A was enroute to Perth and was being provided with a FIS. The flight was transferred to Perth frequency but returned shortly afterwards to inform him that Perth was closed for a period as practice was taking place for an air display that afternoon. The EV97A pilot also told him that there were a number of ac holding to the SW of Perth and that he had been in close proximity to one. He asked the pilot if he was going to file an Airprox and he replied he would think about it. The FISO asked to be kept advised of his decision. From his fps display it was not obvious that the other ac involved was one of his 'known traffic'.

**NATS ScACC INVESTIGATIONS** reports the FISO is equipped with fpss, maps, telephone and RT but does not have access to radar. A conspicuity squawk of 7401 is issued to flights receiving a service. The EV97A pilot contacted the FISO at 0939:40 reporting that the ac type was a Eurostar enroute from Prestwick to Perth passing Stirling at 2500ft 1016mb and estimating Perth at 1000UTC requesting a FIS. A FIS was given along with an instruction to squawk the FIS conspicuity code of 7401 with Mode C. The Portree RPS of 1011mb and information regarding para-dropping at Strathallan was passed to the flight. The Bo208 pilot called at 0946:50 reporting *"...we're a Bolkow Junior 2000ft approaching Perth to Oban and requesting Flight Information Service please"*. The FISO confirmed the FIS and asked the pilot to squawk 7401 with Mode C. The Bo208 pilot readback *"7401 [abbreviated c/s]"*. The FISO then enquired *"...what's your intended routeing towards Oban"* to which the pilot replied *"Pretty much direct track actually from here"* and then the FISO confirmed that the Bo208 pilot had the Portree RPS of 1011mb current until 1100UTC. At 0951:30 the EV97A pilot reported Perth airfield in sight and his intention to change frequency to Perth Radio on 119·8MHz, which was agreed, as well as a change of squawk to 7000. Later at 1000:30 the EV97A pilot recalled the FISO advising that Perth airfield was closed as an air display was about to start, that they were going to divert to Dundee, and asking for the Dundee frequency. This was given by the FISO and that they were not aware of any closures for a display. After reading back the frequency the pilot stated that Perth expected the display to last 5-10min and that there were a lot of ac holding SW of Perth. The pilot also intimated that he had been involved in an Airprox with another ac 100ft below flying in the opposite direction. As this was not a formal declaration the FISO asked for confirmation if the pilot was going to file after landing to which he replied that he would think about it. He asked the pilot to let him know and to report leaving the frequency for Dundee. The FISO telephoned Perth who confirmed that a practice display was in progress, ahead of the display in the afternoon, (closure NOTAM'd) and there was a short delay before Perth could accept ac. At 1009:30 the Bo208 pilot announced he was leaving the frequency but there was no mention of his intention to file an Airprox.

The FISO stated he was expecting a lot of ac around Perth owing to the fly-in/airshow and had believed that the Bo208 pilots call of 'approaching Perth to Oban', which omitted the aerodrome of departure, had led to him thinking that its departure point was Perth. (Note: After listening to the RT recording, the word 'approaching' was only picked up after several replays). The FISO also commented that he had discounted the Bo208 as traffic to the EV97A as he believed the Bo208 had departed Perth to the W at least 13min before the EV97A was estimating Perth from the SW. He stated they he was so busy with the Perth fly-in traffic on the day, as well as ascertaining when Perth would be open for traffic, that he did not consider it might have been prudent to make a Watch Log entry regarding the possibility of an Airprox being filed. This scenario has since been discussed amongst FISOs and awareness of Watch Log entries has been raised.

**ATSI** endorsed the NATS Unit report.

UKAB Note (1): The Lowther Hill radar recording shows a 7000 squawk, believed to be the EV97A, orbiting 7nm SW of Perth airfield (4nm SW Perth City) indicating unverified altitude 2400ft Glasgow QNH 1016mb, with another ac squawking 7401 with NMC, believed to be the Bo208, approaching from the SE on a track of 280°. By 0956:04 the EV97A is turning L through a SSW'ly heading at altitude 2400ft with the Bo208 1·6nm to its SE. Thereafter the EV97A return exhibits severe track jitter as the ac approach the CPA until 0956:46 when the EV97A is turning through a SSE'ly heading with the Bo208 in its 10 o'clock range 0·25nm. The next sweep at 0956:52, the CPA, the radar returns almost merge, separation <0·1nm as the subject cross, the EV97A still indicating altitude 2400ft and apparently on a steady SSE'ly track and the Bo208 NMC. If the Bo208 pilot was flying level at his altitude reported to the Scottish FISO - 2000ft Portree RPS 1011mb - vertical separation would have been in the region of 250ft.

## AIRPROX REPORT No 084/08

### PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Without radar, the FISO was totally dependant on accurate position reports from pilots to build his mental picture of the traffic situation. Having not assimilated that the Bo208 was 'approaching' Perth, when its pilot did not report his airfield of departure, the FISO had dismissed the Bo208 as being 'known traffic' to the EV97A which was already on frequency routeing to Perth. The FISO's traffic picture was further 'clouded' when the Bo208 pilot, after being asked his routeing to Oban, had replied '... direct from here'. From this reply and without radar, it would be very difficult for the FISO to readily assimilate the Bo208's position and intended routeing into his mental picture of the overall traffic situation.

The EV97A pilot's situational awareness was also reduced as he would have heard the same RT calls from the Bo208 prior to leaving the frequency for Perth just over 5min before the Airprox. The whole situation was then not helped when Perth were unable to accept inbound traffic, to which they had issued slot arrival times, owing to a short notice air display practice. This temporary closure of Perth had led to the subject EV97A pilot taking up a hold to the SW of Perth. It was during this visual hold that the EV97A pilot saw the Bo208 but only as it passed underneath with no time to react. Members therefore agreed that the cause of this Airprox had been an effective non-sighting of the Bo208 by the EV97A pilot whilst the EV97A went unsighted to the Bo208 pilot.

The EV97A pilot had reported the vertical separation as 30ft post incident and 100ft on the RT, after he had returned to the ScACC FISO frequency and was deciding whether to file an Airprox. The Bo208 pilot had not seen the EV97A but opined that had it passed very close O/H he would have seen it owing to the excellent field of vision forward and above from his cockpit. The radar recording reveals the EV97A orbiting at 2400ft Glasgow QNH 1016mb (equating to 2250ft RPS 1011mb) whilst the Bo208 was showing NMC although its pilot had reported on the RT as flying at 2000ft RPS. Taking all of these factors into account, on the balance of probability, Members believed that in the heat of the moment the EV97A pilot had misjudged the actual separation distance between the subject ac, an easy error to make when catching a quick glimpse of a fast moving object, with vertical separation in the order of that gleaned from the radar and RT. Although the ac had passed each other with an element of luck, the separation that pertained had ensured that the ac were not going to collide but the Board concluded, without doubt, safety had not been assured during the encounter.

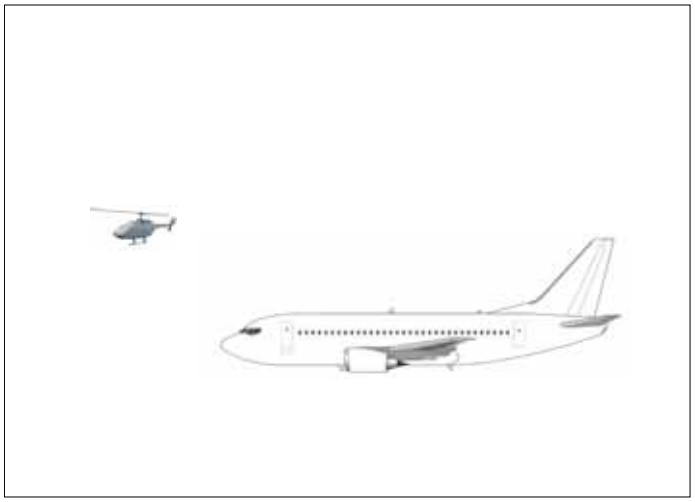
### PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A non-sighting by the Bo208 pilot and an effective non-sighting by the EV97A pilot.

Degree of Risk: B.

## AIRPROX REPORT NO 085/08

| | | |
|---|---|---|
| *Date/Time:* | 22 Jun 1032 (Sunday) | |
| *Position:* | 5157N 00019E | (5nm NE Stansted) |
| *Airspace:* | Stansted CTR | (Class: D) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | B737 | Untraced |
| | | (Model) Helicopter |
| *Operator:* | CAT | NK |
| *Alt/FL:* | ↓2000ft | NK |
| | (QNH 1008mb) | NK |
| *Weather* | VMC CLBL | NK |
| *Visibility:* | 10km | NK |
| *Reported Separation:* | | |
| | 300ft | NK |
| *Recorded Separation:* | | |
| | NR | |



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

**THE B737 PILOT** reports flying a scheduled passenger flight to Stansted, in contact with Stansted APR and squawking as directed. While heading 225° at 160kt on the approach to RW23, at about 5nm and 2000ft on the ILS, he observed what appeared to be a remote control model helicopter about 300ft above and to the left of the ac. They informed ATC at Stansted after landing.

UKAB Note (1): Despite extensive investigation the model ac could not be traced. On the day in question there was a very strong (20/30kt) southwesterly wind. Expert opinion from the British Model Flying Association was that this was too strong for the operation of model ac. That being the case, the British Rotorcraft Association was contacted to determine if they could assist. The Association confirmed that even light rotorcraft could be operated in such wind conditions but having checked, they were not aware of any activity in that area. Further, the Association thought it unlikely that any of their members would operate a craft in that area without the permission of Stansted ATC. The B737 captain was then contacted but he reported that only the First Officer had seen the helicopter. The First Officer was contacted in turn but he remained fairly sure that the ac was a model rather than a manned ac and that it had a single tail boom. When asked if it could have been a balloon or collection of balloons he thought not as it appeared to have a tail boom. There were several town/village fêtes in the area upwind of Stansted but due to the First Officer's report it was considered unlikely that the object seen had been balloons (Met or otherwise), further no stray balloons were reported to the CAA. The UKAB Secretariat was therefore not able to trace the conflicting ac.

UKAB Note (2): Stansted APR was not aware of the incident/infringement until the B737 pilot reported it after landing.

UKAB Note (3): The Stansted METARs for the period are below:

EGSS 220950Z 23021G31KT 9999 FEW022 SCT028 19/13 Q1008=

EGSS 221020Z 23021G31KT 9999 SCT030 20/12 Q1008=

EGSS 221050Z 25019G30KT 9999 SCT033 21/10 Q1008=

EGSS 221120Z 24020KT 9999 FEW040 20/09 Q1008=

UKAB Note (4): Although the reported model helicopter did not show on radar, there were many primary returns in the area; they were attributed to ANAPROP.

## AIRPROX REPORT No 085/08

### PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of the B737, transcripts of the relevant RT frequencies and radar video recordings.

The Board was briefed by the Secretariat on the extensive work undertaken in an attempt to identify the ac reported by the B737 First Officer as a model helicopter. Due to the very strong, gusting wind and the alt of the reported ac (2000ft) Members thought that it was more likely to have been be a manned powered ac (or rotorcraft) rather than a model. In either case, since the incident had taken place in Class D airspace and no permission had been given by ATC to operate there, there had also been CAS infringement.

Due to the inability to determine what type of ac was reported or its intentions the Board was not able to determine the degree of risk.

### PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in Class D airspace with an untraced light helicopter or model.

Degree of Risk: D.

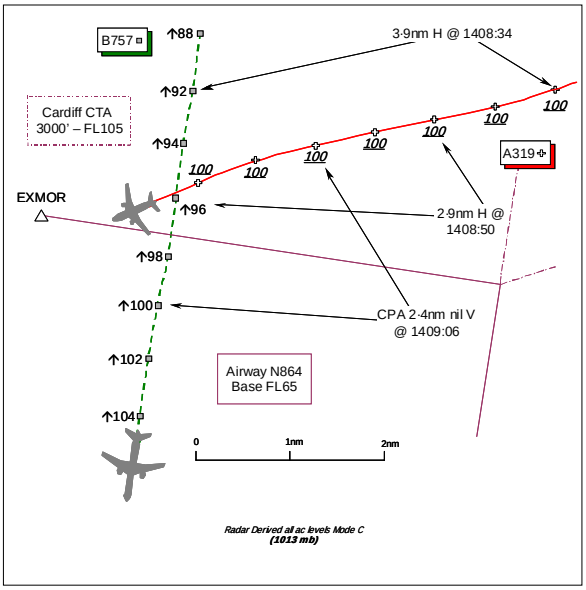
# AIRPROX REPORT NO 086/08

*Date/Time:* 24 Jun 1409
*Position:* 5110N 00318W (2nm E of EXMOR)
*Airspace:* N864/Cardiff CTA (Class: A)
*Reporter:* Cardiff ATC

| | *1st Ac* | *2nd Ac* |
|---|---|---|
| *Type:* | B757-200 | A319 |
| *Operator:* | CAT | CAT |
| *Alt/FL:* | ↑FL150 | FL100 |
| *Weather* | NR | NR |
| *Visibility:* | NR | NR |

*Reported Separation:*
By Cardiff ATC: 200ft V/2·5nm H
NR NR

*Recorded Separation:*
Nil V/2·4nm H




## PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

**THE CARDIFF RADAR 1 CONTROLLER (RADAR 1)** provided a candid account reporting that at about 1445 another flight requested a Surveillance Radar Approach (SRA), which was accepted. During the progress of the SRA, Cardiff TOWER requested release on the B757 outbound to Alicante: this release was approved on an EXMOR 1B SID. When the B757 crew called on frequency, the flight was routed direct to BHD climbing to FL150. This conflicted with the A319 that had departed from Bristol bound for Madrid climbing to FL100. Whilst he was focused on the SRA he believed that the B757 and A319 passed one another abeam EXMOR at a range of 2·5nm, vertically separated by 200ft – at less than the prescribed horizontal separation minima [3nm]. Neither traffic information nor avoiding action was proffered.

**THE B757-200 CREW** could recall nothing of this incident and no report was rendered.

**THE A319 PILOT** could recall nothing of this incident and no report was rendered.

**ATSI** reports that at the time of the Airprox, the Cardiff RADAR 1 and 2 positions were both open. Due to the light traffic levels it was not considered necessary to open the CO-ORDINATOR position. The RADAR 1 controller - a designated Deputy Watch Manager - had been rostered to be the Acting Watch Manager for the first hour of the afternoon watch. The oncoming Watch Manager took over the management responsibility from the Acting Watch Manager as planned, shortly before the Airprox occurred, by which time he, the Watch Manager, was also operating as the RADAR 2 Controller. At 1354, a flight inbound to Cardiff, under the control of the RADAR 1 controller, requested an SRA to RW12. RADAR 1 considered that the traffic situation was light enough to allow him to carry out the SRA. Consequently, he agreed to provide the approach and informed the pilot that, in accordance with local procedures, the SRA would terminate at 2nm from touchdown. Just after this, the oncoming Watch Manager arrived in the Approach Control Room (ACR). There was a problem with the manning of the shift which RADAR 1, in his capacity as Acting Watch Manager, had been considering since he had arrived for duty an hour earlier. He took the opportunity of discussing this with the oncoming Watch Manager before the latter took over the RADAR 2 position at 1358. For approximately the next 10min RADAR 1 vectored the flight whose pilot had requested an SRA towards final approach for RW12. RADAR 1 did not mention the forthcoming SRA to the RADAR 2 Controller. However, about 5min after taking over the RADAR 2 position the latter realised that it was taking place.

At 1403, the Cardiff ADC requested the B757's departure release, from RADAR 1, and the flight was released on an EXMOR 1B SID. This SID's routeing from RW12 is:

'Climb straight ahead. At **I-CDF** D2, at or above **1350ft**, turn right onto track 220° to cross **BHD VOR** R012 above **3500ft**. Intercept **BHD VOR** R009, to **EXMOR**. Cross **BHD** D51.7 at **5000**ft.'

Shortly afterwards, the A319 crew established RT communication with RADAR 1. The flight was airborne from Bristol, routeing towards EXMOR, climbing to FL100. The controller confirmed the route direct to EXMOR and advised the pilot to expect further climb 5nm before EXMOR. This was to ensure that the ac remained within CAS. Until the A319 reached Airway N864 at EXMOR, it was operating within the Cardiff CTA, the upper limit being FL105. The radar photograph timed at 1403:40, shows the A319 passing FL88, to the SE of Bristol Airport. The SRA ac was by now about 12nm NNW of Cardiff Airport – at about 15nm from touchdown. For the next 2min RADAR 1 controller continued to vector the SRA ac and also to control other flights inbound to Cardiff from the N.

At 1406, the B757 crew made their initial call on the RADAR 1 frequency, reporting passing 3000ft climbing to 5000ft. The flight was instructed to route direct to BERRY HEAD (BHD), climbing to FL150, the Standing Agreement level with LAC Swanwick. At the time, the A319, tracking SW at FL100, was 14·8nm SE of the B757. The two ac were cleared on conflicting flight paths, potentially crossing E of EXMOR. The SRA was now 10nm from touchdown and for the next 4min RADAR 1 turned his attention to carrying out the SRA and descending another inbound flight. He did not notice the confliction between the B757 and the A319. Consequently, no further contact was made with either the B757 or the A319 crews until 1410:50, when the pilot of the A319 transmitted his callsign. By this time the A319 had crossed behind the B757 and had turned southbound towards BHD.

[UKAB Note (1): The Burrington Radar recordings show that prescribed horizontal separation of 3nm was lost just after 1408:50, when the SRA was approaching 5nm from touchdown. At this point the B757 was climbing through FL96, crossing ahead of the A319, which was now drawing aft in the 8 o'clock some 2·9nm away, still within the Class D CTA. At 1409:06, the B757 climbed through the A319's level, 2·4nm to the SW of the latter –- at the CPA, the B757 now S of EXMOR within Class A CAS. The next sweep shows the A319 drawing further aft into the B757's 7 o'clock – still 2·4nm away - as the latter climbs above the A319. Prescribed horizontal separation was restored at 1409:38, as the A319 opened astern to 3nm and the B757 climbed through FL107.]

STCA did not activate on the Cardiff radar display during the incident. The non-operation of STCA is being investigated locally.

RADAR 1 agreed, with hindsight, that he should not have provided an SRA whilst controlling other traffic. He confirmed that he did not monitor the progress of the subject flights whilst distracted by providing the SRA. The controller added that the fps display, although correctly annotated, did not show the potential confliction because he had not correctly positioned the relevant fps's. The A319's fps was correctly positioned in the 'SOUTH' bay but that of the B757 had remained in the 'CENTRE' bay whereas it should also have been placed in the 'SOUTH' bay. RADAR 1 mentioned that he had also allowed himself to be distracted from his operational tasks by the manning problems occurring during the afternoon watch, especially when he was discussing the situation with the oncoming Watch Manager.

At the time of the Airprox, the Cardiff MATS Part 2, Page APR 1.3, stated that:

*'Radar 2 will provide SRAs unless RADAR 1 elects to retain the traffic'.*

Since this incident a Supplementary Instruction (SI 020/08) entitled 'Surveillance Radar Approaches' has been published. The procedure is now that:

*'Except in an emergency situation a surveillance radar approach shall not be provided by any controller whilst simultaneously providing an ATC service within the Delegated Airspace'.*

Here RADAR 1 agreed to provide an SRA whilst controlling other traffic. He believed he had the capacity to handle this SRA but allowed himself to be distracted by it, thereby not monitoring the progress of the B757 and A319. He did not notice the loss of separation until after it had occurred. By his own admission, he had also allowed himself to be distracted in the period leading up to the incident by Watch Manager tasks.

The local instruction, concerning the restriction of controllers carrying out an SRA, whilst also providing an ATC service, is welcome. It will address the issue, apparent on this occasion, of controllers allowing themselves to be distracted from their main task whilst also carrying out such a radar approach.

## PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It was unfortunate that, exceptionally, neither of the acs' crews involved here had recalled the occurrence and therefore felt unable to contribute to the investigation. However, as the radar recording had shown that the B757 had crossed 2·9nm ahead of the A319 - a mere 200yd less than prescribed minima - it was entirely understandable to the Members that the pilots involved did not recall anything of note. Indeed at the closest point, the radar recording evinced horizontal separation only 0·6nm less than the 3nm horizontal minima prescribed. Without the pilots' inputs, Members could only base their assessment of this Airprox on the reporting controller's account and that of the ATSI investigation. Nevertheless, it was clear from the outset that this was intrinsically an omission on the part of the RADAR 1 controller whose laudably frank account, coupled with the report from ATSI, enabled the Board to readily identify the fundamental cause of this Airprox.

The Board recognised that the RADAR 1 controller was oblivious to the confliction between these two ac which had not been apparent to him either from his fpss or observation of his radar display as he focussed closely on the provision of an SRA to another flight. Clearly the RADAR 1 controller had acted with the best of intentions but endeavouring to complete the SRA was to the detriment of the ATC service provided to the two flights involved in this Airprox. The ATSI investigation had shown that whilst RADAR 1 had every intention of monitoring his other traffic he was unable to split his attention sufficiently to ensure that separation between these two CAT flights continued to be assured whilst concurrently executing the SRA. Moreover, the controller was aware that RADAR 2 was available to undertake the SRA so he should have off-loaded this task. A civilian controller Member intimately familiar with both disciplines opined that Approach and Area working are intrinsically different and should not be combined on one operating position. The proof of the validity of that statement lay within this Airprox, which was a salutary lesson to the unwary of what can ensue through distraction, however well intentioned, from the principal task. The confliction in the vicinity of EXMOR should have been readily apparent to RADAR 1 and measures taken to resolve it but whilst concentrating on the SRA, his attention was diverted at the critical moments. Wisely, Cardiff ATC has taken appropriate steps with the revised SI to ensure that this situation should not arise again.

Whether the pilots involved would have seen the other ac and taken action themselves will never be known. However, the final safety net of TCAS stood primed to act but was presumably not called upon to do so in this relatively benign situation otherwise the pilots would have reported it. Nevertheless, this conflict went entirely unnoticed – no steps had been taken to engineer the ac's separation here and it was purely fortuitous that separation had not been eroded further. Neither did STCA alert him to the confliction, as it is not available to RADAR 1 with the Cardiff ASR at this position. The NATS Advisor briefed the Board that STCA is available on the Clee Hill Radar source and did trigger at the CO-ORDINATOR position but, in the prevailing traffic levels, this position was not open at the time. The dangers of what can occur when one becomes focussed closely to the detriment of an all-round scan of radar and fps displays was entirely evident to the Controller Members. The Board concluded unanimously that the cause of this Airprox was that whilst distracted by providing an SRA, RADAR 1 did not ensure that prescribed separation was maintained between the A319 and the B757. However, at the separation evident here, with TCAS ready to act if the situation had changed significantly, Members also agreed unanimously that no risk of a collision had existed in the circumstances conscientiously reported by the RADAR 1 controller.

## PART C: ASSESSMENT OF CAUSE AND RISK

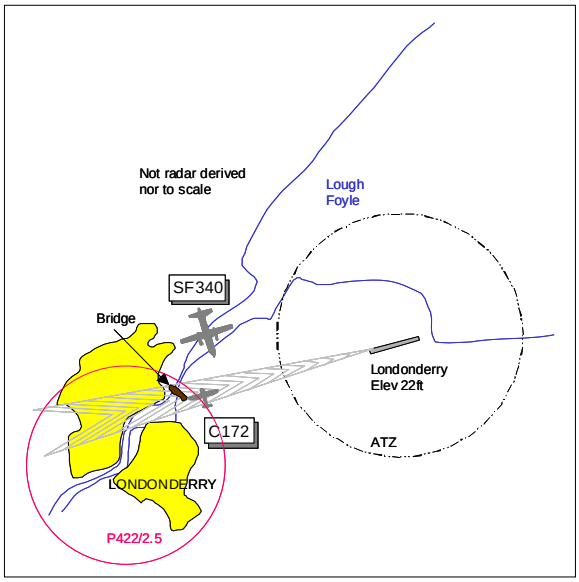
Cause: Whilst distracted by providing an SRA, RADAR 1 did not ensure that prescribed separation was maintained between the A319 and the B757.

Degree of Risk: C.

## AIRPROX REPORT No 087/08

## AIRPROX REPORT NO 087/08

| | | |
|---|---|---|
| *Date/Time:* | 21 Jun 1319 (Saturday) | |
| *Position:* | 5502N 00715W (3·5nm W Londonderry Airport - elev 22ft) | |
| *Airspace:* | ScFIR | (Class: G) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | SF340 | C172 |
| *Operator:* | CAT | Civ Pte |
| *Alt/FL:* | 1600ft (QNH 1011mb) | 1200ft (QNH) |
| *Weather* | VMC CLOC | VMC CLOC |
| *Visibility:* | 30km | >10km |
| *Reported Separation:* | 100ft V/100m H | 700ft V/2nm H |
| *Recorded Separation:* | NR | |




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

**THE SF340 PILOT** reports inbound to Londonderry IFR and in receipt of an ATS from Londonderry on 123·625MHz squawking with Mode C. They were initially 5·6nm I-EGT DME NE of Londonderry, positioning LH downwind visually for RW08. The FO was PF and ATC informed them of Cessna traffic operating 4nm to the W of the airfield and to the W. No traffic contact was seen on TCAS with range set to 12nm and they were asked to report LH downwind. This was accomplished passing abeam RW26 markers, level at 1600ft QNH 1011mb. At this time there was departing airliner traffic stationary on the RW08 threshold. They made a joint decision to turn base early at 3·2nm, level at 1600ft, in case the Cessna traffic was not transponder equipped and possibly 4nm W although they had no visual contact with it. They established on base RW08 heading 180° at 160kt I-EGT 3·5nm and by now the airliner had departed to the E. TCAS then annunciated 'traffic traffic' with the display showing a yellow symbol superimposed on their ac symbol but with NMC. Both crew members looked out for the traffic, the FO first seeing it, a C172, 300m dead-ahead and 100ft below heading due N straight at their ac. This placed the Cessna 3·5nm W of the airfield and operating N not, as informed, 4nm and to the W. The Cessna turned L steeply onto W in level flight whilst the FO also maintained level flight and turned L steeply onto E toward RW08, the ac passing 100m laterally and 100ft vertically at the CPA. They established on final approach and the Capt informed ATC of the near-miss. A safe approach, touchdown and landing were completed. He assessed the risk as very high.

**THE C172 PILOT** reports flying a local photographic sortie from Londonderry VFR and in receipt of a FIS from Londonderry squawking with Mode C. The visibility was >10km in VMC and the ac was coloured blue/white with wing-strobes and anti-collision lights switched on. He was orbiting LH at 45° AOB at 1200ft and 60kt just to the SW of the bridge at Londonderry and just outside the restricted area to the SSW. When he first saw the SF340 4-5nm away it was just a speck and he watched it pass 2nm clear and 700ft above without any need to take avoiding action. At its closest he looked at it through his 500mm camera lens and it did not fill the lens and he was unable to read its registration. His traffic avoidance system was set on 2nm and did not show the SF340. He commented that with over 8500hr experience and having had what one could describe as near-misses, this was not one of them.

**THE LONDONDERRY ADC/APP** reports the SF340 was inbound IFR in the descent to altitude 3500ft approaching the EGT. There was also a C172 operating approx 8nm N of the airfield along the N shore of Lough Foyle, carrying out a VFR photographic detail. At 1313UTC approximately, the C172 pilot reported routeing W to operate between Derry City and Inch Island. About 3min later the SF340 flight reported 8nm NE of EGT and visual with the airfield. The SF340 flight was cleared to continue visually to join LH downwind RW08 and TI was given on the C172 heading W. He then asked the C172 pilot for his position to which he replied "4nm W of the field"; TI was given on the SF340 joining behind him. The SF340 landed at 1321UTC and its crew reported that as they

turned onto final approach at 3·2nm the C172 passed across the front of their ac approximately 100ft below. He immediately asked the C172 pilot to report his position and altitude and whether he had been visual contact with the SF340 to which he replied "5nm W at 1300ft" and "affirm". The SF340 Capt later telephoned to say that he would be filing an Airprox on the C172.

The Londonderry MEATR shows EGAE 1250Z 12018KT 9999 SCT028 15/08 Q1011=

**ATSI** reports that the C172 was carrying out a VFR photographic detail and had been operating along the N edge of Lough Foyle, approximately 8nm N of the airport. At 1308, the pilot requested to continue the detail to operate between Londonderry and Inch Island, some 6-12nm W of the airport. The pilot was requested to report in the vicinity of the City. He commented that he was *"just coming up over Redcastle now"*, which is situated near the VRP at Moville, approximately 10nm NE of the airport.

The SF340 was inbound to Londonderry on an IFR flight from Glasgow and had already made an advanced call to Londonderry for the weather. At 1311, the SF340 pilot reported 25nm from the EGT, at FL70. He was cleared to the EGT descending to 3500ft, to anticipate a visual approach to RW08. Four minutes later, the pilot of the SF340 reported at 8nm, visual with the airport. He was *"clear to continue visually join and report left hand downwind runway Zero Eight"*.

The controller asked the pilot of the C172 his position which was reported as *"we are about four miles west of you"*. Information was then issued *"traffic is a SAAB Three Forty who'll be joining left hand downwind for runway Zero Eight from the northeast"*. After receiving an acknowledgement from the pilot, the SF340 pilot was informed about *"traffic you may see on your TCAS is a Cessna One Seven Two who's approximately four miles west of the field VFR heading west towards the City"*. He commented that it was not on TCAS yet.

At 1317:28, the pilot of the SF340 reported downwind LH RW08. He was instructed to report final No1 and was advised about a B737 backtracking, with which he confirmed he was visual. Approximately 3min later, the controller asked the C172's pilot if he had reached the City. The pilot responded *"we're just outside the zone boundary"*. The pilot of the SF340 subsequently commented about the C172 *"that Cessna as we turned final there thought it was operating four miles west of the field we turned final three miles and had a TCAS advisory and it flew straight across our nose"*. After the SF340 had landed the controller asked the C172 pilot his distance from the airport. This was reported as about 5nm and after an enquiry from the controller, the pilot confirmed he had been visual with the SF340.

The Londonderry controller issued appropriate TI to both flights which were operating in Class G airspace. There is no requirement to separate IFR and VFR flights in such circumstances.

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

UKAB Note (2): The UK AIP at AD 2-EGAE-1-5 promulgates the Londonderry ATZ as a circle radius 2·5nm centred on the longest notified runway (08/26) 550234N 0070940W SFC to 2000ft aal; elevation 22ft.

## PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members wondered how there could be such disparate sighting and separation distances reported by the pilots of the two ac involved in this Airprox. The C172 pilot reported seeing the SF340 several miles away and passing 2nm clear and 700ft above whereas the SF340 pilot stated first sighting at 300m with an eventual CPA of 100ft vertically and 100m horizontally. Both ac were reportedly squawking with Mode C such that ACAS should be fully active (in the sense that TCAS, for example, would be able to generate TAs and/or RAs should circumstances warrant). The SF340 pilot reports receiving a TA (only) which would perhaps suggest that either the C172's Mode C was not functioning correctly (such that an RA could not be generated to the SF340 crew) or the ac were adequately separated such that an RA was not warranted. Without the benefit of a radar recording it was not possible to resolve these anomalies; only the pilots involved at the time know exactly how close the ac passed during the encounter.

## AIRPROX REPORT No 087/08

Londonderry ADC/APP had discharged his responsibilities with regard to VFR and IFR flights in Class G airspace by passing TI to both crews based on their position reports. The C172 pilot had reported about 4nm W of the aerodrome and this was passed on to the SF340 crew, both crews having equal responsibility to maintain their own separation from other traffic through 'see and avoid'. However, the SF340 crew were surprised whilst on base leg at 3·5nm to the W then to encounter the C172. One Member opined that it appeared the SF340 crew had seen the C172 late and this had caused the Airprox, a view shared by two other Members. Others believed the visual acquisition of the C172 by the SF340 crew had probably occurred earlier than reported and in enough time for them to take action. Without any corroborating information regarding distances, the Board was left with no option but to classify this event as a conflict in Class G airspace.

In trying to assess risk, with two such disparate separation distances quoted, Members could only surmise what actually happened. The SF340 crew had reported flying at 1600ft on base leg whilst the C172 pilot reported 1200ft flying a LH orbit. The crews both reported seeing each other, the SF340 turning L whilst the C172 also turned L. Taking all of these factors into account, on the balance of probability, the visual sightings and actions taken were enough to allow the Board to conclude that there had been no risk of collision during this encounter.

### PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in Class G airspace.

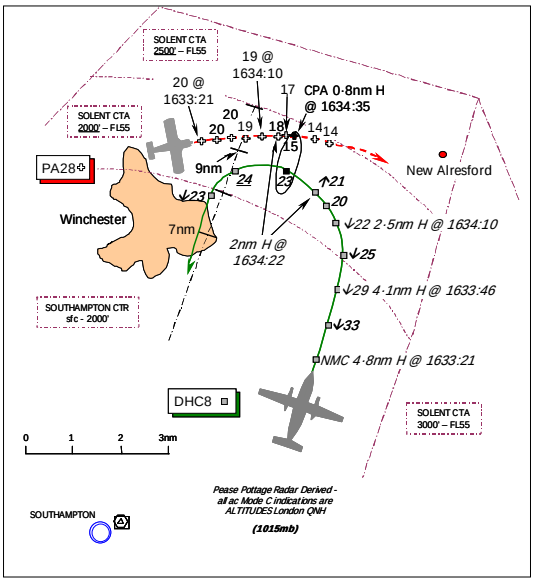
Degree of Risk: C.

# AIRPROX REPORT NO 088/08

*Date/Time:* 24 June 1634

*Position:* 5105N 00115W (9·5nm NNE of Southampton - elev: 44ft)

| | | |
|---|---|---|
| *Airspace:* | Solent CTA/FIR | (Class: D/G) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | DHC8D | PA28 |
| *Operator:* | CAT | Civ Pvt |
| *Alt/FL:* | 2200ft↓ | <2000ft |
| | QNH (1015mb) | QNH (1015mb) |
| *Weather* | VMC NR | VMC NK |
| *Visibility:* | 25km | NK |
| *Reported Separation:* | | |
| | 200ft V/1·5nm H | NK |
| *Recorded Separation:* | | |
| | 800ft V @ 0·8nm Min H | |




## PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

**THE DHC8D PILOT-IN-COMMAND**, the PNF, provided a very comprehensive account reporting that he was inbound to Southampton under IFR in VMC and handed over from London CONTROL to Southampton APPROACH (APR) on 120·225MHz routeing PEPIS to SAM in accordance with the SAM1F STAR. The expected approach was a VOR/DME to RW20 rather than the usual ILS due to grass cutting in progress on the airfield. He thought he was in receipt of a RIS.

Approaching from the N, the common procedure, remaining inside CAS, is to continue southbound towards SAM and at about 6d N of the airfield to be vectored into a descending LHD circuit to establish onto the LLZ or in this case the inbound radial.

Although traffic under the radar control of SOLENT appeared to be light - just themselves as No2 to another ac ahead of them on an approach – at 1·5d to the N they had still not received any vector instructions from ATC. They 'armed' the SAM hold beginning to suspect that the controller might be preoccupied. This seemed to be the case as a second controller stepped in and gave them their cross-wind turn onto E coupled with a descent instruction.

The flight ahead of them requested a visual approach, which was approved by the original controller, along with traffic information that a PA28 light aircraft (LA) was orbiting overhead Winchester at 2000ft. This information caused him some concern as the VOR/DME approach track is offset 12° R of the RW20 centre-line, by their estimation, directly overhead Winchester. After a quick discussion in which they confirmed the visual position of the traffic ahead, the airfield and the location of the orbiting LA, they agreed that a visual approach might well be the safest option. This took them a short time so they were about 5nm downwind when they requested a Visual Approach – he believed that their altitude was about 3500ft. Approval was given by SOLENT for the Visual Approach and once again traffic information was given regarding the orbiting LA over Winchester so the PF immediately started a descent down to 2000ft at a good rate - putting them at worst at the base of CAS if they exceeded 8d.

At this moment the second controller stepped in again, telling them that the PA28 was not orbiting Winchester but was heading eastbound through the RW20 centre-line at 9nm. Heading 021° at 190kt downwind, he thought this placed the LA in the CTR close to their intended base-leg track flying in the opposite direction and they started searching for it. TCAS then showed the ac as proximate traffic and almost immediately as a TA with vertical separation reducing below 500ft as they closed on the ac. This traffic was displayed vertically separated by 200ft and just over 1nm ahead when he called to the PF to pull-up; ATC were informed of the manoeuvre. This was smoothly flown back up to about 2600ft with a L turn onto a base-leg clearing the TA. Neither he, nor the PF, saw the PA28 visually at all and a normal visual approach to landing followed.

The decisions that they made for the approach were designed to be safe and were based on situational awareness that was rapidly altered at a critical moment. He believes that their intended tracks were sufficiently different not to have led to a more serious incident but he stressed that they came uncomfortably close to another ac and hope all concerned might learn from the event.

**THE PA28 PILOT,** a Flight and RT Examiner, advised that after a 2 month absence from the UK whilst flying in the USA he did not feel able to complete a conventional report. Nonetheless, he provided as full an account as he could of this celebratory pleasure flight for a retiring member of a local College, based on his recollection and that of his passenger whom he consulted. He had taken many student pilots and guests over Winchester in the last 14 years, such flights always made possible by Southampton ATC for whom he has a high regard. He always observed whatever requirements they made of him during these flights which invariably involved a move on toward Portsmouth and the Solent before returning to Thruxton.

He recalls that the day in question was a good VFR day - maybe with haze at that time. Heading from Winchester, via New Alresford, is a good route he had flown many times before. He could recall nothing untoward and would have carried out all the requisite RT exchanges/compliances. Unaware of any problem with the flight that he could recall after the intervening period of 2 months, he cannot recall any situation where there was any risk of collision. Had such been the case he would have been talking to Southampton ATC and the operator on his return.

He was sorry that he was unable to respond with any greater detail. However, when the facts were determined, he is keen to know what happened and what lessons can be learnt.

**THE COMBINED SOLENT RADAR & SOUTHAMPTON APPROACH CONTROLLER (APR)** reports that he was mentor to a trainee. The PA28 had left Winchester northbound below 2000ft QNH under VFR squawking A3666 but no Mode C was displayed. Once N of the CTR boundary the pilot turned eastbound towards New Alresford and was in receipt of a FIS on 120·225MHz. The DHC8 was inbound IFR, downwind L for RW20 at 3000ft QNH (1015mb) under a RCS squawking A1460 with Mode C. The DHC8 pilot reported visual with the airport and was given traffic information on the PA28. His trainee had told the DHC8 crew that the PA28 was at Winchester orbiting below 2000ft QNH so he corrected the traffic information and advised the DHC8 crew that the PA28 was actually at 9nm Finals routeing eastbound below 2000ft QNH. The DHC8 crew acknowledged this; he then told the PA28 pilot about the DHC8 making a Visual Approach, the pilot saying that he had the airliner in sight and was clear. He believed he then updated the position of the traffic at which point the DHC8 pilot said he had the PA28 in sight, he thought, and was climbing. [UKAB Note: The DHC8 crew never saw the PA28 visually, it was only displayed to them on TCAS.] By this stage the DHC8 had descended to 2200ft indicated Mode C of his own accord and not in response to a TCAS RA, which he acknowledged. The DHC8 then continued the approach without further incident.

After landing the DHC8 p-i-c spoke to him by telephone about the approach and said it was the closest he had ever been [to another ac] and he would have to file an Airprox report because of this.

**ATSI** reports that the controller – the APR - was operating the combined Southampton APPROACH (APR) and Solent RADAR positions. He was monitoring a trainee, who had completed approximately one third of the average time taken to receive a Certificate of Competence for Approach Control at Southampton. The APR described his workload as *"light"*.

The PA28 pilot was on a local VFR flight from Thruxton, had been cleared to operate VFR, not above 2000ft QNH (1015mb), within the Southampton CTR over Winchester, which is situated close to the northern boundary of the Zone. The DHC8 crew, inbound on Airway R41, established communication with Solent APPROACH at 1626, descending to FL80 flying towards PEPIS. Shortly afterwards, the flight was instructed to descend to 6000ft QNH (1015mb) and, 1min later, to descend to 5000ft to enter the Solent CTA (Class D CAS - upper limit FL55).

After being advised of an inbound ac that was ahead of the DHC8, the PA28 pilot reported at 1630:40, *"..we're looking for the traffic and just finishing up here now over Winchester.."*. The APR Mentor, who was temporarily making the RT transmissions, replied to the PA28 pilot *"Roger once finished if you can route north initially..by about 2 miles and then turn for New Alresford",* which was read-back. This was to route the PA28 out of CAS and away from the DHC8's approach. The DHC8 was by now just to the N of the airport and the APR then issued a L turn heading 090° at 1630:50, preparatory to turning it downwind left-hand for RW20, Number 2 in traffic. This is the usual method of vectoring ac from the N to RW20, to ensure they remain within CAS and this plan was then carried

out by the trainee who instructed the DHC8 crew, just after 1631:50, to turn L heading 020° followed later at 1632:30, by an instruction to descend to 3000ft QNH.

At 1633:20, whilst left-hand downwind about 5½nm NE of the airport, the pilot of the DHC8 reported visual with the airport and the traffic ahead (which was now on final approach at about 1½nm). The DHC8 pilot requested a visual approach to RW20. This was approved by the trainee controller at 1633:30 *"..cleared visual approach number two to that traffic. Traffic for you is a P A 28 orbiting at Winchester not above altitude 2 thousand feet VFR"*. The DHC8 pilot acknowledged the approach and the traffic information. The APR Mentor, being aware that the PA28 had moved from its position over Winchester, corrected the traffic information issued by his trainee to the DHC8 straight away and transmitted at 1633:50, *"the Cherokee's in fact just going through a 9 mile final eastbound 2 thousand feet VFR routeing away now"*. The radar photograph, timed at 1633:46, shows the DHC8 4·1nm SE of the PA28 and 900ft above it. The PA28 was tracking E at 2000ft, 9·2nm NE of the airport, now outside the Southampton CTR but at the base of the Solent CTA (2000ft-FL55).

The Mentor continued to make the ATC transmissions until after the Airprox occurred. Traffic information was issued to the PA28 pilot and updated to the DHC8 crew: *"traffic for you is a Dash-8 late downwind left hand 3 thousand feet 3 thousand feet* [sic] *descending now onto left base"*. The PA28 pilot reported at 1634:00, *"looking for traffic* [C/S] *visual with that traffic [*C/S] *no conflict we're just approach*[ing] *New Alresford"*. *"*[DHC8 C/S] *previously mentioned traffic's now northwest of you by 3 miles"*. The pilot responded just after 1634:10, *"we're just 2 hundred feet from that traffic about inside of 1 mile so we're just climbing again"*. Shortly afterwards the DHC8 pilot reported clear of the traffic.

The radar photographs show that the DHC8 had descended to 2100ft, when it was 2nm from the PA28. Thereafter, it climbed to 2400ft as it passed the PA28, by which time the latter had descended to 1400ft and the two flights were now 0·9nm apart. At the CPA of 0·8nm, when the vertical separation was 800ft, the two aircraft were approximately 9nm N of Southampton Airport. This placed the DHC8 just 300ft above the 2000ft base of the Solent CTA and the PA28 some 500ft below it. Although not considered to be a causal factor to the Airprox, the pilot of the PA28 pilot was not informed about the ATC service being provided when he left CAS, as is required by the MATS Part 1.

When the trainee cleared the DHC8 for a visual approach no descent restriction was placed on the flight. The MATS Part 1, Section 3, Chapter 2, Page 5 states:

*"When an aircraft is cleared for a visual approach the clearance must include, where appropriate, a descent restriction that will ensure that the aircraft remains within controlled airspace."*

The MATS Part 1 also states, Section 1, Chapter 6, Page 4,

*"Except when aircraft are leaving controlled airspace by descent, controllers should not normally allocate a level which provides less than 500 feet vertical separation above the base of a control area or airway. This will provide some vertical separation from aircraft operating beneath the base of controlled airspace".*

The Mentor commented that he assumed that the DHC8 would turn onto BASE-LEG sufficiently early to remain within the CTR, especially as the crew had been informed about the PA28 crossing the approach at 9nm range at 2000ft QNH. The APR agreed that an initial altitude restriction, of at least 2500ft, should have been issued on this occasion.

The UK AIP states the Noise Abatement Procedures for ac flying a visual approach to Southampton:

*"Aircraft flying a visual approach should not intercept the appropriate final approach track at a range less than 5 DME SAM, except that aircraft flying a visual approach via the downwind leg should not intercept final approach at less than 2 DME SAM for RW20. Aircraft flying a visual approach should intercept the final approach track at a level not less than the equivalent to a 3° glide path at the intercept range".*

The Mentor did not ensure that the DHC8 crew was issued with an appropriate descent restriction when his trainee cleared the flight for a Visual Approach to RW20. Consequently, maintenance of at least 500ft above the base of the CTA was not assured. However, traffic information was issued to both flights, albeit initially incorrectly to the

DHC8, but this was quickly addressed by the Mentor and the pilot informed, correctly, that the PA28 was in the vicinity of the final approach at 9nm at 2000ft.

## PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included a report from the pilot of the DHC8 and the PA28 pilot's best recollection; transcripts of the relevant RT frequency, radar video recordings, a report from the air traffic controller involved and a report from the appropriate ATC authority.

Whereas the IFR DHC8 pilot had reported he was under a RIS from Southampton APPROACH, this was not the case. The ATSI Advisor emphasised that even when executing a visual approach this flight was still considered technically to be IFR. Although self-positioning under their own navigation, the DHC8 crew were still under a RCS, the only form of radar service available to them within the confines of the Class D CTA. Despite this however, the responsibility for the separation of ac was perhaps not quite so self-evident as APR was only responsible for providing separation between IFR flights. Within Class D CAS no separation is offered between IFR and VFR flights – as the PA28 here – and avoidance advice is provided by ATC only if specifically asked for by the pilot. Thus, all APR was required to do was to pass traffic information about the VFR PA28 to the crew of the IFR DHC8, and vice versa, which was accomplished. However, the traffic information passed about the PA28 was, it seemed, the catalyst to this Airprox.

From the PA28 pilot's perspective he had been cleared to operate VFR, not above 2000ft QNH (1015mb), within the CTR over Winchester, close to the Zone boundary. When the PA28 pilot had finished his task, he was instructed by the APR Mentor to "…*route north initially..by about 2 miles and then turn for New Alresford",* thereby routeing out of the CTR over the northern boundary and away from the DHC8's approach. It was just under 3min later that the APR trainee cleared the DHC8 crew for the visual approach. Critically, the trainee also passed somewhat outdated traffic information to the DHC8 pilots at this point, *"..traffic for you is a P A 28 orbiting at Winchester not above altitude 2 thousand feet VFR"*. Aware that the PA28 had moved from its position over Winchester, this inaccurate traffic information was amended 20sec later by the Mentor himself, *"the Cherokee's in fact just going through a 9 mile final eastbound 2 thousand feet VFR routeing away now"*. The DHC8 pilot reported that he believed this placed the other aeroplane in CAS, close to their intended base-leg track, which it did - but legitimately so. Whilst this is indeed at the base of the CTA and the radar recording shows the PA28 at this altitude for a few sweeps [UKAB Note: the tolerance applicable to verified Mode C is +/- 200ft] it is also clear that the PA28 had subsequently exited the CTR, as cleared, toward New Alresford before the Mentor passed traffic information to the VFR PA28 pilot about the IFR DHC8. At this point the PA28 pilot reported visual contact with the DHC8 which was over 2½nm away and that there was *"…no conflict .."*. The Board recognised that the PA28 pilot had conformed to the instructions issued by APR; had fulfilled his responsibilities for the avoidance of IFR traffic reported to him and had descended clear of CAS into the Open FIR beneath the CTA where he was legitimately allowed to operate. The DHC8 crew should also have heard that the PA28 pilot was visual with their airliner as both were operating on the same frequency. However, it was apparent from the DHC8 pilot's account that when they were cleared for a visual approach the PF had immediately started a descent down to 2000ft "at a good rate". The radar recording reflected that this had indeed subsequently placed them at the 2000ft base of the Class D CTA at one point, as they turned continuously onto FINALS from about 9nm downwind with little sign of a BASE-LEG, passing the PA28 out to starboard as they did so. Controller Members believed that in this light workload scenario the APR Mentor should have recognised from his radar display that the DHC8 had transited this far downwind and was turning outwith the CTR, close to the base of the CTA and thereby potentially close to traffic outwith CAS. Significantly, the ATSI report had shown that in order to comply with national procedures a descent restriction should have been issued by APR to ensure that firstly the DHC8 remained wholly within CAS and secondly that this IFR flight remained 500ft above the base of the control area, thereby affording some vertical separation from traffic operating close beneath the base of the CTA. In the Board's view, this was part of the cause insofar as Southampton APPROACH did not place a descent restriction on the DHC8D to keep the ac within the CTA. If this had been accomplished then it might have allayed the DHC8 pilot's concerns and forestalled this Airprox.

A commercial pilot Member observed that the DHC8 crew was never at any stage in visual contact with the PA28. Their situational awareness was based initially on the traffic information received about the PA28 from the APR trainee, which consequently affected their visual approach profile; secondly on their displayed TCAS data and then lastly on the corrected traffic information from the APR Mentor. Pilot Members cautioned against the use of TCAS azimuth data which is not particularly accurate in presenting the relative horizontal juxtaposition of ac and TCAS

should not be used for traffic avoidance based on azimuth data alone. Therefore, before the last element of traffic information painted the truer picture, the DHC8 crew's situational awareness was based on at least one misleading position report, from the trainee. Nevertheless, whilst the DHC8 crew might have considered there had been a significant shift in position of the PA28, the altitude elements of these reports were right at the time. So despite being told that the PA28 was operating firstly not above 2000ft and then at 2000ft, the DHC8 crew succeeded in descending their ac to that altitude outside the lateral confines of the CTR boundary right to the base of the CTA before reversing the descent and climbing away from the light ac. It seemed to some CAT pilot Members that the DHC8 had descended into conflict with the PA28, which the crew had not seen. However, others stressed that the crew were conducting their own navigation whilst completing the visual approach and were aware from the traffic information that the light ac was in the vicinity at 2000ft. Weighing all these various factors for relevance, the Board concluded that the other part of the cause of this Airprox was that whilst on a visual approach and despite traffic information, the DHC8D crew descended towards the level of the PA28.

Turning to the inherent Risk, as the Mentor saw this situation unfold on his radar display as the DHC8 descended down toward the base of the CTA it is unfortunate that he had not intervened. The pilot of the PA28, who by then was outside the CTA in Class G airspace, had spotted the DHC8 at least 2½nm away and promptly elected to descend to increase vertical separation from the airliner. Although they did not spot the PA28 visually, at about the same time the DHC8 pilot-in-command wisely instructed his 1st Officer – the PF - to pull-up, thereby also increasing separation on the PA28, displayed to him on TCAS as they climbed back up in the CTA. The DHC8 pilot having acted of his own volition - no RA was enunciated by TCAS - at the point of minimum horizontal separation of 0·8nm, the combined effect of the DHC8's climb coupled with the PA28's descent had ensured that the airliner was 800ft above the light ac. Taking all these factors into account, the Board concluded that no risk of a collision had existed in the circumstances conscientiously reported here.

The NATS Ltd Advisor briefed the Board that as a result of this Airprox investigation, a supplementary instruction has been issued at Southampton ATC, highlighting to controllers the areas of concern within the ATSI report.

## PART C: ASSESSMENT OF CAUSE AND RISK

Cause: (i) Southampton APPROACH did not place a descent restriction on the DHC8D to keep the ac within CAS.

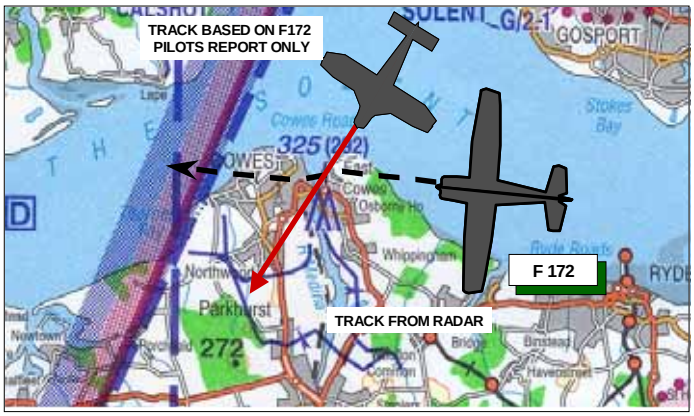
(ii) Whilst on a visual approach and despite traffic information, the DHC8D crew descended towards the level of the PA28.

Degree of Risk: C.

## AIRPROX REPORT No 089/08

## AIRPROX REPORT NO 089/08

| | | |
|---|---|---|
| *Date/Time:* | 24 Jun 1050 | |
| *Position:* | 5047N 00118W (N ABM COWES - IOW) | |
| *Airspace:* | London FIR | (Class: G) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | F172N | Single engine monoplane |
| *Operator:* | Civ Pte | N/K |
| *Alt/FL:* | 1900 (QNH 1016mb) | NR |
| *Weather* | VMC CAVOK | NR |
| *Visibility:* | >20km | NR |
| *Reported Separation:* | 100ft V/ 40m H | NR |
| *Recorded Separation:* | NR | |




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

**THE F172N PILOT** reports flying a private flight to Bournemouth in a blue and white ac with the beacon selected on and, at the time of the Airprox, squawking 7000 with Mode C. They had been in receipt of a FIS from Farnborough West LARS squawking 0433 but Farnborough terminated the service as they approached the Isle of Wight at 4400ft [from the NNE] on QNH 1016mbs and they were told to squawk 7000 and freecall Solent Radar who told them to standby and remain clear of Controlled Airspace. Since a Zone clearance seemed unlikely, they initiated a descent, levelling at 1900ft to pass under the Solent CTA [base 2000ft]. Solent Radar then said to contact Bournemouth LARS and remain clear of Controlled Airspace.

As they were over the water N abeam Cowes, heading 270° at 100kt, his passenger, who holds a valid PPL, saw a low wing monoplane 2/300ft away in their 5 o'clock slightly below them just as the other ac was taking evasive action. He went to full power to climb away and turned left to avoid the other ac, assessing the risk as medium.

UKAB Note (1): The recording of the Pease Pottage Radar shows the F172 clearly tracking W at 1700ft (QNH 1018), passing just to the N of Cowes. Although there are 2 other ac squawking 7000 with Mode C in the area, neither are in the F172N's 5 o'clock at any time and neither are ever within ½ nm of it. The closest passes from W to E about ½ nm to the S (overland) at the same altitude.

UKAB Note (2): Due to the discrepancy between the radar data and the pilot's report the Secretariat contacted the F172 pilot for clarification. He was certain that the other ac was a light single engined monoplane and that it had approached from their 5 o clock.

**ATSI** reports that they had nothing to add.

### PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the F172N pilot and a radar video recording.

The Board was briefed that the recording of the Pease Pottage radar showed no contacts whatsoever in the position and time of the reported incident and that nothing was seen in the area immediately around the F172N (within about 1nm) either before or after the reported time. It was pointed out, however, that a small or wood and fabric ac without SSR would probably not show in that area. Without any radar of other information to facilitate identification of an ac that could have been that seen by the passenger in the F172N, the investigation phase had to be terminated. The Board could only conclude that this had been a conflict with an untraced light ac.

Since the F172N pilot did not see the other ac himself (only his passenger) and no further information was available the Board was not able to determine the degree of risk.

## PART C: ASSESSMENT OF CAUSE AND RISK

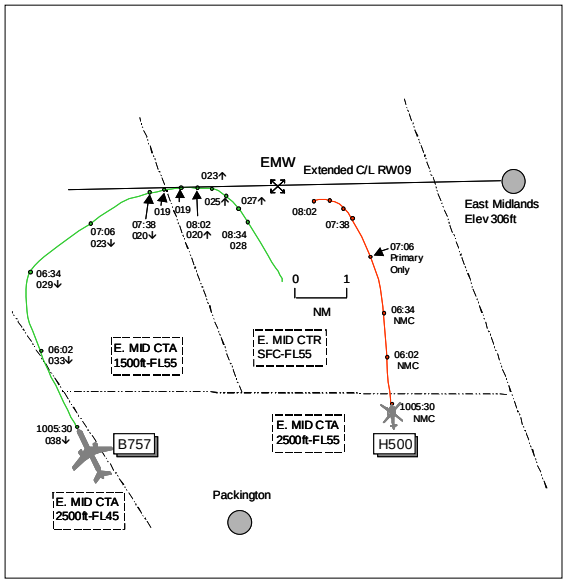
Cause: Conflict in Class G airspace with an untraced light ac.

Degree of Risk: D.

## AIRPROX REPORT No 091/08

## AIRPROX REPORT NO 091/08

| | | |
|---|---|---|
| *Date/Time:* | 24 Jun 1008 | |
| *Position:* | 5249N 00128W (5nm FIN APP RW09 East Midlands - elev 306ft) | |
| *Airspace:* | CTR | (Class: D) |
| | *Reporting Ac* | *Reported Ac* |
| *Type:* | B757-200 | H500 |
| *Operator:* | CAT | Civ Pte |
| *Alt/FL:* | 2000ft↓ (QNH 1018mb) | 700ft (QNH) |
| *Weather* | VMC CAVK | VMC CLBC |
| *Visibility:* | 25km | 10nm |
| *Reported Separation:* | NR | "Well above" |
| *Recorded Separation:* | NR | |




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

**THE B757 PILOT** reports inbound to East Midlands IFR and in receipt of a RCS from East Midlands squawking with Mode C. The visibility was 25km in CAVOK and the ac was coloured blue with strobe lights switched on. On establishing on the LLZ/DME-only approach for RW09 heading 091° at 145kt descending through 2000ft QNH and just prior to selecting flap 30°, they were given avoiding action by the radar controller owing to a helicopter infringing the CTR and not being in communication with ATC. A go-around was flown with a R turn onto heading 150° and climb to 3000ft and a second approach was flown to a landing. At no time did they see the other traffic and there was no TCAS return. On the second approach radar asked if they could see a helicopter in their 9 o'clock at 3nm low level but it was not visible. He assessed the risk as low.

**THE H500 PILOT** reports flying solo VFR between a private site near CPT VOR and another site near Northampton, not in communication with any ATSU. The visibility was 10nm flying well below cloud in VMC and the helicopter was coloured black; no lighting was mentioned. After departure enroute at 700ft QNH he realised that he was early so he decided to carry on 'up country' to build hours routeing to turn at Packington Airfield [8·5nm SW East Midlands]. On nearing Packington heading NW'ly at 100kt, he could not see the actual airstrip and whilst searching he saw a large RW ahead, about 5nm to his NE. He immediately turned L to avoid and took up a W'ly track to find a safe place to land and evaluate his position on the ground. He found himself to the W of the EMW NDB and using a topographical map and GPS he established his position as being outside CAS. He took-off and routed back to Northampton remaining outside CAS at all times for the duration of that flight leg.

UKAB Note (1): The H500 pilot was contacted post incident to discuss the geometry of the incident. He recalled that when turning W'ly away from East Midlands, he descended low-level and saw the B757 which went around and passed well above and to his R.

**THE EAST MIDLANDS APR** reports a primary contact was observed on radar about to cross the flight path of the B757. Being unknown, avoiding action was given (R 150° climb 3000ft) to take the B757 behind the primary contact. The B757 was re-vectored for a further (successful) approach. The primary-only contact was seen to turn W and the return suggested that it was low level. The ADC saw the infringing ac as possibly a black (or very dark in colour) EC135/Squirrel/Eurocopter type.

UKAB Note (1): Met Office archive data shows the East Midlands METAR as EGNX 0950Z 0606KT 010V110 9999 FEW030 17/10 Q1018=

**ATSI** reports that the incident took place approximately 5nm WSW of East Midlands Airport, in Class D CAS of the East Midlands CTR. It occurred in that part of the CTR, identified as CTR-2, which extends vertically from the SFC to FL55.

The B757 was inbound to East Midlands IFR and established communications with East Midlands Approach at 0957:30. The pilot reported copying ATIS Information 'Foxtrot', descending to FL80 and heading N. The APR informed the flight that the QNH was 1018mb and radar vectors would be provided to an ILS LLZ only approach to RW09.

Over the course of the next few minutes the B757 was issued with descent clearances and radar headings to position it RH downwind to RW 09. By 1006, the B757 was about 10nm SW of the airport and had just been cleared to descend to 2000ft QNH and turn R heading 060° to establish on the LLZ. The Clee Hill radar recording also shows an unknown target (the H500), squawking 7000 with NMC, on a consistent N'ly track, which had just entered the CTR at its southern boundary. Occupied with other traffic, the APR did not initially detect the presence of the intruder, but it had been seen by the ADC on his ATM. The ADC recalled, when asked during a telephone conversation, acquiring the unknown traffic visually when it had reached about 2nm inside the boundary and at this time notified the APR that it was a helicopter maintaining approximately 1000ft agl (Note airfield elevation is 306ft). By 1007:05, the helicopter's SSR label is no longer being displayed, leaving only a primary radar contact.

At 1007:18, the pilot of the B757 reported established on the LLZ and was instructed to continue approach. Up to this point, the unknown traffic had continued on the same track, but over the next 2 sweeps of the radar, a track adjustment of 20° L can be detected on the recording. By this time the aircraft's position was about 1nm S of the RW C/L. The APR then assessed the threat of the intruder and, anticipating that it may continue on a NNW'ly track, elected to break-off the B757 to the S and vector it behind the intruder. Hence, at 1007:40, the APR transmitted *"(B757 c/s) traffic right one o'clock range of four miles no height no level break-off the approach climb altitude 3000 feet turn right heading one five zero degrees avoiding action"*, which was read back correctly. (Note: 3000ft is the normal go-around altitude) The Unit report explains that mid-transmission, the APR had noticed the unknown traffic turn W towards the B757 and so had added the words 'avoiding action' to convey the sense of urgency now required. The ADC had also witnessed the helicopter turn W and descend to, what he estimated to be '500ft agl or below'. Not surprisingly, therefore, a few seconds later, the primary return of the helicopter disappears from the Clee Hill recording, though, according to the Unit report, it remained captured on the local airfield radar for several minutes more. The last radar sweep before the primary return of the helicopter drops out of cover on the Clee Hill, occurs at 1008:02, at which point the B757 is still on the final approach C/L with the helicopter in its 12:30 position, range 2·3nm, having just commenced the turn W. The B757's Mode C is indicating FL020 (approximately 2150ft altitude QNH 1018mb) climbing.

The B757 is passing FL023 Mode C (2450ft alt) when a turn to the R is detected on the radar recording. After the initial instructions to break-off the approach, no further TI was provided to the B757 by the APR. This is disappointing; as radar derived data and sighting reports from the ADC were both available and could have helped the pilot to assess more accurately the risk posed to his ac by the helicopter.

MATS Part 1, Section 1, Chapter 5, Page 15, Paragraph 15.2, describes the action to be taken by controllers when they observe an unknown ac, which they consider to be in unsafe proximity to traffic under their control in various types of airspace. For Class A, C and D airspace it states *"If radar derived, or other information, indicates that an aircraft is making an unauthorised penetration of the airspace, is lost, or has experienced radio failure – avoiding action shall be given and traffic information shall be passed."* Paragraph 15.3, on the same page, adds further relevant guidance *"When avoiding action is issued to an aircraft under a Radar Control Service, controllers must seek to achieve the required minima and pilots must comply with the instructions given. In these circumstances, pilots must comply with avoiding action even if they report visual with the other aircraft."* The required minima referred to were 5nm horizontally or 5000ft vertically, however, a vertical solution would not have been practical. The action taken by the APR was in the spirit of the MATS 1 guidance, but was not going to achieve 5nm minimum required, even if the helicopter had continued on its newly adopted NNW'ly track. In the end, taking into account all the information available, vertical separation between the two ac was most likely in the order of 2000ft at their closest point, which, after interpolation is estimated to have been less than 0·5nm laterally.

## AIRPROX REPORT No 091/08

### PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Pilot Members were not surprised that this incident had occurred considering the H500 pilot's actions. Once airborne he had changed his intended plan and flown an extended route, apparently without any planning beforehand. It was only after realising that his air picture was not quite right, when his turning point at Packington did not materialise and then seeing a large airport close to his track, that he had turned away and landed to establish his position by using a GPS receiver. However, during this flight phase, the H500 pilot had entered the East Midlands CTR without clearance and this had caused the Airprox.

Members wondered why the pilot had not used this GPS equipment earlier as it would have assisted with his navigation, particularly during the unplanned portion of the flight 'up country'.

It was noted that the H500 was only displaying Mode A with NMC before fading completely as the pilot manoeuvred away from East Midlands. Members reiterated the importance of squawking Modes A and C, when fitted, to ensure that ATC conflict alert systems and ACAS 'safety nets' are able to function fully.

Turning to risk, the APR had been alerted to the H500's presence by the ADC and had given the B757 crew a 'go-around' with a R turn to pass behind it, assuming that the helicopter would continue NW'ly. However, the H500 pilot's turn onto a W'ly track had reduced lateral separation but the ensuing descent to low-level had alleviated the situation in the vertical plane. The H500 pilot had seen the B757 passing well clear above during the latter's 'missed approach'. These actions taken by all parties when combined with the geometry that pertained were enough to allow the Board to conclude that any risk of collision had been effectively removed.

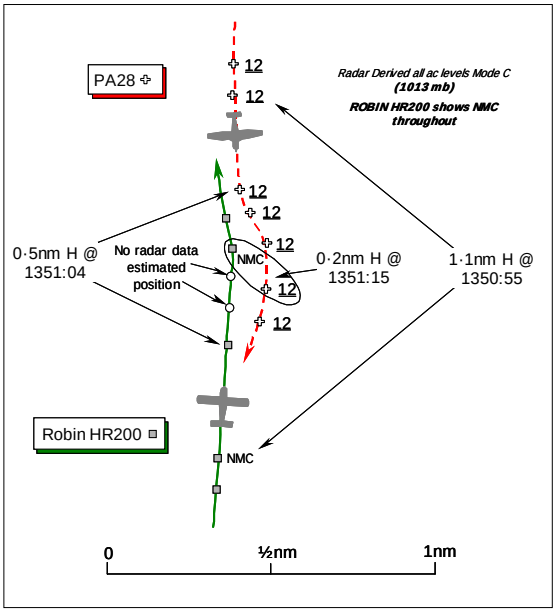
### PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The H500 pilot entered the East Midlands CTR without clearance.

Degree of Risk: C.

# AIRPAIRPROX REPORT NO 092/08

| | | |
|---|---|---|
| *Date/Time:* | 28 Jun 1351 (Saturday) | |
| *Position:* | 5315N 00233W (4½nm NE of WHITEGATE) | |
| *Airspace:* | Manchester L-L Route | (Class: D) |
| | Reporting Ac | Reported Ac |
| *Type:* | Robin HR200 | PA28-181 Archer |
| *Operator:* | Civ Pte | Civ Pte |
| *Alt/FL:* | 1200ft | 1250ft |
| | QNH (1015mb) | QNH |
| *Weather* | VMC CLBC | VMC Good VFR |
| *Visibility:* | >10km | 20km |
| *Reported Separation:* | | |
| | Nil V/200yd H | nil V/1200m H |
| *Recorded Separation:* | | |
| | ~300yd H | |




## PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

**THE ROBIN HR200 PILOT** reports he had departed from Sywell and was flying N in the Manchester Special Low-Level Route (MLLR) inbound to Manchester (Barton) and in receipt of a FIS from Manchester RADAR on 118·575MHz, squawking A7000 with Mode C selected on.

Operating VFR in VMC, in a level cruise at 1200ft QNH (1015mb) heading 358° at 95kt, his passenger (a PPL holder) was the first to sight and alert him to conflicting traffic about 0·8nm away. The other ac – a white low-wing single engined monoplane - was spotted by himself at a range of about 0·4nm, travelling S at the same altitude, on a reciprocal track, virtually head on but very slightly to his R.

To avoid the other ac he immediately turned L as a R turn would have increased the conflict. The pilot of the other ac also turned L just as he turned and they passed starboard to starboard at the same level, less then 300ft apart with a *"high"* risk of a collision.

He added that the controller was very busy handling commercial arrivals into Manchester.

**THE PA28-181 ARCHER PILOT** reports he had departed Manchester (Barton) bound for Peterborough (Conington) in good VFR conditions. They were flying in the Manchester Special Low-Level Route, with which they were very familiar, squawking A7366 [adjacent to CTR Conspicuity] with Mode C on and *"listening out"* on the appropriate Manchester ATC frequency of 118·575MHz. He thought he was in receipt of a FIS. [UKAB Note (1): The ATSI report makes it plain that although the PA28 pilot had been listening out on 118·575MHz, he had neither contacted Manchester ATC nor requested an ATS whilst in transit through the MLLR.]

Heading S at 100kt in a level cruise at the required altitude of 1250ft Manchester QNH, the MLLR was quite busy and they were keeping a sharp lookout. Over Northwich, they spotted another ac with a high-wing, he thought, [but actually the Robin HR200] some 1500m away flying in the opposite direction at the same altitude, already turning away. He therefore turned in the opposite direction, away from the ac to maximise the horizontal separation. The two ac passed each other about 1200m apart with a *"medium"* risk of a collision.

He added that, ideally, they would like to have spotted the other ac slightly earlier and turned away sooner – the Robin pilot spotted his PA28 before they spotted the Robin he opined – but he considered this was as a result of the background from which the Robin emerged which made it slightly more difficult to spot his ac. Neither he nor his colleague (also a pilot) considered this to be a particularly unusual or alarming occurrence in the MLLR, which is quite narrow so visual contact with other ac at busy times is not unusual. At no time were they contacted by

Manchester RADAR to warn of conflicting traffic, so they assumed ATC did not consider the potential conflict as serious.

He opined that all ac can fly where they wish within the MLLR, all at the same altitude. He suggested that there is merit in considering a rule whereby northbound ac would use the eastern side of the Route and southbound use the western side, which would reduce the potential for conflictions.

He added that his ac is coloured Blue & White and the HISLs were on.

UKAB Note (2): The Manchester Special Low-Level Route (MLLR) is situated within the Class D Manchester CTR, 4nm wide, running N - S in between Manchester and Liverpool Airports. Flight procedures are within the UK AIP at AD 2-EGCC-1-19. Within the MLLR helicopters or aeroplanes may fly without individual ATC clearance subject to:

i) They remain clear of cloud and in sight of the ground;

ii) maximum altitude of 1250ft, Manchester QNH (available from ATIS);

iii) minimum flight visibility 4km. Flights using the Low Level Route are responsible for their own separation from all other flights when operating within the Low Level Route airspace at all times.

Pilots flying within 5nm of Manchester CTR and maintaining a listening watch only on the Manchester Approach frequency may select code A7366 in order to alert ATC to their presence. Pilots squawking 7366 will receive no ATC service. This does not affect normal FIS procedures. Aircraft displaying the code are not expected to contact ATC under normal circumstances, remain responsible for their own navigation, separation, terrain clearance and are expected to remain clear of the Manchester CTR at all times. When an aircraft ceases to maintain a listening watch or is no longer flying within 5nm of the Manchester CTR, the pilot will deselect transponder code 7366.

UKAB Note (3): Analysis of the St Annes and Clee Hill radar recordings shows the Robin HR200 northbound within the confines of the MLLR but no Mode C is displayed at all throughout the encounter. The PA28 is shown southbound maintaining 1200ft (1013mb) and head-on to the Robin at a range of 1·1nm at 1350:55. The two ac close to a range of 0·5nm at 1351:04, which is probably just before the Robin pilot sighted the PA28, but thereafter contact on the Robin is lost for two sweeps. Thus neither the CPA nor the vertical separation can be determined independently. Thereafter the PA28 turns sharply L as does the Robin, in conformity with the avoiding action turns reported in both pilots' accounts. The Robin is shown again after turning L at 1351:15 after the two aeroplanes have passed abeam one another starboard to starboard. The range at this point is 0·2nm – broadly 400yd – suggesting that horizontal separation was no more than this, and by interpolation more probably in the order of 300yd at the CPA which occurred about 4nm N of the southern boundary of the CTR.

**ATSI** reports that the Airprox took place at 1351 abeam Northwich, in the southern part of the Manchester Control Zone Special Low Level Route, which lies at the western boundary of the CTR, Class D Controlled Airspace.

Some 23min before the incident, at 1328, the Robin HR-200 pilot established communications with Manchester APPROACH, reporting en-route from Sywell to Manchester Barton aerodrome at 2500ft QNH, requesting a FIS. The Manchester APR agreed to provide a FIS, issued the QNH - 1015mb - and asked the pilot to report entering the Low Level Route. The QNH was readback correctly and the request acknowledged. No discrete SSR code was issued. The Manchester APR's primary responsibility is the control of IFR flights inbound to Manchester. Other responsibilities include the provision of an ATS to VFR and SVFR traffic operating within Manchester APPROACH's airspace and, where workload permits, a service to VFR traffic in adjacent areas outside CAS.

The MATS Part1, Section 1, Chapter 1, Page 2, Paragraph 6, **Flight Information Service** states:

"A FIS is a service provided without the use of ATS surveillance systems, either separately or in conjunction with other services, for the purposes of supplying information useful for the safe and efficient conduct of flights. Under a FIS the following conditions apply:

Provision of the service includes information about weather, changes of serviceability of facilities, conditions at aerodromes and any other information pertinent to safety;

A controller may attempt to identify a flight for monitoring and co-ordination purposes only. Such identification does not imply that an ATS surveillance service is being provided or that the controller will continuously monitor the flight. Pilots must be left in no doubt that they are not receiving such a service;

Controllers are not responsible for separating or sequencing aircraft.

In addition to the above, controllers will, subject to workload, provide pilots with information concerning collision hazards to aircraft operating in Class C, D, E, F or G airspace when self evident information from any source indicates that a risk of collision may exist. It is accepted that this information may be incomplete and the controller cannot assume responsibility for its issuance at all times or for its accuracy."

At 1342, following the issue of traffic information on a flight believed to be in the vicinity, the APR again requested the Robin pilot to report when he entered the Low Level Route, adding that when it was in the 'Route *"…its not above 1-2-5-0 feet on QNH 1-0-1-5",* and this was readback. At 1348, the Robin pilot reported entering the Low Level Route, to which the APR responded *"…report when you wish to leave my frequency."* No further communications took place between the Robin pilot and the APR until 1356:20, when the pilot reported that he would soon be turning R for Barton and changing frequency, which was acknowledged. The RTF recording shows that, during this intervening period, the Manchester APR was engaged with the handling of several IFR flights inbound to Manchester. The recording also shows no evidence of the pilot of the other ac involved – the PA28 - establishing communications with Manchester Approach. In the Manchester APR's written report he states only that he was *"…unaware of any incident, nothing was observed on Radar or reported on the RTF."*

It is assessed that there are no apparent ATC causal factors in this Airprox.

UKAB Note (4): A number of Airprox have occurred in the VFR 'see and avoid' environment of the Manchester Special Low-Level Route. Airprox 136/06 - occurring on 22 Aug 06 and involving a PA38 and a C172 – resulted in a UKAB Safety Recommendation that: *The CAA should review the procedures applicable to flight in the Manchester Special Low Level Route…..* This Safety Recommendation was accepted by the CAA who undertook to conduct a review of the airspace and associated procedures applicable to the Manchester Special Low-Level Route to be complete by the end of July 2007. However, work extended into December 2007 whereupon it was reported that changes to the Manchester Special Low-Level Route procedures had been incorporated into an Airspace Change Proposal (ACP) currently being developed by NATS Manchester that includes changes to the Manchester CTR. As an interim measure, Manchester ATC reviewed and revised Low-Level Route related Visual Reference Points (VRPs) in advance of the ACP. The purpose of the revised VRPs is to enhance visual referencing in relation to the adjacent portions of the Manchester and Liverpool CTRs. The ACP consultation was launched on 31st Oct 2008 which includes a proposal to raise the upper limit of the MLLR to 1300ft amsl and change the classification to Class G airspace. Further consultation with DAP revealed that:

Additional Visual Reference Points were established earlier this year to help better demarcate the lateral boundaries of the MLLR and the CTR boundaries.

Manchester ATC and Liverpool ATC continue to engage with one another over MLLR procedure matters.

## 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 a report from the appropriate ATC authority.

It was clear that the MLLR is Class D airspace where, unusually, neither an ATS nor contact with ATC is mandated: in this VFR environment, 'see and avoid' therefore prevails as the only means of traffic separation. Members recognised that the nub of this Airprox was the prompt sighting of the other ac which, when flying a reciprocal course, would be of small cross-sectional area. Flying head-on, the pilots of the two ac will have little relative motion to draw their attention to each other's presence. Here the reporting Robin pilot had not spotted the PA28 until his colleague indicated its presence whereupon he spotted it himself about 0·4nm away, immediately turning L to avoid it. From the other cockpit, the PA28 pilot had not spotted the northbound Robin until the latter's pilot was already turning L and it was probably this sharp turn which would have attracted the PA28 pilot's attention. The Board concluded unanimously that this Airprox had resulted from a late sighting by both pilots, each being equally responsible in this situation for sighting and avoiding each other's ac.

Whereas the Robin pilot was in receipt of a FIS from Manchester ATC, it was clear from the ATSI report that under this form of ATS pilots should not routinely expect to be provided with information concerning collision hazards or traffic information. The Manchester controller's first concern will be to traffic inbound to or outbound from the Airport, not traffic under a FIS which is not routinely accorded any priority. Moreover, controller Members were keen to point out that nor would ATC routinely broadcast to pilots who have not contacted them any collision hazard warning at all to those merely "listening out" on the frequency, as the PA28 pilot here. Significantly, even if the controller says nothing, this silence is certainly not tacit approval of the situation nor an indication of the seriousness of any encounter, as had been suggested here.

The PA28 pilot had highlighted the difficulties of spotting ac against the background landscape. GA Pilot Members agreed with this statement and attested to the difficulty of not being able to spot other ac, mainly because of the low transit altitude – mandated to be *not above* 1250ft, which is not the precise altitude at which to fly. This apparently resulted in a predominantly land/industrial background rather than a cloudscape which might highlight other ac more distinctly thereby making them easier to spot. Fortunately, here both pilots had sighted the other ac in time to take robust avoiding action. Although neither the CPA nor the vertical separation could be determined accurately, the radar recording had evinced the avoiding action turns reported in both pilots' accounts and suggested that horizontal separation was in the order of 300yd at the CPA as the two ac passed abeam and certainly closer than the 1200m suggested by the PA28 pilot. With this in mind, Members concluded that this was enough to remove the actual risk of a collision in the circumstances conscientiously reported here.

Another point, worth stressing here, was the absence of Mode C data from the Robin despite, according to the reporting pilot's account, it being switched on. Whilst not fundamental to how events unfolded here, pilots should be in no doubt as to the importance of Mode C data to safety overall, especially in the vicinity of commercial traffic in CAS. Mode C data received by other ac equipped with TCAS can certainly avert a collision and similarly assist ATC. The Board strongly encouraged all GA pilots to ensure that their Mode C was both serviceable and selected on throughout the flight where appropriate.

Turning to the point raised by the PA28 pilot about the possibility of a traffic separation scheme, GA pilot Members familiar with this Route also mentioned the difficulty of accurate visual navigation and the absence of distinctive line features upon which to follow the route accurately with the inherent danger of straying out of the MLLR further into the Liverpool or Manchester CTRs. The Board was briefed that NATS Ltd had produced a video guide to help pilots with this task. Background on the MLLR and previous Airprox occurring in this somewhat unusual but very constricted piece of airspace was discussed, together with the previous Safety Recommendation made by the Board. The DAP Advisor also emphasised to the Members that the ACP originated by Manchester ATC had been recently launched for consultation. Whilst it had been reported that MLLR associated VRPs had been revised, Members were conscious that additional or revised VRPs might not be the answer here. The Board recognised that the lack of suitable line-features through the MLLR, upon which any form of traffic separation scheme might be predicated, was a significant hurdle but it seemed to some Members that more could be done. However, a controller Member pointed out that even if a N-S separation scheme was feasible this would not counter conflicts with traffic crossing into and out of Barton - the importance of look-out being stressed once more. Whilst the ACP had only recently been issued, in this age of GPS assistance, even to motorists, GA pilot Members believed it should be feasible to formulate some form of traffic separation scheme – perhaps vertical or even temporal was mentioned. With much work already in hand, the Board was reluctant to make a further Safety Recommendation at this juncture.

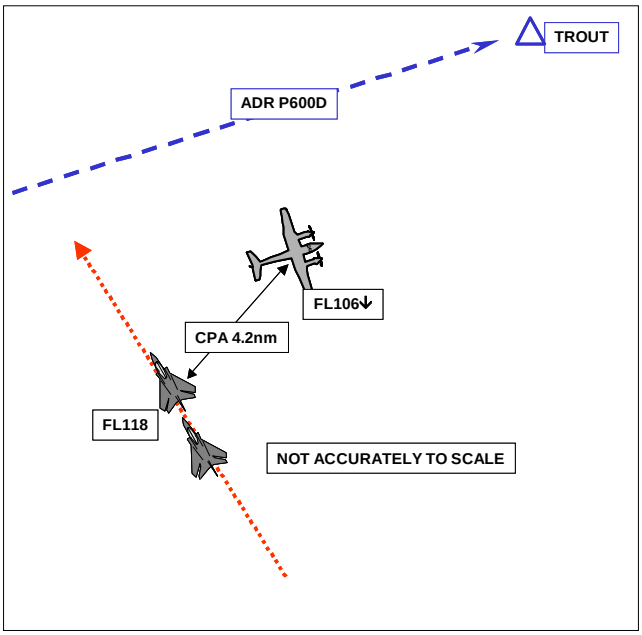
## PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Late sightings by both pilots.

Degree of Risk: C.

# AIRPROX REPORT NO 093/08

| | | |
|---|---|---|
| *Date/Time:* | 30 Jun 1424 | |
| *Position:* | 5730N 00124W (TROUT) | |
| *Airspace:* | P600D (See Note 1)(Class: F/G) | |
| *Reporter:* | Moray Sector Controller | |
| | 1st Ac | 2nd Ac |
| *Type:* | King Air B200 | Tornado GR4 |
| *Operator:* | Civ Com | HQ AIR (Ops) |
| *Alt/FL:* | ~FL110 | 11800ft (QNH 1009mb) |
| *Weather* | VMC NR | VMC CAVOK |
| *Visibility:* | NR | >50km |
| *Reported Separation:* | NR | 4000ft V/4-5nm H |
| *Recorded Separation:* | 1200ft V/4.2m H [See UKAB Note (1)] | |




## PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

**THE MORAY SECTOR CONTROLLER** reports that he was providing a RAS to a B200 outbound IFR from Aberdeen to Bergen on ADR P600D. The B200 was climbing to FL170 but was initially stopped off at FL115 and TI was passed regarding unknowns at FL125 converging. The unknown traffic then descended to FL111 and he passed an avoiding action descent to the B200, against the unknown military crossers which were about 10nm SE of position TROUT. Without this avoiding action, he considers that there would have been a serious risk of collision.

UKAB Note (1): The CPA of the Airprox occurred when the B200 was 4nm S of the centre line of P600D; the Tornado Leader was 7.2nm South of the centre line and the No2 8.4nm.

**THE KING AIR B200 PILOT** reports that after departure from Aberdeen he was cleared to TROUT climbing to FL170. When they were between FL110 and FL120 at 160kt, they were given TI regarding military ac in their proximity and subsequently an *"Immediate descent to FL100"* against the traffic. They disconnected the A/P and descended to FL100 but did not see the traffic and were not TCAS equipped.

**THE TORNADO GR4 PILOT** reports leading a 4-ship training fight participating in an exercise. Having completed one part of the exercise and when, at 1425, checking out from the AWACS that had been controlling them, he was told to 'lean' W away from a potential threat. He therefore manoeuvred the formation early so that they would cross P600D at ninety degrees and remain level (at an alt of 11800ft, on the exercise QNH of 1009), in accordance with published [UKAB Note (2)] guidance for crossing an ADR, en route RAF Lossiemouth.

[UKAB Note (2): As a result of previous discussions between civil ATC agencies and HQ STC (as was), in order to remain predictable, pilots of military ac are encouraged to cross ADRs at right angles and to fly at a constant level. Where possible, such pilots should obtain an ATC or Air Defence Radar service.]

The crew of the rear left ac visually acquired the civilian ac detailed above and assessed that no avoiding action was required. Therefore the leader assessed that the situation did not constitute an Airprox and the risk was none.

**ATSI** reports that a B200 was on an IFR flight from Aberdeen to Bergen. The ac established communication with the ScACC Moray Sector, at 1423, reporting routeing to TROUT, passing FL80 climbing to FL110. TROUT is situated on Airway P600 (FL195-FL245) and ADR P600D (FL90-FL190). The Moray Sector was manned by one controller who was carrying out both the Tactical and Planner functions: he described the workload as light to

moderate. The B200 pilot was instructed to continue heading 045° and was identified. The pilot was informed it was a RAS and instructed to climb to FL170. After receiving a readback to this transmission, the pilot was warned *"be advised there's a lot of military activity in your right hand at three o'clock range of one fife miles they're intermittent inside the Danger Area Six One Three Alpha but some of the aircraft may stray out of the Danger Area towards your position"*. About one minute later TI was passed as *"two fast moving jets right hand two o'clock range of ten miles Flight Level One Eight Flight Level One One Six converging stop your climb Flight Level One One Five acknowledge"* but the pilot did not acknowledge the message. The controller then continued *"[Callsign] descend immediately Flight Level One Hundred avoiding action"*. This action was acknowledged and the information was updated *"traffic right two o'clock range seven miles Flight Level One One Six converging and Flight Level One One Seven"*. The B200 pilot reported descending.

The radar recordings show that when the subject ac were at their closest, i.e. 4nm, the vertical separation was 1200ft; this occurred when the B200 was 9.5nm SW of TROUT. Previously, the separation had been 4.6nm/600ft and 4.2nm/1000ft.

UKAB Note (3): ATSI quoted separations taken from the NATS unit report. An analysis of the Aberdeen Radar recording (the same as being viewed by the controller) was subsequently conducted by the UKAB. The horizontal miss-distances calculated were slightly higher than those in the NATS unit report.

UKAB Note (4): The Aberdeen radar recording also shows that STCA did not activate.

The MATS Part 1, Section 1, Chapter 5, states:

*'Controllers shall pass avoiding action instructions to resolve a confliction with non-participating traffic and, wherever possible, shall seek to achieve separation which is not less then 5 nm or 3000 feet, except when specified otherwise by the CAA. However, it is recognised that in the event of the sudden appearance of unknown traffic, and when unknown traffic make unpredictable changes in flight path, it is not always possible to achieve these minima'.*

**HQ AIR OPS** comments that the formation leader arranged his crossing of the ADR iaw current teaching and passed behind the B200.

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

Members were briefed on the airspace nuances regarding ADRs but agreed that since these did not affect the circumstances of this incident, no comment was considered necessary. It was however agreed that the B200 was flying IFR; was technically on the ADR and was correctly being given a RAS by ScACC against all observed traffic. Further, the Moray Sector Controller had correctly complied with the provisions of a RAS and had, in the relatively short time available, given good TI and correct avoidance to the B200 pilot regarding the subject pair of Tornados.

Members also noted that before leaving the AWACS frequency on completion of their exercise, the Tornado formation had been warned of the civilian traffic in the ADR that would affect their recovery. The subject pair of Tornados had reacted to the warning by turning slightly to the W to ensure that they passed well behind the B200. This had been witnessed by the crew of the rear left Tornado, No 4, seeing the B200, reporting it to his leader who considered there to be no risk.

The Board concluded that due to timely action by the pilots and good and timely controlling of the B200 and the Tornados, there had been no conflict and therefore no risk of a collision.

## PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Controller perceived confliction.

Degree of Risk: C.