



UK AIRPROX BOARD

ISSN 1479-2729

Analysis of Airprox in UK Airspace

**Report Number 22
January 2009 - June 2009**

Twenty Second Report by the UK Airprox Board:

‘Analysis of Airprox in UK Airspace’

(January 2009 to June 2009)

produced jointly for

The Chairman,
Civil Aviation Authority

and the

Chief of Air Staff,
Royal Air Force

FOREWORD

The Airprox Board exists to enhance Flight Safety. By identifying the causes, risks, trends and lessons associated with Airprox, and communicating the results to the broadest possible audience across aviation, our aim is to minimise the possibility of repetition. This Report, "Book 22", is part of that communication effort. It contains detailed reports on the 60 Airprox that were reported as occurring in UK airspace from January to June 2009 and which were fully investigated by the UK Airprox Board. Its contents may be copied and reproduced as required by any persons to promote the lessons contained herein, provided their purpose is the promotion of Flight Safety.

The total of 60 Airprox for the first 6 months of 2009 is considerably lower than similar months in preceding years. Statistical and anecdotal evidence indicates that the economic recession has affected activity levels in the civil sector and the Airprox statistics show the biggest fall in the civil v civil Airprox categories. Provisional data for the whole of 2009 show that in the second half of the year the rate of Airprox was very close to the pre-recession average. During January to June 2009 a further 8 Airprox reports were withdrawn by the reporting pilots or controllers before the Airprox Board investigation was completed; this percentage of withdrawals is normal.

The table below shows that although the number of Airprox is lower than similar months in preceding years, the percentage of risk-bearing Airprox (Category A & B) is higher than the previous 5-year average. The reasons for this are unclear at the time of writing.

Risk Category	2004	2005	2006	2007	2008	2009	Previous 5-year average
A	8	13	4	3	5	2	7
B	30	26	20	21	21	23	24
C	66	53	54	51	57	33	56
D	5	0	0	0	4	2	2
Totals:	109	92	78	75	87	60	88
Risk Bearing %	35%	42%	31%	32%	30%	42%	34%

There are no significant changes to the predominant causes and contributory factors during the period. Late sightings and non-sightings are the most frequent causes. Gliders are particularly difficult to see and their presence at long distances from glider sites can surprise the unwary. Learning to understand how gliders operate in different weather conditions would enable pilots of powered aircraft to anticipate their likely routes. Furthermore, pilots of powered aircraft all too often fail to avoid glider sites by a sufficiently wide margin thereby risking collisions with the gliders, their tugs and winch cables. Another area in which it would be beneficial to learn about aircraft other than ones own is that of Collision Avoidance Systems and, specifically, TCAS. All pilots need to understand the way TCAS works and the reactions it can prompt if they are to avoid unnecessarily "spooking" TCAS-equipped aircraft. Another observation from many of the Reports, reinforced by the introduction of new Air Traffic Services Outside Controlled Airspace, is the need for pilots and controllers to ensure they both agree on the Service being provided. Finally, there continue to be too many penetrations of CAS/ATZ without clearance; in these circumstances, and for the vast majority of routine flying in UK airspace, squawking with Mode C is one of the most important things any pilot can do to ensure his own safety and the safety of others.

On a personal note, in writing my first Foreword as the new Director of the UK Airprox Board, I am indebted to my predecessor for the well-honed organisation and processes that have made the compilation of this Report so straightforward. All his former colleagues join me in wishing Peter Hunt a long and happy retirement.

Ian Dugmore

Director, UK Airprox Board

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INTRODUCTION

UK AIRPROX BOARD (UKAB) COMPOSITION

The UKAB is an independent organisation sponsored jointly by the CAA and the MOD to deal with all Airprox reported within UK airspace. There are eight civilian and six military voting Members on the Board which is 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:

- ó Air Traffic Terminal Control, Area Control and Airfield Control, military and civil;
- ó Commercial Air Transport (CAT) flying, both fixed and rotary wing;
- ó General Aviation (GA) flying, including gliding; and
- ó 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:

- ó Act as the start point for an investigation process into each incident, generally carried out the Safety Regulation Group (SRG) and the CAA and/or Military HQs;
- ó Determine what happened plus analyses of the main causal factors;
- ó Assess the risk levels involved;
- ó Make Safety Recommendations where appropriate to reduce the risk of incident recurrence; and
- ó 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 related 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 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 10 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

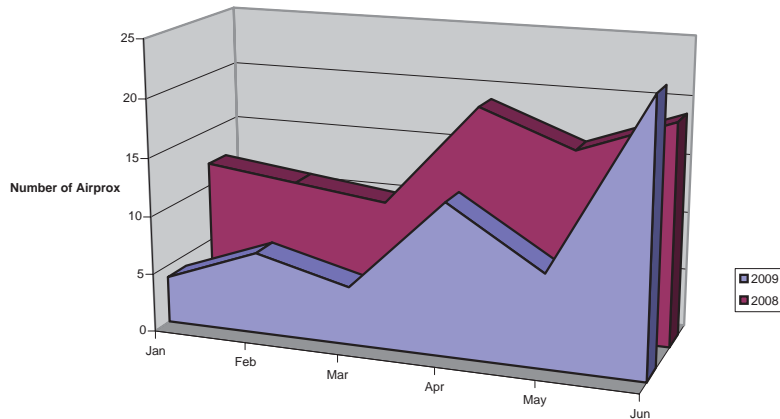
A key UKAB objective is to communicate effectively the lessons identified from Airprox events. Bi-annual 'hardcopy' Reports continue to be the primary means of communication, supported by presentations at flight safety meetings, cd-roms and the Internet. The UKAB Internet website is updated at least 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 2008 AND 2009

The small number of Airprox in any typical year (circa 180) makes statistical analysis vulnerable to exaggerating small changes and trends. This risk is exacerbated with reviews of shorter periods, and particularly for the first 6 months of 2009 with an abnormally low number of Airprox (60). Nevertheless, comparisons between January to June for 2008 and 2009 do provide some interesting results and, for those categories where the number of occurrences is similar to previous years, reliable comparisons are possible.

Figure 1 (Right) shows that the incidence of Airprox increases as the period progresses, but from a much lower start in 2009 than 2008.



Breaking down the Airprox into the 3 main user groups in Tables 1 & 2 and Figures 2 & 3 it can be seen that the total number of Airprox involving at least one military aircraft was almost the same, although the mix has changed with fewer Civ-Mil encounters and more Mil-Mil Airprox in 2009. The largest change, however, is the almost halving of the number of Civ-Civ Airprox in 2009 compared with 2008.

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 1

2009	Jan	Feb	Mar	Apr	May	Jun	Totals
Mil~Mil	1	3	2	2	0	7	15
Civ~Mil	1	1	0	3	2	6	13
Civ~Civ	2	3	3	8	6	7	29
Other	0	0	0	0	0	3	3
Totals	4	7	5	13	8	23	60

Table 2

User Group Mix: January - June 2008

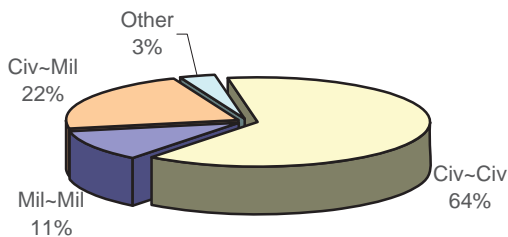


Figure 2

User Group Mix: January - June 2009

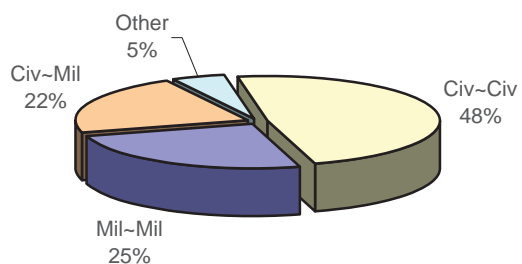


Figure 3

Further examination of the figures in Tables 1 & 2 provides more detail on how the user groups inter-acted with each other. Tables 3 & 4 show that the biggest change year-on-year was a reduction in Airprox involving CAT where there were falls against GA, Mil and CAT-CAT. GA aircraft were involved in fewer Airprox against all user groups with the reduction in GA-CAT providing the greatest proportionate change.

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
Total	87

Table 3

Mix details for 2009 (Jan-Jun):	
CAT~CAT	6
CAT~GA	5
GA~GA	18
CAT~Mil	3
GA~Mil	10
Mil~Mil	15
CAT~Unknown	0
GA~Unknown	1
Mil~Unknown	2
Total	60

Table 4

AIRSPACE IN WHICH THE AIRPROX TOOK PLACE - JANUARY TO JUNE 2009

Figure 4 shows the airspace classes within which the reporting aircraft was flying when the Airprox occurred. Unsurprisingly the majority of Airprox occur in Class G airspace (including ATZ, MATZ, LFA etc) although the percentage (82%) is higher than in previous years (64% in 2007 and 60% in 2008). There were increases in all the divisions of Class G airspace with the exception of those occurring in MATZ.

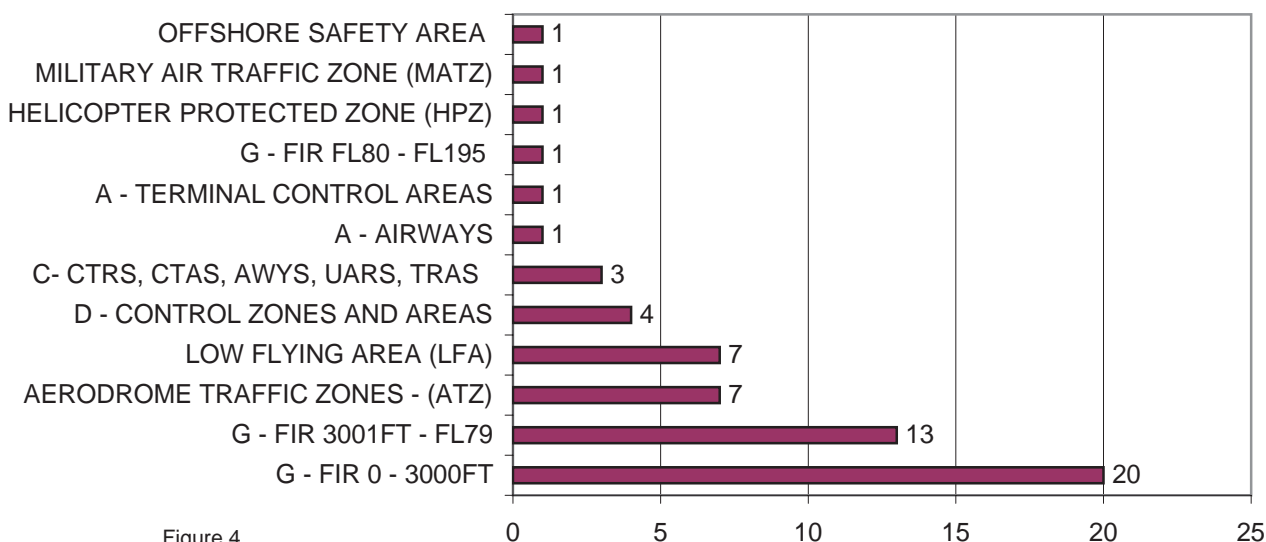


Figure 4

Of note, there has been a marked reduction in the number of Airprox in Terminal Control Areas (TCA) from 11 in 2008 to just 1 in 2009. Given that most Airprox in this category of airspace involve CAT, this reduction is particularly welcome. There has also been a reduction in Airprox in Class D airspace from 11 in 2007 to 4 in 2008. Of the 9 Airprox that occurred in Classes A, C & D during the period, all were assessed as Risk Category C. Conversely 5 of the 7 Airprox inside ATZs were assessed as Risk Category B.

COMMERCIAL AIR TRANSPORT (CAT)

Tables 5 & 6 show that the number of Airprox involving at least one CAT aircraft fell to less than half that in the corresponding period of the previous year but the risk profile remained broadly the same. There were no Risk Category A events, only one Category B event and the majority (87%) were Category C. Figures 5 & 6 show the distribution of events.

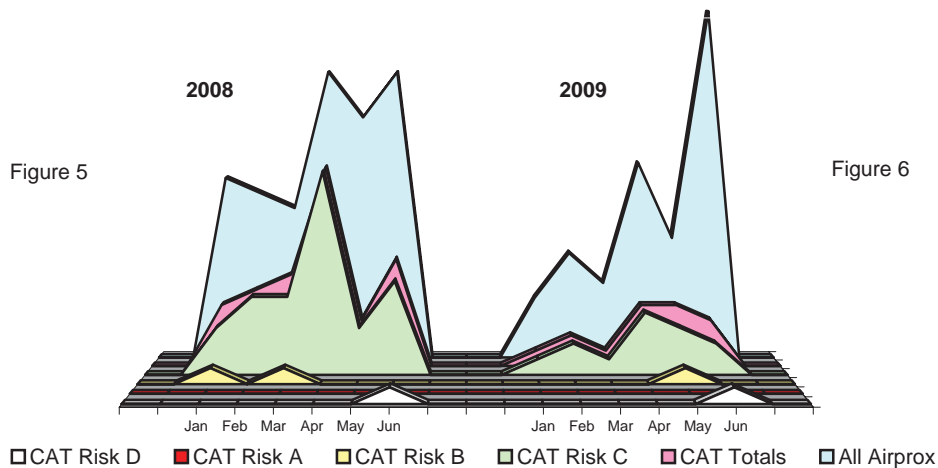
2008	Jan	Feb	Mar	Apr	May	Jun	Totals
Risk A	0	0	0	0	0	0	0
Risk B	1	0	1	0	0	0	2
Risk C	3	5	5	13	3	6	35
Risk D	0	0	0	0	0	1	1
Totals	4	5	6	13	3	7	38

Table 5

2009	Jan	Feb	Mar	Apr	May	Jun	Totals
Risk A	0	0	0	0	0	0	0
Risk B	0	0	0	0	1	0	1
Risk C	1	2	1	4	3	2	13
Risk D	0	0	0	0	0	1	1
Totals	1	2	1	4	4	3	15

Table 6

CAT Involvement in Airprox: January - June in 2008 and 2009



Turning to the causal factors, it should be borne in mind that an Airprox can have multiple causes. During January to June 2009, 12 different causes were assessed to have contributed to the 15 CAT Airprox events; the 7 most frequently assigned are listed in Table 7 together with the number of Airprox they were assigned against. The most prevalent cause (Did Not Separate/Poor Judgement) was also the most frequent cause in 2008. Two others from the 2009 “top 7” causes also featured the previous year: Inadequate Avoiding Action/Flew Too Close and Climbed/Descended Through Assigned Level. Of these, the latter was one of the 3 causes of the only Risk Category B event; the other causes were the Misinterpretation Of an ATC Message and an Undetected Read-back Error. For the rest, the variety of causes in such a small number of events precludes the identification of any significant trends.

Ser	Cause	Total	Attributed to.
1	DID NOT SEPARATE/POOR JUDGEMENT	4	CONTROLLER
2	INADEQUATE AVOIDING ACTION / FLEW TOO CLOSE	3	PILOT
3	FIR CONFLICT	2	OTHER
4	CLIMBED/DESCENDED THROUGH ASSIGNED LEVEL	2	PILOT
5	NOT OBEYING ORDERS/FOLLOWING ADVICE FROM ATC	2	PILOT
6	MISINTERPRETATION OF ATC MESSAGE	2	PILOT
7	PENETRATION OF CAS/SRZ/ATZ WITHOUT CLEARANCE	2	PILOT

Table 7

GENERAL AVIATION

Tables 8 and 9 show that within the overall reduction, from 56 to 34, in Airprox involving at least one GA aircraft the percentage of risk-bearing events (Category A and B) remained broadly the same: 35% up from 34%. Figures 7 & 8 show the distribution of events over the Jan-Jun period in 2008 and 2009.

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 8

2009	Jan	Feb	Mar	Apr	May	Jun	Totals
Risk A	0	0	0	0	0	1	1
Risk B	1	0	0	5	2	3	11
Risk C	1	2	2	4	2	10	21
Risk D	0	0	0	0	1	0	1
Totals	2	2	2	9	5	14	34

Table 9

GA Involvement in Airprox: January - June in 2008 and 2009

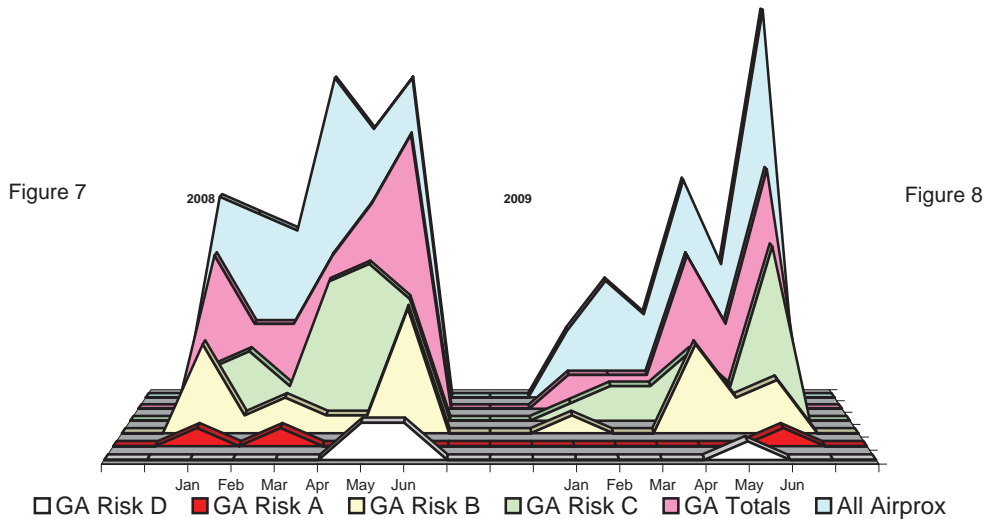


Figure 7

Figure 8

In the 56 GA Airprox in 2008, 31 different causal factors were assigned, whereas only 16 different causes were assigned in 2009. However, the 6 most frequent causes were very similar in both years with Late Sighting of Conflicting Traffic the most prevalent in both years (Table 10). These results underline the importance of good lookout and the difficulty of seeing small aircraft. The appearance of 'Penetration of CAS/ATZ Without Clearance' again in the list of most frequent causes continues to cause concern and highlights the importance of squawking with Mode C.

Ser.	Cause	Totals
1	LATE SIGHTING OF CONFLICTING TRAFFIC	10
2	INADEQUATE AVOIDING ACTION / FLEW TOO CLOSE	10
3	DID NOT SEE CONFLICTING TRAFFIC	8
4	PENETRATION OF CAS/ATZ WITHOUT CLEARANCE	4
5	SIGHTING REPORT	4
6	FIR CONFLICT	3

Table 10

MILITARY AVIATION

There were 30 Airprox involving at least one military aircraft during period Jan-Jun 2009; this was one more than in the corresponding months of 2008. Tables 11 & 12 show the breakdown of risk and Figures 9 & 10 show the distribution throughout the period. Of note is reduction in Risk Category A Airprox in 2009 but an increase in Category B occurrences.

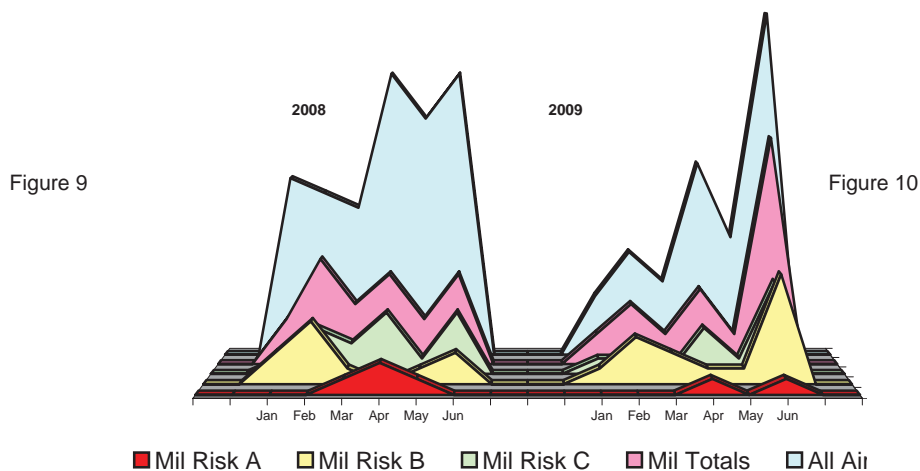
2008	Jan	Feb	Mar	Apr	May	Jun	Totals
Risk A	0	0	1	2	1	0	4
Risk B	2	4	1	0	1	2	10
Risk C	1	3	2	4	1	4	15
Risk D	0	0	0	0	0	0	0
Totals	3	7	4	6	3	6	29

Table 11

2009	Jan	Feb	Mar	Apr	May	Jun	Totals
Risk A	0	0	0	1	0	1	2
Risk B	1	3	2	1	1	7	15
Risk C	1	1	0	3	1	6	12
Risk D	0	0	0	0	0	1	1
Totals	2	4	2	5	2	15	30

Table 12

Military Involvement in Airprox: January - June in 2008 and 2009



Fourteen different causal factors were identified in the assessment of the 30 Airprox. With some of the Airprox having multiple causes, a total of 47 causes were assigned. Table 13 shows the distribution followed the pattern of 2008 with Late Sightings and Non-Sightings constituting the 2 most frequent causes. The spike in Airprox numbers in Jun 09 is not associated with any specific single cause; 5 were caused by non-sightings and/or late sightings, 5 were Conflicts in the LFS and the remainder were a mixed bag. Overall, with the exception of 'Conflict in Other Type of Airspace', all of the most frequent causes during Jan-Jun 2009 were in similar rankings in 2008.

Ser.	Cause	Totals
1	LATE SIGHTING OF CONFLICTING TRAFFIC	12
2	FAILURE TO SEE CONFLICTING TRAFFIC	9
3	FIR CONFLICT	7
4	INADEQUATE AVOIDING ACTION / FLEW TOO CLOSE	6
5	FAILURE TO SEPARATE/POOR JUDGEMENT	3
6	CONFLICT IN OTHER TYPE OF AIRSPACE	2

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.

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 7 May 2009.

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

UPDATE FEB 2010: The revisions were not included in AIRAC 10/2009 as the CAA investigation continues. There are ongoing discussions between the CAA and the air traffic service provider regarding the Gatwick SID.

STATUS – ACCEPTED – OPEN

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

Risk C

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

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

FURTHER ACTION: Relevant CAA and MOD documentation has been reviewed and adjusted as planned. CAP 413 (Radiotelephony Manual), is now the definitive, top-level, phraseology policy

document for UK civil and military aviation provision. MATS (Part 1), CAP 413 and JSP552 have been updated as planned and SI 2009/003 has been withdrawn. Therefore, a common approach to the procedure and phraseology to be used when it is necessary for VFR aircraft operating within Class D airspace to hold at a specific point of location is now in place.

STATUS – ACCEPTED – CLOSED

148/08 15 October 2008 involving an Airbus A321 and a pair of Typhoons Risk C

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

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

UPDATE FEB 2010: Overtaken by events; the TLP base was moved from Belgium to Spain in 2009. However, the review will have relevance to exercises other than the TLP.

STATUS – ACCEPTED – CLOSED

2009-059 21 June 2009 involving an ASK Glider and a Supermarine Spitfire Risk B

RECOMMENDATIONS:

- (i) That the MoD reviews the glider site symbology and the representation of ATZs on military LFCs and within associated Mission Planning Aids with the aim of improving their conspicuity and clarity.
- (ii) That the MoD reviews the co-ordination arrangements for UAA involving military ac, such as occurred here in regulated airspace, to ensure the safe de-confliction of UAA from other established but incompatible air activities.

ACTION: With DAATM

STATUS - OPEN

List of Abbreviations

aal	Above aerodrome level	CLBL	Clear Between Layers
ac	Aircraft	CLNC	Clear No Cloud
ACAS	Airborne Collision Avoidance System	CLOC	Clear of Cloud
ACC	Area Control Centre	CMATZ	Combined MATZ
ACN	Airspace Co-ordination Notice	CPA	Closest Point of Approach
A/D	Aerodrome	C/S	Callsign
ADC	Aerodrome Control(ler)	CTA	Control Area
ADR	Advisory Route	CTR/CTZ	Control Zone
AEF	Air Experience Flight	CWS	Collision Warning System
AEW	Airborne Early Warning	DA	Decision Altitude
AFIS(O)	Aerodrome Flight Information Service (Officer)	DAATM	Defence Airspace and Air Traffic Management
agl	Above Ground Level	DAP	Directorate of Airspace Policy CAA
AIAA	Area of Intense Aerial Activity	DF	Direction Finding (Finder)
AIC	Aeronautical Information Circular	DH	Decision Height
AIP	Aeronautical Information Publication	DME	Distance Measuring Equipment
AIS	Aeronautical Information Services	DS	Deconfliction Service
alt	Altitude	DUA	Dedicated User Area
amsl	Above mean sea level	E	East
ANSP	Air Navigation Service Provider	EAT	Expected Approach Time
AOB	Angle of Bank	elev	Elevation
A/P	Autopilot	ERS	En Route Supplement
APP	Approach Control(ler)	est	estimated
APR	Approach Radar Control(ler)	FAT	Final Approach Track
ARP	Aerodrome Reference Point	FIR	Flight Information Region
ASR	Airfield Surveillance Radar	FISO	Flight Information Service Officer
ATC	Air Traffic Control	FMS	Flight Management System
ATCC	Air Traffic Control Centre	FO	First Officer
ATCO	Air Traffic Control Officer	fpm	Feet per Minute
ATCRU	Air Traffic Control Radar Unit	fps	Flight Progress Strip
ATIS	Automatic Terminal Information Service	GAT	General Air Traffic
ATM	Aerodrome Traffic Monitor	GCA	Ground Controlled Approach
ATS (U)	Air Traffic Service (Unit)	GCI	Ground Controlled Interception
ATSA	Air Traffic Service Assistant	GMC	Ground Movement Controller
ATSOCAS	ATSs Outside Controlled Airspace	GP	Glide Path
ATSI	Air Traffic Services Investigations	GS	Groundspeed
ATZ	Aerodrome Traffic Zone	H	Horizontal
AWACS	Airborne Warning and Control System	HISL	High Intensity Strobe Light
AWR	Air Weapons Range	HLS	Helicopter Landing Site
BGA	British Gliding Association	HMR	Helicopter Main Route
BHPA	British Hang Gliding and Paragliding Association	HPZ	Helicopter Protected Zone
BINA ERS	British Isles/N Atlantic En Route Supplement	HQ Air	HQ Air Command
BMAA	British Microlight Aircraft Association	HUD	Head Up Display
BS	Basic Service	IAS	Indicated Air Speed
c	circa	iaw	In accordance with
CAA	Civil Aviation Authority	ICF	Initial Contact Frequency
CANP	Civil Air Notification Procedure	IFF	Identification Friend or Foe
CAS	Controlled Airspace	IFR	Instrument Flight Rules
CAT	Clear Air Turbulence	ILS	Instrument Landing System
CAVOK	Visibility, cloud and present weather better than prescribed values or conditions	IMC	Instrument Meteorological Conditions
cct	Circuit	JSP	Joint Services Publication
CFI	Chief Flying Instructor	KHz	Kilohertz
CLAC	Clear Above Cloud	kt	Knots
CLAH	Clear Above Haze	km	Kilometres
CLBC	Clear Below Cloud	L	Left
		LACC	London Area Control Centre (Swanwick)
		LARS	Lower Airspace Radar Service

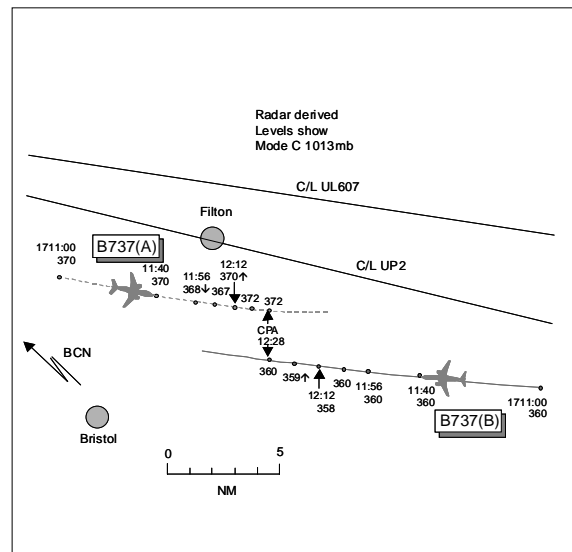
LATCC(Mil)	London Air Traffic Control Centre (Military)	SAP	Simulated Attack Profile
LFA	Low Flying Area	SAS	Standard Altimeter Setting
LFC	Low Flying Chart	ScATCC(Mil)	Scottish Air Traffic Control Centre (Military)
LH	Left Hand		
LLZ	Localizer	SACC	Scottish Area Control Centre (Pestwick)
LJAO	London Joint Area Organisation (Swanwick (Mil))	SFL	Selected Flight Level [Mode S]
LoA	Letter of Agreement	SID	Standard Instrument Departure
LTMA	London TMA	SKC	Sky Clear
MATS	Manual of Air Traffic Services	SMF	Separation Monitoring Function
MATZ	Military Aerodrome Traffic Zone	SOP	Standard Operating Procedures
mb	Millibars	SRA	Surveillance Radar Approach
MHz	Megahertz	SSR	Secondary Surveillance Radar
MOD	Ministry of Defence	STAR	Standard Instrument Arrival Route
MRSA	Mandatory Radar Service Area	STCA	Short Term Conflict Alert
MSD	Minimum Separation Distance	SVFR	Special VFR
N	North	TA	Traffic Advisory (TCAS)
NATS	National Air Traffic Services	TAS	True Air Speed
NDB	Non-Directional Beacon	TC	Terminal Control
nm	Nautical Miles	TCAS	Traffic Alert & Collision Avoidance System
NMC	No Mode C		
NK	Not Known	TRA	Temporary Restricted Area
NR	Not Recorded	TFR	Terrain Following Radar
NVG	Night Vision Goggles	TI	Traffic Information
OAC	Oceanic Area Control	TMA	Terminal Control Area
OACC	Oceanic Area Control Centre	TRUCE	Training in Unusual Circumstances and Emergencies
OAT	Operational Air Traffic		
O/H	Overhead	TS	Traffic Service
OJTI	On-the-Job Training Instructor	UAR	Upper Air Route
OOS	Out of Service	UHF	Ultra High Frequency
PAR	Precision Approach Radar	UIR	Upper Flight Information Region
PFL	Practice Forced Landing	UKDLFS	United Kingdom Day Low Flying System
PF	Pilot Flying		
PI	Practice Interception	UKNLFS	United Kingdom Night Low Flying System
PINS	Pipeline Inspection Notification System		
PNF	Pilot Non-flying	UNL	Unlimited
PS	Procedural Service	USAF(E)	United States Air Force (Europe)
QDM	Magnetic heading (zero wind)	UT	Under Training
QFE	Atmospheric pressure at aerodrome elevation	UTC	Co-ordinated Universal Time
QFI	Qualified Flying Instructor	V	Vertical
QHI	Qualified Helicopter Instructor	VCR	Visual Control Room
QNH	Altimeter sub-scale setting to obtain elevation when on the ground	VDF	Very High Frequency Direction Finder
		VFR	Visual Flight Rules
RH	Right Hand	VHF	Very High Frequency
RA	Resolution Advisory (TCAS)	VMC	Visual Meteorological Conditions
RAT	Restricted Area (Temporary)	VOR	Very High Frequency Omni Range
RCO	Range Control Officer	VRP	Visual Reporting Point
RH	Right Hand	W	West
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		

AIRPROX REPORT No 2009-001

AIRPROX REPORT NO 2009-001

Date/Time: TWIL 8 Jan 1712
Position: 5127N 00231W (32nm SE BCN)
Airspace: UAR UL607 (Class: C)
Reporting Ac Reported Ac
Type: B737-800(A) B737-800(B)
Operator: CAT CAT
Alt/FL: FL370↓ FL360

Weather IMC CLBL VMC NR
Visibility: 5000m NR
Reported Separation:
500ft V/NR H 800ft V/NR H
Recorded Separation:
1200ft V/2.3nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE B737(A) PILOT reports inbound to Stansted IFR and in receipt of a RCS from London squawking 7747 with Modes C and S. Cruising at FL370 heading 105° and 300kt they were cleared to 'descend when ready' to FL320 which they acknowledged and then further descent, when ready, to FL250 was given. Descent was started at the TOD (Top Of Descent) point and was reported to the controller. After a few seconds a TCAS TA then RA was activated with TCAS 'climb' on traffic seen about 15nm away on TCAS. They responded to the TCAS command and the controller advised them to climb immediately back to FL370 and to make a L turn heading N. The L turn was initiated and they returned to FL370 reporting 'clear of conflict'. At the time they were flying 1000ft above cloud in 5000m visibility and the other ac was not seen visually. Minimum vertical separation was seen on TCAS as 500ft and he assessed the risk as high.

THE B737(B) PILOT reports en route to the USA on course for STU at FL360 radar heading 280° at M0-79 and in communication with London ACC on 135-255MHz. They received a TCAS TA 'traffic' and then an RA 'descend'. The FO, PF, followed the TCAS guidance in accordance with SOPs. The traffic was crossing 800ft above and during the TCAS manoeuvre they descended about 120ft.

THE OFF-GOING LAC S6/8/9/35/36T reports clearing the B737(A) flight inbound to Stansted and to descend when ready from FL370 to FL340. He was then relieved from the position and he left the sector. On returning, he was informed that there had been a TCAS-resolved conflict between B737(A) and B737(B): the latter had been at FL360, S of its normal track.

THE ON-COMING LAC S6/8/9/35/36T reports when taking over the position B737(A) flight was already cleared to FL340 from FL370 as per the standing agreement from S35 to S5. He took control of the position and transferred B737(A) to S5. Although the fpps for the W'bound B737(B) were on the fps display, the ac was not yet displayed on his radar display, being E of his coverage. There was also another ac at FL360 which was presented to him on a parallel heading with B737(B) but the headings resulted in B737(B) being much further S than would normally be the case. A short while later he noticed B737(A) had still not left FL370 and was head-on to B737(B). He immediately told S5T to keep B737(A) at FL370: however, at this point B737(A) left FL370 and B737(B) flight reported a TCAS RA and descended 200ft. Although he turned B737(B) it did not take the turn as by then its pilot was responding to TCAS.

THE LAC S5/23T reports working in a banded configuration when B737(A) flight called level at FL370, cleared when ready to FL340 to expect FL180 by BEDEK; he acknowledged this call. In the next few minutes he amended the cleared level of B737(A) to FL320 and then FL250. At about 1712 S8/35T told him 'whatever you do don't let the 'B737(A) company name' leave FL370'. He noticed B737(B) indicating FL360 approximately 5nm ahead of B737(A), showing as a background track on his radar display. He instructed B737(A) flight 'B737(A) c/s maintain

FL370 acknowledge'. He did not receive a reply to this instruction but noticed the ac's Mode C indicate FL368. He immediately issued an avoiding action instruction to B737(A) flight to 'turn L immediately heading N'. Following a reply he gave TI regarding B737(B). B737(A) climbed up to FL372 and the crew reported 'clear of conflict', confirming that they had received a TCAS RA. Following this incident the B737(A) flight was cleared back on track with no further incident or comment about the event.

ATSI reports that the LAG W Sectors were being operated as S35, which was a combination of S6/8/9/35 and 36 and S5, which included S5 and 23 combined. The respective Tactical controllers were located next to each other. B737(A) was routeing from Kerry to Stansted, at FL370, on UAR UL607. B737(B) was on a flight from Zurich to Newark at FL360 and at the time of the Airprox was under S35's control.

At 1653, the S35P agreed with the S1P for 2 W'bound aircraft to be presented to S35 at FL360 on parallel headings. B737(B) would be S of the other ac. At the time, neither of the ac were displayed on the S35T or P radar screens. At 1701:35, the S35T instructed B737(A) "*...when you are ready descend Flight Level Three Four Zero*". This is the Standard Agreement Level between S35 and S5. (B737(B) was approximately 155nm away at the time). The S35T could not remember if the S35P had informed him about the 2 W'bound ac at FL360, just before, or after, he had issued the descent clearance. In any case, they were not showing on the radar display and the Paper Flight Strips had not been produced by the ATSA, although they arrived soon after. A handover of the S35T position was carried out and the first transmission by the incoming controller was, at 1705:29, to transfer B737(A), still at FL370, to S5. B737(B) was still outside the displayed range at the time and was 102nm from B737(A). The incoming S35T recollected that, during the handover, he had been advised that B737(A) had been instructed to descend and he believed he had been informed about the 2 W'bound ac but no c/ss had been mentioned.

B737(B) flight established communication with S35, at 1708, i.e. 3min after B737(A) had been transferred to S5, reporting maintaining FL360, heading 280°. The pilot was instructed to continue on the heading. At the time, the subject ac were about 56nm apart, B737(A), with S5, was still maintaining FL370 although it had been given further descent, when ready, to FL320. At 1711:40, realising that B737(B) was further S than normal, the S35T routed it direct to STU. At about this time, he realised the confliction with B737(A), which had still not commenced its descent from FL370 (by now it had been issued with further descent to FL250). He immediately instructed the S5T not to descend B737(A). However, as this was occurring, just before 1711:50, the pilot of B737(A) reported leaving FL370. The S5T transmitted to B737(A) "*roger maintain Flight Level Three Seven Zero acknowledge*". Observing that the ac had commenced descent, he continued "*c/s avoiding action turn left immediately heading north*". The pilot reported climbing again and read back heading N. TI was issued and the pilot reported the other ac in sight. Meanwhile, the S35T had heard his colleague issue the avoiding action turn and, consequently, instructed B737(B) flight to turn L 30° but did not use the term avoiding action. The pilot responded he was in a TCAS descent (1712:07). [STCA activated at 1712:09].

B737(B) was not known to S5, as it would not enter the sector, and was showing on the radar display as a background track. The vertical boundary between the 2 sectors is FL335. Consequently, it was S35's responsibility to ensure separation between the subject ac. In the event, separation was not lost, with both crews reacting to TCAS RAs.

Local investigation revealed that, before the handover of the sector, S35 was not provided with a NUMPO strip for B737(A). This would have been displayed under the BCN designator and would have shown the potential confliction between the subject ac. There would appear to have been some confusion amongst ATSA staff, whether a NUMPO strip should have been provided on this occasion. S35 controllers had previously said that a strip is not required for traffic inbound to the LTMA. However, this only applied to traffic inbound to Heathrow and Gatwick, as these aircraft have to be descended below S35's airspace before BCN. Neither of the 2 S35Ts involved in the incident noticed the omission. Further investigation revealed that it was only the Watch on duty that had not understood the procedure.

[UKAB Note (1): At 1711:56 B737(A) is seen, having just commenced descent through FL368, with B737(B) in its 1 o'clock range 8.2nm at FL360. The next radar sweep 8sec later B737(A) is descending through FL367 700ft above B737(B) at FL360 range 6.3nm. STCA activates 3sec before the next sweep at 1712:12 which shows B737(A) now climbing through FL370 4-6nm NW of B737(B) which is 1200ft below as it has commenced a descent, indicating FL358. Thereafter B737(A) climbs to FL372 as B737(B) also climbs back up to FL360 with the

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CPA occurring at 1712:28 as the subject ac pass starboard to starboard separated by 2.3nm horizontally with vertical separation of 1200ft.]

NATS UNIT MANAGEMENT reports that the misunderstanding amongst the ATSA staff on watch regarding the display of NUMPO fpps was dealt with by the Watch Assistant Supervisor. ATC Ops surveyed other watches and found that the procedure was correctly understood by all therefore no notice was considered necessary.

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 reiterated that the misunderstanding over displaying NUMPO fpps had been resolved on the Watch in question.

From the time that S35P had accepted the 2 W'bound ac at FL360 on parallel tracks (19min before the Airprox), both he and the S35T should have ensured that these ac were taken into account as known traffic even though, at the time, both ac were not displayed on radar nor were their fpps to hand. When the fpps for both W'bound flights became available to the team shortly afterwards and were placed in the strip display, they were the 'aide memoires' to the controllers to reinforce the acs' impending Sector arrival. Owing to their relative positions before entering the Sector, B737(B) was S of the other ac at FL360 which had led to B737(B) flying against the flow of E'bound traffic along UL607/UP2, apparently much further S than the Sector 35 team had expected. These points should have been reinforced to the oncoming controller when the S35T handed-over the Sector.

Discussion then moved on to the use of an unconditional descent clearance by the S35T. One ATCO Member opined that the use of 'descend when ready' is usually employed only when there is no possibility of conflict: this is because the timing of initiation of descent is firmly in the aircrew's hands. In the circumstances pertaining shortly before the subject Airprox, B737's (A) and (B) were potentially in conflict, making it unwise to employ the 'descend when ready' clearance technique without adequate safeguards.

Although the NUMPO fpps for B737(A) was missing, the oncoming S35T could see the E'bound B737(A) on radar at FL370 and was aware of its previously-issued descent clearance as given by the off-going controller when he transferred the flight to S5. B737(B) at FL360 was still not within S35T's displayed range. One ATCO Member opined that immediately prior to this action, the S35T had visibility of both W'bound ac's fpps which could have reminded him of the potential conflict. However, the Airprox occurred about 10mins after the initial descent clearance had been issued by the off-going S35T and 6min after the flight was transferred to S5 when B737(B)'s exact position was unknown. Members agreed that as the S35 team were responsible for separating the subject ac. By allowing B737(A) to 'descend when ready', the ac was placed into conflict with B737(B) and this had caused the Airprox.

The S35T eventually noticed B737(B)'s position and cleared the flight towards STU which drew his attention to the developing situation. He attempted to resolve matters by instructing S5T not to descend B737(A) but this action occurred as the ac commenced its descent. The S5T's instruction to the flight to maintain FL370 went unanswered but the subsequent avoiding action L turn was acknowledged. The S35T, upon hearing his colleague's avoiding action transmission, told B737(B) flight to turn L 30° but the crew reported TCAS RA descent. Both aircrews were aware of the conflict from TCAS TA alerts and had reacted promptly to their complementary RA warnings leading to separation margins not being eroded. These factors allowed the Board to conclude that any risk of collision had been quickly and effectively removed.

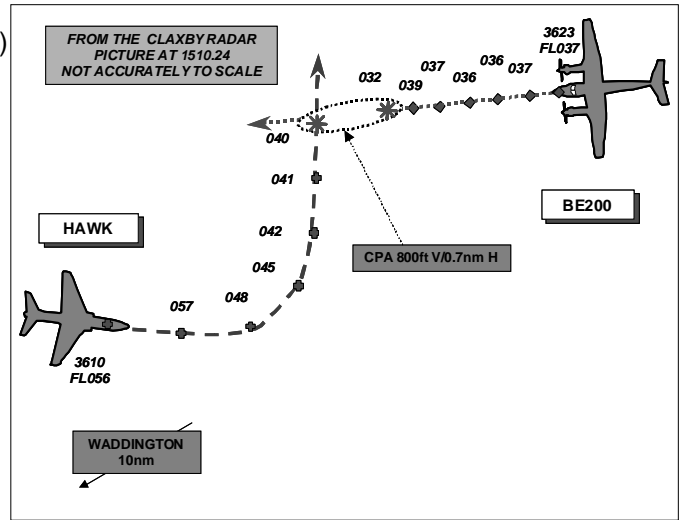
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The S35 team descended B737(A) into conflict with B737(B).

Degree of Risk: C.

AIRPROX REPORT NO 2009-002

Date/Time: 22 January 1510
Position: 5313N 00014W (10nm ENE Waddington)
Airspace: London FIR (Class: G)
Reporting Ac Reported Ac
Type: BE200 Hawk T1A
Operator: HQ Air (Trg) MOD ATEC
Alt/FL: 2500ft NR
 (QFE 973mb) (N/K)
Weather VMC CLAC NR
Visibility: 6km NR
Reported Separation:
 200ft V/500m H Not seen
Recorded Separation:
 800ft V[by interpolation]/0.7nm 1300m)H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BE200 PILOT reports that he was conducting a GH sortie with a student in control in a low workload situation. They were in receipt of a FIS from Waddington APP and squawking 3617 with Mode C and Mode S selected. While they were commencing a visual approach to Waddington they were instructed by APP, who were very busy, to maintain 2500ft QFE to de-conflict with a Sentry ac also on recovery. They then received a TCAS RA commanding a climb; he, the QFI, took control and immediately initiated a climb at 2000fpm as required by the RA. The conflicting ac was seen on the TCAS display climbing from below and at that point a TCAS RA descend instruction was received commanding a 2000fpm descent so he selected 'flight idle' and promptly placed the ac into a rapid descent. A Hawk ac was observed passing through their nose about 200ft above within ½nm laterally on a Northerly heading and they informed Waddington APP of their TCAS descent to 2000ft.

The ac was then recovered to Cranwell at the end of the GH sortie without further incident.

He assessed the risk as being high.

THE HAWK T1A PILOT provided a brief report stating that he was flying an instructional sortie from Warton in a black ac with HISLs selected on. Although in the area and on an IFR practise diversion to Waddington, he did not see the reporting ac.

THE WADDINGTON APP CONTROLLER reports that he was not made aware of this AIRPROX until the following day when he received a telephone call at home from the Supervisor asking for his recollection of the event.

The BE200 pilot free-called APP at approximately 1500 requesting a PD and a visual recovery. He informed the pilot that they should be able to accommodate him in around 15min as the RAFAT were about to taxi at Waddington prior to a display practise in R313. The BE200 pilot elected to maintain a listening watch on APP and the controller agreed that he would contact him when the traffic situation allowed his recovery.

He was monitoring the RAFAT VHF frequency and, as they called ready for departure, he instructed the BE200 pilot to squawk 36?? (he could not recall the exact code); passed the short weather and placed him on a FIS. He thought that at the time the BE200 was about 3nm SE of Wickenby. Shortly afterwards DIR called him for coordination between the BE200 and a Hawk inbound. He confirmed with the BE200 pilot that he was holding not above 2500ft QFE and DIR stated that the Hawk, squawking 3610, would be not below 3000ft QFE until clear.

After the RAFAT were established northbound from the RW20 downwind leg he believed that he passed TI on them to the BE200 pilot and it was about that time that he requested a visual straight-in approach. He thought that he may have then told the pilot to route inbound via the IP. He passed the BE200 pilot's request to Waddington

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GND and he thought that it was acknowledged with a reply of *"one in, E3 rejoining from 2000"*. When the BE200 was about 5nm NE of Waddington, the Supervisor informed him that the straight-in visual approach would interfere with the E3 in the circuit and that he should direct the BE200 to climb to 2500ft for an overhead join. At that point he thought that the Hawk was clear to the NE of the BE200. The BE200 pilot acknowledged the instruction to climb and fly an overhead join and stated that he was visual with the airfield and changing to TWR frequency.

He made no mention at any time of an Airprox, a TCAS alert or any other ac.

MIL ACC reports that a BE200 first made contact with the Waddington APP, requesting a PD for 20min in the visual circuit. APP informed the pilot that the RAFAT were about to depart and they would accept the ac in 10 to 15min. At 1505:44 a Hawk called Waddington DIR having been handed over by LJAO also for a PD. Waddington were colour code Blue with a QFE of 973mbs although this changed to 974mbs during the incident. In addition to the ac directly involved in the incident an E3 was holding in the overhead at 2000ft QFE with Waddington TWR and another E3 was holding 10nm to the E of Waddington at 3000ft QFE. Neither the controllers nor the supervisor involved were aware of the incident until the following day when the BE200 pilot reported an Airprox by telephone.

At 1500:38 APP passed the airfield information to the BE200 pilot as *'RW 20, Blue, QFE 973 mb'* who replied *'20 Blue confirm QFE973 or 983'*, APP reiterated *'QFE 973 at Waddington'* and the pilot acknowledged at 1500:50. APP then completed a handover of another ac, not connected with the incident, to London Military. APP was also monitoring the RAFAT discrete frequency being used by Waddington GND/TWR. APP made several calls to the BE200 pilot confirming the type of recovery and passed TI as *'C/S Red Arrows are just about to depart Waddington inbound to R313'* which the pilot acknowledged. At 1504:45 APP answered a landline call from LJAO NW with a handover of the Hawk and LJAO was instructed to standby for DIR. At 1505:08 the BE200 transmitted *'Err Waddington C/S if your happy we're looking for a straight in approach um.... Self-position visual RWY20'* to which they replied, *'C/S roger keep you advised squawk 3623'* and the pilot acknowledged with a position report, *'3623 and we're err 8 miles East South East of Scampton'*. At 1505:28 APP transmitted, *'C/S err roger Flight Information Service, err just maintain in that area for the time being I've got one E3 holding in the circuit whilst we get these Red Arrows out of the way'* and the pilot acknowledged. APP then transmitted at 1505:43, *'Confirm you've got 2000ft on 973'*, the pilot replied, *'Err 2500ft on 973'*.

A standard handover between LJAO NW and DIR ensued with the Hawk first making contact with DIR at 1505:44 and DIR replied, *'C/S Waddington Director identified FL100 Radar Information, limited traffic information from all around due to poor radar performance'*. APP passed TI to DIR at 1505:55 with a position report on the BE200 but during the conversation the Hawk requested, *'C/S requesting lower altitude'* and DIR instructed the pilot to standby. Having identified the BE200, APP told DIR on landline at 1506:08, *'Err 2500ft Waddington QFE, which is now 974'*. DIR acknowledged, APP informed DIR that the BE200 was now going to be a 'visual joiner'. Seven sec later, APP transmitted to the BE200, *'C/S Waddington QFE now 974'* and the pilot acknowledged the new QFE. APP then made a landline call to TWR passing the BE200 details.

At 1506:24 DIR instructed the Hawk, *'C/S descend report level FL060'*. The pilot acknowledged saying, *'FL err 060 and requesting Radar Advisory C/S'* and DIR then issued a stop of FL080 against unknown manoeuvring traffic at FL050 which the Hawk pilot acknowledged. APP and DIR make several further calls to the BE200 and the Hawk respectively. At 1508:18 DIR transmitted to the Hawk, *'C/S descend report level FL060'*. DIR then called APP on landline, *'Director Request co-ordination'. 'Your traffic squawking C/S (BE200), Bardney East 5 miles'*. APP replied, *'2500ft Waddington QFE 974'* and DIR responded, *'2500ft, roger my traffic not below 3000ft QFE till 3 miles clear'* [there is a 2sec discrepancy between the APP and DIR Tape Transcripts]. At the same time, 1509:04, the Hawk transmitted, *'C/S err level 060 and err Radar Information Service'*. DIR then transmitted at 1509:09, *'C/S roger Radar Information, set Waddington QFE 974 descend report level 3000ft'* which the pilot acknowledged. DIR then responded to the holding E3's enquiry if the 'Reds' have departed. Later at 1509:17 APP transmitted to the BE200, *'C/S traffic West South West 5 miles eastbound co-ordinated not below 3000ft'* and the pilot replied, *'On TCAS looking C/S'*. At 1509:36 DIR instructed the Hawk, *'C/S turn left heading 360'*, the pilot acknowledged and at 1510:57, DIR passed TI on the BE200 as, *'C/S traffic North East 2 miles tracking West working this unit 2500ft Waddington QFE feed you in behind it'* and the Hawk pilot acknowledged saying, *'Err visual C/S'*. APP informed the BE200 that the RAFAT were rolling and then at 1510:17 updated the TI, *'C/S the co-ordinated traffic is left 11 o'clock 1 mile crossing left to right at least 1000ft above'* but the reply from the BE200 pilot was distorted, *'...C/S is .. TCAS descent to 2000ft visual with the Hawk'*. The BE200 repeated his level again at 1510:37, *'Approach did you copy C/S we're now level 2000ft'* and they acknowledged. There are no further

transmissions on the transcripts pertinent to the Airprox. The BE200 was climbed back to 2500ft QFE for an overhead join with further TI being passed and it was transferred to TWR at 1512:25.

Although the BE200 was only receiving a FIS the APP controller passed the pilot accurate lateral TI on the Hawk twice, but may have confused the situation when referring to at least 1000ft vertical separation when only 500ft vertical separation was co-ordinated. The BE200 pilot acknowledged that the Hawk was showing on TCAS after the first TI was called but DIR gave the Hawk a turn towards the BE200 before passing TI, believing that 500ft vertical separation (coordinated) existed between the two ac; this was late and left little time for the Hawk who was receiving a RIS to acquire the BE200 visually.

The radar replay shows the Hawk in a left turn onto 360° still descending through 3700ft QFE some 40sec before the TI was passed to the pilot, who would then have been visual but he would have had very little time to react. The radar replay also shows from Mode C data that the Hawk descended through FL041 (3000ft, 974mb adjusted to SAS 1013mb); the Mode C shows that it descended to FL039, 200ft lower than expected although by then the BE200 was descending, in accordance with the TCAS RA, to 2000ft.

UKAB Note (1): An analysis of the Claxby radar recording show the Hawk tracking E and descending from FL80 while the BE200 is tracking W level at FL037 Mode C, laterally displaced by 3nm to the N. The Hawk continues to descend and when it is at FL48 in the BE200 (still at FL037)'s 1030 position it turns left onto 360 continuing its descent to level at FL40. When the Hawk crosses about 0.7nm ahead of the BE200, the latter can be seen to climb initially by about 200ft before commencing a rapid descent through about 400ft; the ac then diverge.

UKAB Note (2): Since there was some concern regarding the TCAS indications, a full TCAS analysis was requested from and kindly provided by NATS. It should be noted that the TCAS Analysis was **a simulation only** and was based on data from the Claxby and Clee Hill radar heads. The following is a summary of the NATS TCAS analysis.

The analysis showed that both simulations for this encounter indicated the BE200 was issued with an 'upward sense' RA before a downward sense RA as the conflict deteriorated in a very short time (~10 sec). The simulation based on the Claxby single source radar [nearest to the incident position] indicated that the ac began its descent before a downward sense advisory was issued. However, this was in contrast to the Clee Hill simulation which indicated that the descent of the Beech occurred after the 'Descend' RA was issued.

The difference between the simulations is most likely a result of different 100ft increment Mode C interrogations being used in the interpolation process for each radar source.

MOD FTR did not wish to comment

HQ AIR (TRG) comments that the 500ft coordination plan between the King Air and Hawk seemed reasonable but it did not leave much room for error. Consequently, the small altitude difference between the ac and the Hawk's downward flight vector as it turned across the King Air's flight path caused the King Air's TCAS to react.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board was informed that both HQ Air (Ops) and SATCO RAF Cranwell (the BE200 Station) had addressed the issue of the late reporting of incidents which can unnecessarily complicate investigations.

There was discussion among Controller Members and Advisors regarding the use of 500ft vertical separation as applied under military approach procedures whereas an equivalent civilian controller would be required to apply 1000ft. The Board agreed that due to the significant operational differences, 500ft for military units was entirely appropriate.

That being the case, it would be inevitable that in a very few combinations of circumstances, particularly when one or other of the ac had a significant rate of descent/climb towards a cleared altitude (height) and/or there was a

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TCAS crossing scenario, TCAS RAs might occur without any breach of the stipulated 500ft ATC separation minima.

When discussing the cause of this incident, Members were most concerned to ensure that aircrew and controllers should not, consciously or subconsciously, doubt the efficacy of TCAS which, the simulation had shown, had functioned entirely correctly in this incident. Further, again after careful consideration, Members decided not to consider the occasionally-published term 'nuisance warning' as it could be misinterpreted. The Board was unanimous that the controller, the aircrews and TCAS had acted/functioned entirely correctly. Further, the BE200 instructor had reacted appropriately to the TCAS indications resulting in the 500ft separation applied by the Controller being slightly eroded which generated the TCAS demands in this co-ordinated situation.

Several military ac now had either TCAS (1 or 2) fitted and the DARS Advisor notified the Board that, in line with civilian procedures, the units operating these ac had sound operating procedures in their Order Books. It was accepted, however, that military TCAS reporting/investigating procedures for events could be made clearer: HQ Air and DARS agreed to work together towards a solution, probably similar to that used by their civilian counterparts but adapted to recognise the military operating environment.

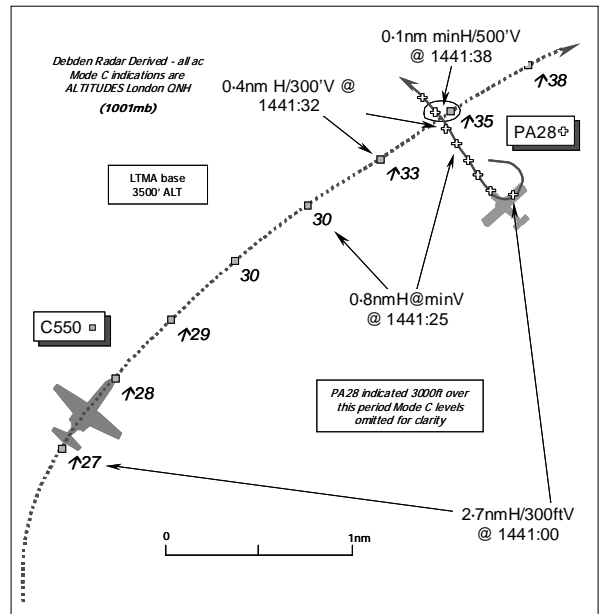
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The TCAS profile flown by the BE200 pilot against the descending Hawk resulted in a loss of stipulated separation.

Degree of Risk: C.

AIRPROX REPORT NO 2009-003

Date/Time: 26 January 1441
Position: 5138N 00031E (7½nm NW of Southend - elev 49ft)
Airspace: London FIR (Class: G)
Reporting Ac Reported Ac
Type: Citation II C550 PA28
Operator: Civ Comm Civ Trg
Alt/FL: 3400ft 3000ft
 QNH (1001mb) QNH (1001mb)
Weather VMC CLAC VMC CLOC
Visibility: 10km+ 20nm+
Reported Separation:
 Nil V/0.1nm H Not seen
Recorded Separation:
 Nil V @ 0.8nm H
 0.1nm Min H @ 500ft V



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE CESSNA CITATION II C550 PILOT reports that he was departing from Southend bound for Hamburg under IFR, in VMC, some 200ft above and 1nm horizontally clear of cloud. A squawk of A0537 was selected with Mode C; both Mode S and TCAS are fitted.

Southend TOWER had issued a departure clearance of “climb altitude 1500ft and radar heading 270°”. Shortly after take-off from RW24, they were transferred from TOWER to Southend APPROACH on 130.775MHz for a RIS. APPROACH instructed them to “climb altitude 3400ft, heading 360°”, followed shortly afterwards by a call to route “direct CLACTON [CLN].” About 1min later, approaching position 245R/CLN/25d whilst heading 065° at 250kt, as they levelled at 3400ft a TCAS TA was enunciated for an ac in their 2 o’clock approximately 2nm distant at a similar altitude. Within seconds he noticed the close proximity of the other ac on the TCAS display and instructed the PF to disconnect the autopilot as they had become visual with the ac, a light single-engine aeroplane – the PA28 - at their level and no more than about 0.2nm away. A second later, the TCAS alert became an RA, demanding a CLIMB at 2000ft/min with which they complied. As the RA occurred APPROACH contacted them on RT to advise of “traffic in your 12 o’clock” whereupon he replied “visual, RA CLIMB.”

They followed the RA CLIMB to 4200ft. Within a few seconds the controller asked them to confirm their altitude and in response he advised that they were “CLEAR OF CONFLICT, level at 4200ft.” APPROACH then instructed them to descend to 4000ft, despite being at 3400ft initially, and handed them across to London CONTROL on 120.175MHz.

As a result of the speed of the hand-off to London CONTROL whilst simultaneously approaching the TMA and needing to obtain their airways joining clearance, he decided not to make an Airprox report on RT at the time. However, as soon as they landed at Hamburg, he completed an ASR/MOR form and forwarded it to his company.

He assessed the minimum horizontal separation as 0.1nm – 200yd – and the Risk as “very high”; both he and his co-pilot were concerned at how close they had come to the light ac. He stressed that if the light ac had not been fitted with a Mode C transponder and squawking, this would probably have resulted in a mid-air collision. His ac is white with gold & blue stripes; HISLS, nav lights and wing recognition lights were all ‘on’.

THE PA28 TUTOR PILOT, a flying instructor, reports that this instructional flight from Stapleford was part of a Flight Instructor’s Course. He was the tutor and pilot-in-command, occupying the LH seat with a trainee instructor in the RH seat and an observer – another trainee instructor - in the rear seat. They were flying in VMC, clear of cloud, with a flat layer of strato cumulus, tops about 1800ft QNH, some 1½nm to the S of their operating area. Operating

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under VFR, he was listening out with Stapleford but not in receipt of any ATS, he thought – [but actually under a FIS from Southend APPROACH]. A squawk of A7000 was selected with Mode C on.

Whilst this visual exercise was being taught they were conducting general handling at about 3000ft QNH, operating at 65-95kt. He and his two other crew members - all experienced pilots - were maintaining a good lookout but no other ac was sighted.

The ac has a white/red colour-scheme and the HISLs and landing lights were on.

THE SOUTHEND APPROACH RADAR CONTROLLER (APR) reports that TOWER had co-ordinated the departure of the C550 from RW24 to depart on a CLN1 SDR, but LTTC had restricted the departure to 'remain outside CAS'. For separation from other IFR traffic training at Southend – not the subject PA28 - he released the C550 climbing to an altitude of 1500ft, heading 270°. The C550 departed at 1437 but TOWER did not immediately transfer the flight to 130.775MHz - when the crew contacted him on the frequency he estimated the ac was 5-6nm W of the Airport. He turned the C550 onto a heading of 360° and climbed it to 3400ft QNH (1001mb). Just before this, LTTC had enquired whether the C550 was imminent and he told them it was just airborne so he requested and received a clearance to 4000ft London QNH.

When the C550 – whose crew had been informed the flight was under a RIS but who had not readback the Radar Service - had the required separation from his other IFR traffic, he told the crew to turn R to CLACTON and climb to 4000ft QNH. There were several unknown contacts in the area, in addition to known traffic. It became apparent that the C550 would pass close to some of these unknown contacts to the NW of Southend Airport so he passed traffic information on the closest at a range of 2nm, which he had seen had been manoeuvring but which appeared virtually stationary at the time. Traffic information was passed again as it was still in confliction - 12 o'clock at ½nm. The C550 pilot responded that he was visual with the unknown ac and also that he had a TCAS RA. Reporting that he had climbed to 4100ft as a result, the C550 pilot advised he was descending back to 3400ft whereupon he instructed the C550 pilot to level at 4000ft. Further traffic information was passed on an unknown ac in the area before the flight was transferred to LTTC on 120.175MHz.

ATSI reports that the Southend 1420 weather was: Surface wind: 100/3kt; Vis: >10km; Cloud: FEW @ 1300ft, SCT @ 1600ft, BKN @ 1800ft; QNH 1001mb. Southend ATC is only equipped with primary ASR.

The PA28 crew contacted Southend APPROACH at 1414 [some 27min before the Airprox occurred]. The pilot reported *"we're a Cherokee and we're on the 0-8-4 out of LAMBOURNE at 13 point 5 steering 1-2-0 at the moment just starting a right turn we'll be operating in this area at various levels and we'd like a Flight Information Service"*. The controller replied *"Understood Flight Information Service Q N H 1-0-0-1 nothing known to affect at this time"*. Apart from traffic information being issued some 4min later, no further communication was made with the flight until approximately 1min after the Airprox had occurred when the pilot reported leaving the frequency.

The APPROACH position was handed over at 1439 [broadly 2min before the Airprox occurred]. The oncoming controller commented that, during the handover, he was informed that the PA28 (fps displayed) was operating in the area of Hanningfield Reservoir – some 9nm NW of Southend Airport - under a FIS. The ac was not identified on radar.

Meanwhile, the C550 departed RW24 on an IFR flight to Hamburg at 1437. The flight was routing on the Standard Departure Route 'CLACTON 1' i.e. to join CAS on track to CLACTON, to cross CLN DME 17 at 4000ft ALT. However, in order to provide separation from IFR traffic overhead SND at 2500ft, its initial clearance, on release by the APR, was heading 270° climbing to 1500ft QNH. The C550 crew established communication with Southend APPROACH at 1439:35, reporting at *".. 1500 foot radar heading 270 degrees"*. The pilot was instructed to *"..turn right heading 3-6-0 and climb altitude 3 thousand 4 hundred"*. He was advised he was being provided with a RIS and would be turned towards CLACTON shortly i.e. when the flight was clear of the IFR traffic at SOUTHEND. The pilot did not read back the radar service, acknowledging the call *"roger"*, although he did later state, in his written report, that he was receiving a RIS. About 30sec later, the C550 was routed to CLACTON and instructed to climb to 4000ft, which the pilot read back at 1440:40.

At 1441:00, traffic information was issued to the C550 *"unknown traffic northeast of you 2 miles manoeuvring level type unknown fairly slow moving"*. [UKAB Note (1): The Debden radar recording shows an aircraft squawking 7000 - the subject PA28 indicating 3000ft London QNH unverified Mode C – 2.7nm NE of the C550 as the latter

is passing 2700ft London QNH.] Shortly afterwards at 1441:30, the traffic information was updated “*very close now 12 o'clock half a mile slightly right to left*”. The pilot responded “*We have..visual and we've got a radar (sic) resolution advisory*”. Once clear of the conflict, the pilot of the C550 reported “*Passing 4 Thousand 1 Hundred now clear of conflict descending back down 3 Thousand 4 Hundred*”, albeit that he had been cleared to, and read back, an altitude of 4000ft.

The radar recording photographs show that when the subject ac were 0.8nm apart, on conflicting tracks, they were indicating the same altitude of 3000ft London QNH (1001mb). Thereafter, the C550 climbed; when horizontal separation had reduced to 0.4nm the twin-jet was 300ft above the PA28 and then some 500ft higher when the range had closed to 0.1nm at 1441:38.

MATS Part 1, Section 1, Chapter 5, which was applicable on the date of the Airprox, defines a RIS as:

“A Radar Information Service (RIS) is an ATS surveillance service in which the controller shall inform the pilot of the bearing, distance and, if known, the level of the conflicting traffic. No avoiding action shall be offered. The pilot is wholly responsible for maintaining separation from other aircraft whether or not the controller has passed traffic information. Under a RIS the following conditions apply: b) 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 complied with the RIS procedures. The controller stated he did not realise that the other ac involved was the subject PA28, although the crew had reported they would be operating in the area where the Airprox occurred. The ac had not been identified and this flight was only being provided with a FIS.

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, together with a report from the air traffic controller involved and the appropriate ATC authority.

The comprehensive ATSI report had revealed that the PA28 pilot was still in communication with SOUTHEND on the APR's frequency when the Airprox occurred. Whereas the PA28 crew had advised the broad area of their intended operation some 27min before the Airprox when they requested a FIS, the flight was not formally identified on the primary radar available to the APR when they were placed under this most basic form of ATS. Thus the controller would not necessarily have been able to recognise the PA28's raw radar contact amongst the myriad of other flights that might have passed by in the intervening period and then pass this on to his colleague who took over just minutes before the Airprox occurred. Thus it was unfortunate that the contact upon which the APR subsequently reported traffic information to the C550 crew had been ultimately shown to be the subject PA28 in communication with SOUTHEND, unbeknown to the controller at the time. The Board recognised, therefore, that the APR would have been unable to proffer any form of warning to the PA28 crew in these circumstances.

It was evident from the flying instructor's frank account that neither he as the tutor in the PA28 nor any of his student instructor colleagues had observed the C550 at all as it closed from their port side and climbed above them. It was plain from the radar recording that the C550 had approached to the left of the PA28 and with the tutor seated on that side a very experienced GA pilot Member wondered if the tutor had been focused on an important teaching point to the 'instructors under training' at the time. For whatever reason, it was clear that the three pilots in the PA28 remained unsighted throughout and this non-sighting by the PA28 crew was, in the Board's view, part of the cause.

Here, from the C550 pilot's succinct account, TCAS had provided an effective warning of the presence of the PA28 - at a range of about 2nm, he had reported. The RT transcript had shown that this was the range reported by the APR within his first transmission of traffic information at 1441:00 which, notwithstanding any errors in the RT recording time base, was possibly a little more than that which the controller estimated at the time - about 2.7nm the Debden Radar recording suggested. Nevertheless, it was clear that the combination of the TCAS TA and the traffic information provided by the APR had enabled the C550 crew to search for the PA28 to starboard and thus with the A/P disengaged they were primed to react quickly when TCAS enunciated the CLIMB RA. The GA pilot Member advised that the visibility from the flight deck of a C550 is relatively good so it was unfortunate that the light ac was subsequently not acquired visually until the PA28 had closed to a range of about 0.2nm, the C550 pilot reports - after the APR had wisely reinforced his earlier report with a further update of traffic information on

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the contact at a range of ½nm. A CAT pilot Member pointed out that they had not achieved their cleared altitude before the TCAS RA demanded they climb further: nevertheless, another pilot Member observed that both pilots would certainly have been fully occupied during this period. Notwithstanding that the C550 crew were operating under IFR, it was plain that whilst transiting Class G airspace, before they entered the known traffic environment of the Class A LTMA, they ultimately had a responsibility under the 'Rules of the Air' to 'give way' to the PA28 closing off their starboard side as they climbed to its altitude in this 'see and avoid' environment. Clearly, they had been assisted in achieving this by the intervention of TCAS, which had proved its worth yet again, coupled with the traffic information from the APR, but Members agreed that late sighting by the C550 crew had also been intrinsic to the Cause of this encounter in Class G airspace.

This Airprox illustrated clearly the difficulties of IFR operations from airports in the 'Open FIR' when only a RIS is provided which requires crews to use visual separation under the doctrine of 'see and avoid' to maintain their own separation against traffic operating entirely legitimately under VFR in Class G airspace. Nevertheless, the C550 crew's appreciation of the situation was sound: the intervention of TCAS and their rapid reaction to it ensured that 500ft of vertical separation existed as the C550 overflew the PA28 leading the Board to conclude, unanimously, that no risk of a collision had existed in the circumstances conscientiously reported here.

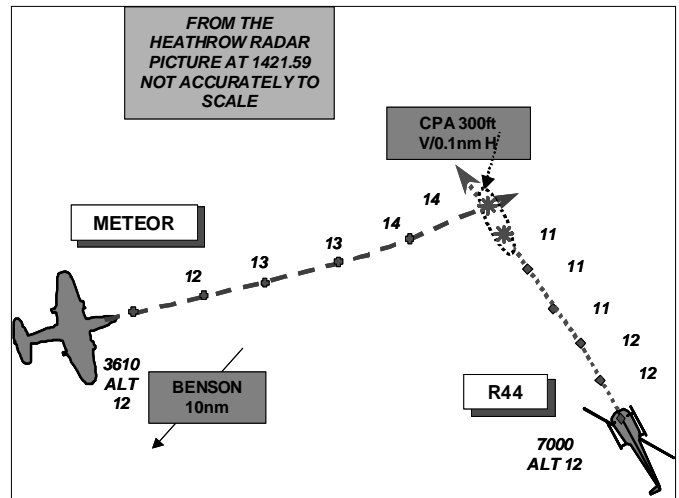
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A non-sighting by the PA28 crew and a late sighting by the C550 crew.

Degree of Risk: C.

AIRPROX REPORT NO 2009-004

Date/Time: 29 January 1422
Position: 5143N 00055W (7nm NW Wycombe Air Park)
Airspace: London FIR (Class: G)
Reporting Ac Reported Ac
Type: Robinson R44 Meteor
Operator: Civ Pte MOD ATEC
Alt/FL: 1100ft 1000ft
 (QNH 1015mb) (Benson QFE 1007 Benson 226ft amsl)
Weather VMC CAVOK VMC CAVOK
Visibility: NR NR
Reported Separation:
 NR NR
Recorded Separation:
 300ft V/0.1nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE R44 HELICOPTER PILOT reports he was flying a private flight from Wycombe Air Park to a private site near Princes Risborough in a green helicopter with strobes and nav lights switched on, squawking 7000 with Mode C and in receipt of a FIS from Wycombe. He had just passed overhead his landing site at 1100ft on his downwind leg and was about to turn onto final when he noticed a Meteor ac to his left about 300m away on what seemed to be a collision course; he immediately slowed his ac and descended in order to avoid the Meteor which continued on its course of straight and level. As he turned onto his final he made his radio call to Wycombe “*letting down at Princes Risborough*” and then told them about a low level military ac. When he landed he checked the identity of the ac and it transpired that there is only one that fits the description and it operates from Chalgrove. He did not assess the risk.

THE METEOR PILOT reports he was flying an ejection seat test flight in a silver ac with no strobes fitted and was operating under a RIS from Benson, squawking as directed with Mode C. Benson called numerous contacts, which were either identified or did not pose a threat, but no mention was made of the helicopter in question and he did not see it.

His company does not NOTAM such flights as they amount to no more in flying terms than local area flying. It involves the ac positioning 5-7nm NE of Chalgrove at similar heights and speeds that would be used if the ac were in a left hand radar pattern to land on RW24 at Chalgrove. The ac lines up on the extended centre line of RW24 at 5nm before making a straight run in whilst descending to 200ft as it approaches the airfield. This activity occurs about 6 times annually and normally consists of one circuit only.

UKAB Note (1): The recording of the Heathrow 23cm radar shows the incident. The Meteor pops up at 1421:39, 7nm NNW of Benson squawking 3601, tracking 080° and indicating an alt of 1200ft climbing very slowly with the R44 in its 1.30 position at a distance of 2nm tracking 340° and also initially indicating 1200ft. Both ac continue towards each other exactly on a line of constant bearing, the R44 descending by 100ft as the Meteor climbs slightly and passes 0.1nm ahead of the helicopter indicating 300ft above it. Without doubting the accuracy of the R44 pilot’s report, the descent and speed reduction he reported is not evident from the radar data.

MIL ACC reports that a Meteor in silver military markings got airborne from Chalgrove at 1416:43 to conduct an ejection seat trial over Chalgrove airfield. The pilot called Benson Zone whilst taxiing on the ground at Chalgrove. Meanwhile a Robinson R44 coloured lime green with strobes and navigation lights on was on a positioning flight from Wycombe Air Park to land at a private site in the vicinity of Princes Risborough.

AIRPROX REPORT No 2009-004

At 1413:03 the Meteor pilot checked in on Zone and, having made two-way contact, the pilot explained the detail of the sortie. 'Roger C/S is a Meteor taxiing for a live firing, running in from the North East at err, 2-5-0 feet and 4-3-0 knots, ready taxi and it will be departing runway 1-3 at Chalgrove' and Zone responded, 'C/S, squawk on departure 3-6-1-0, are you familiar with the NOTAM out reference a funeral at Watlington today'; he was then passed the details which he acknowledged. At 1416:39 the Meteor pilot advised, 'Benson, C/S is lined up 1-3 fully ready'. Zone responded, 'C/S, clear take off at your discretion surface wind at Benson 1-3-0 at 1-0 knots'. The pilot then advised at 1416:47 'C/S I'll be with you on the radio outbound, and when I turn inbound I'll be going to Chalgrove'. At 1419:38 Zone advised the pilot, 'C/S identified what type of service?' The pilot replied, 'Radar Information, C/S' - the Zone controller acknowledged the request, 'C/S Radar Information, limited traffic information from below the, below my radar vector chart, request altitude climbing to London 1-0-1-6'. The Meteor pilot acknowledged at 1419:52, 'Affirmative, climbing to one thousand 1-0-1-6'. Zone then transmitted at 1419:56, 'C/S for your run inbound Benson QFE 1-0-0-7'.

At 1420:05 Zone passed the first TI, 'C/S you will be responsible for terrain clearance at all times, traffic right one o'clock 5 miles reciprocal, indicating 3-0-0 feet above' and the pilot responded, 'C/S looking'; the TI was updated and the pilot became visual at 1421:22. The second contact, believed to be the R44, was called at 1421:30, 'C/S traffic err, South East, 2 miles North West bound, last indicating slightly above'. The Meteor pilot acknowledged and further traffic was then called before the pilot advised Zone at 1421:59, 'C/S and now going back to Chalgrove'.

The Benson Zone Controller correctly identified and limited the service being provided to the Meteor pilot. The radar replay from the London Heathrow radar does capture the Airprox although the timings are difficult to match to the tape transcript due to the Meteor climbing into cover at approximately the time - if not slightly after - the traffic information was passed.

MOD FTR did not wish to comment.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board noted that the Meteor pilot was in receipt of a RIS from Benson to assist him with his responsibility to see and avoid other ac in the Class G airspace in which he was conducting his test flight. The R44 pilot was on a short transit flight from Wycombe, also through Class G airspace, and a LARS would most likely not have been available to him due to his position and altitude. Members also observed that in the circumstances of the incident, under the Rules of the Air (Rule 9 (3)) the Meteor should have given way to the R44. That however is dependent on the Meteor pilot seeing the R44 and in this case, despite accurate TI, he had not: Members therefore discussed possible reasons for this non-sighting. The R44 is a small ac and can therefore be difficult to acquire visually, particularly when - as in this case - it was shown by the radar recording to be on a line of constant bearing with almost no relative motion. Further, the R44 may have been obscured to the Meteor pilot who was preparing his ac for the trial, being about to turn back inbound to Chalgrove for his test run: the R44 may have been below the Meteor's wing or behind the starboard engine nacelle.

Turning to the R44 pilot, a Member opined that he had probably been looking downwards to acquire the landing site visually and thereafter preparing for circuit to the site. Also, the Meteor would have been on a constant bearing, in his 10 o'clock.

Since the Meteor pilot had not seen the R44 and its pilot did not see the Meteor until it was about 300m away, the Board agreed that although the R44 pilot's avoiding action descent had prevented any risk of collision, safety had not been assured.

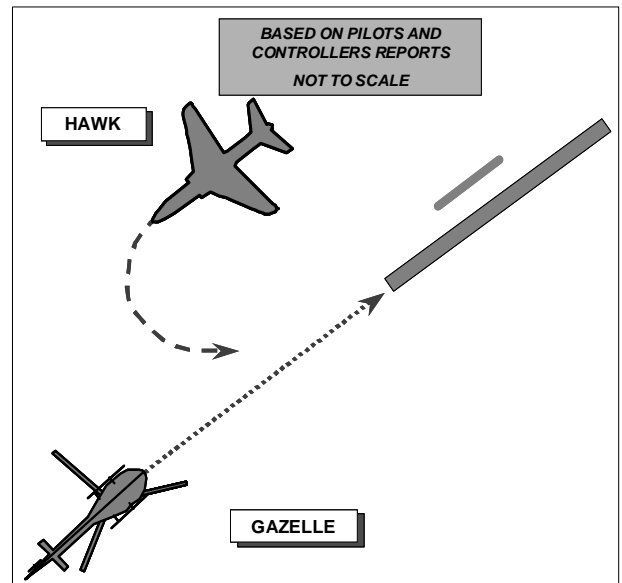
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A non-sighting by the Meteor pilot and a late sighting by the R44 pilot.

Degree of Risk: B.

AIRPROX REPORT NO 2009-005

Date/Time: 13 February 1202
Position: 5108N 00148W (Boscombe Down - elev 407ft)
Airspace: Boscombe MATZ (Class: G)
Reporting Ac Reported Ac
Type: Gazelle Hawk
Operator: ATEC ATEC
Alt/FL: 500ft 300-500ft
(QFE) (QNH)
Weather VMC CLBC VMC NR
Visibility: 10km NR
Reported Separation:
50ft V/50m H NR
Recorded Separation:
NR

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

THE GAZELLE PILOT reports flying a local instrument training flight from Boscombe Down. On recovery while conducting a PAR to RW05 and having broken cloud at 4nm from touchdown, he saw a Hawk ac turning in front of them to land. The safety pilot considered that this could result in the PAR being discontinued and this proved correct as ATC confirmed that they were VMC and then instructed them to “break off approach” and contact Boscombe TWR. After the frequency change the handling pilot in the right seat established comms and the ac commander in the left seat asked if their approach had been broken off for fixed wing visual traffic. At that moment a second Hawk ac was seen close to their left and descending through the level of their ac, turning onto finals for RW05. When first seen, the second Hawk was 50ft above them, descending through their level with slight overtake and 75m ahead. The handling pilot took immediate avoiding action to the right and the ac commander subsequently asked ATC to mark the tape and inform the Supervisor of his intent to file an Airprox report. He assessed the risk as being high.

THE HAWK PILOT reports that he was leading a pair of ac having recovered to Boscombe Down for visual circuits. The pattern was from a normal join. During the downwind leg, TWR cleared a Tutor to leave hi-key, which would cause it to descend through the fast jet pattern. There was also a radio call of a Gazelle at 2 miles “breaking off” their radar approach, which he assumed meant the Gazelle would not be continuing to track down the RW centreline or conflict with a normal finals turn. He was distracted looking for the Tutor as he knew that it could potentially be a conflict when it passed directly through the fast jet pattern into a left low-key position for the Northern RW. Since the ‘breaking off’ call for the Gazelle had been made at 2nm, he assumed that it would not continue to track towards the RW and he did not think that it would be a conflict for a normal finals turn rolling out at about 1nm on the centreline. Once he visually acquired the Tutor and ensured it was not an immediate conflict, he entered the finals turn and made a gear down call. He did not see the Gazelle on extended final, which was as he expected because he understood its pilot had broken off the approach. During their finals turn, TWR queried if he had the helicopter in sight to which he immediately responded negative. Due to that call, he momentarily added power and cut his descent rate but TWR cleared him to continue with his touch and go and did not instruct him either to break off the approach or go around, nor did they state there was a conflict.

At that point, if the Gazelle was continuing inbound on the centreline, it would have been under his nose and therefore not visible from the cockpit. Shortly afterward the Gazelle made a radio transmission to the TWR reporting the Airprox.

After landing his Commanding Officer discussed the traffic pattern with the Tower supervisor. They discussed the conflict on finals and the Tower controller apparently had both ac in sight and felt there was adequate separation so he did not instruct him to go around. He also told the supervisor of their concern regarding Tutors conducting

AIRPROX REPORT No 2009-005

simulated engine failure patterns when the RW05 fast jet pattern is in use since they have to descend through pattern altitude in the vicinity of the fast jet downwind track. The biggest point of confusion that contributed to this Airprox was the terminology of calling helicopter traffic at 2 miles "breaking off" which he assumed meant it would not continue along the centreline to the active RW centreline or be a conflict during his finals turn. In his view the best way to avoid a similar situation in the future would be for TWR to not use this terminology if the ac breaking off an instrument approach is continuing inbound toward the RW in use.

THE SCREEN ADC reports that he was acting as the screen controller and the UT ADC was controlling during a high intensity period with parallel RW operations and radar integration taking place in good VFR conditions. The UT ADC was a 'second tourist' who has previously been endorsed as an ADC at another unit and had some exposure to this kind of intensity of operations.

Prior to the incident the visual circuit consisted of a BAC 1-11; 2 Hawks; a Tutor joining for hi-key at 2500ft QFE and radar traffic, a Gazelle at 7nm on radar to overshoot for the Southside. The U/T ADC correctly passed a broadcast at 7nm stating 'Gazelle to overshoot Southside'. The BAC1-11 turned finals and was given a clearance to land. Hawk 1 elected to go out to initials and this information was immediately passed to Talkdown via the intercom line. Hawk 1 reported initials and the U/T ADC passed clear instructions on the positions of each aircraft in the circuit although he did not pass this information in respect of the radar traffic. That said, he then passed a broadcast stating that the Gazelle was at 4 miles continuing – he believed that this clearance was passed twice as the controller thought his previous transmission had been blocked. The BAC1-11 then landed and was awaiting instructions to vacate the RW. Hawk 2 called finals and after a gear check was instructed to overshoot not below 200ft with one (the BAC1-11) on the RW. Hawk 1 reported downwind and was told 2 ahead (Hawk 2 and the radar traffic, the Gazelle). The BAC1-11 was instructed to vacate next left (the Eastern access) and as it cleared, Hawk 2 - who was short finals - requested to roll. At the same time the 2nm call was requested by Talkdown. The U/T ADC gave Hawk 2 a clearance to roll and on looking out realised that his only option was to break off the radar traffic. The break off was passed with one ahead (Hawk 2) and a broadcast, '*Gazelle 2 miles breaking off was issued.*' Hawk 1 then called finals gear down. He thought that Hawk 1 appeared to be pointing towards the Gazelle and on checking the Hi-Brite he instructed the U/T controller to ask Hawk 1 if he was visual with the radar traffic that had broken off; Hawk 1 replied that he was not and at this point the U/T controller made a quick decision to allow Hawk 1 to make an approach. This decision was based purely on lookout and the fact that the Gazelle had now visibly turned right, away from the approach lane. He considered that had the U/T ADC instructed Hawk 1 to 'go around,' it would have resulted in Hawk 1 going south of the approach lane and into closer proximity with the Gazelle. The decision to instruct Hawk 1 to continue his approach helped to maintain some extra lateral distance between the ac.

The Gazelle pilot asked that the tapes be impounded as he was probably going to file an Airprox. The Supervisor was informed immediately.

UKAB Note (1): The incident took place below the base of recorded radar coverage.

MIL ACC reports at 1157:57 the ADC broadcast on stud 3, '*Gazelle (subject aircraft) 7 miles overshoot south side*'. Seven sec later, Hawk 1 transmitted at 1158.04, '*C/Ss downwind*', the end of the transmission was distorted. The ADC replied, '*C/S surface wind 360/06 say again intentions*': the pilot responded '*C/S will be to roll*' and the ADC acknowledged. Hawk 2 was also on frequency and the ADC transmitted at 1158:18, '*Hawk 2 request intentions*' but the pilot did not respond. At 1158:20 the BAC1-11 pilot transmitted, '*C/S is late downwind to land*' and the ADC responded with only the callsign. At 1158:24 Hawk 1's pilot transmitted, '*C/Sovershoot.....initials*' but the transmission was distorted, ambiguous and quickly followed by the BAC1-11 pilot saying at 1158:50, '*C/S finals gear down*'. The ADC responded at 1158:39, '*C/S clear to land barrier down*'. The ADC then tried to ascertain Hawk 1 pilot's intentions and transmitted, '*C/S er last call was broken say again*'. The pilot responded at 1158:47, '*Proceeding back out to initials*'. The ADC acknowledged this and made an information call to the APP at 1158:53, '*One downwind to initials*'. At 1158:59 the ADC transmitted to a Tutor, '*C/S BAC1-11 finals, Hawk early downwind and Hawk downwind to initials*' which the pilot acknowledged with his callsign. At 1159:10 the second Hawk transmitted, '*C/S downwind flapless...*' but the end of the transmission was distorted and no intentions were passed. The ADC responded at 1159.14, '*Hawk 2 C/S one ahead surface wind 020/10*'. At 1159:46, Hawk 1 pilot reported, '*C/S initial*'. The ADC then passed TI, '*Hawk 1 C/S one er Hawk er mid downwind BAC1-11 on and er Tutor er positioning high key surface wind 360/10*'. The Tutor reported his position at 1200.05 as, '*C/S high key main to land*' but 2 sec later the ADC instructed the Tutor, '*C/S position for the North surface wind 360/10*' and the pilot acknowledged with his callsign. (The North is a parallel strip used only by Boscombe Down-based Tutors).

At 1200:12 the Talkdown Controller used the intercom to inform the ADC of the Gazelle, *'4 miles C/S overshoot south side'* and he responded immediately with a delayed clearance, *'C/S call by two'* and Talkdown acknowledged, *'C/S final clearance delayed continue approach'*. A dual transmission was then made between ADC and Hawk 1, *'Gear down-four miles continuing'*, the ADC then retransmitted, *'Gazelle 4 miles continuing'*. A Hawk C/S also retransmitted his call at 1200:21, although it was again distorted, *'C/S Finalsto roll'*, (the transcript uses the subject Hawk callsign although it is believed that this is actually Hawk 2). At 1200:27 the ADC transmitted, *'Hawk 2 continue'* and the pilot acknowledged. The ADC transmitted at 1200:33, *'Hawk 2 confirm gear down'* and on receipt of the gear check the ADC transmitted, *'Hawk 2 clear overshoot only not below 200ft one on (the BAC1-11)'* and the pilot acknowledged with his callsign. The BAC1-11 was instructed by ADC at 1200.43, *'C?S vacate next left'* and the pilot acknowledged. Four sec later Hawk 1 pilot transmitted, *'C/S downwind to roll'* and the ADC responded with TI, *'C/S er 2 ahead surface wind 360/10'*. This should have included information that one of the two was the radar traffic, the Gazelle, and the other was a similar type on short finals. At this time the Tutor was between high and low key, behind the subject Hawk and was thought by the ADC to be number 4. However, this was not the case as the Tutor should have been considered to be number 1 for the North which is classed as a separate RW and not part of the Main circuit. At 1200:56 another dual transmission was made by the BAC1-11 and Hawk 2, *'C/S vacated to ground... traffic er am I clear to roll'*. This was followed by another 2 simultaneous calls by the Talkdown Controller and the ADC, at 1201:01 *'2 and a quarter miles C/S to overshoot south side'*, and at 1201:02 by ADC, *'Hawk 2 clear to roll'* - the pilot acknowledged. The Tutor transmitted at 1201:05, *'C/S low key'*. The ADC responded to Talkdown at 1201:08, *'Hawk er Gazelle C/S er break off the approach er 1 ahead'* (this was the standard break-off call including reason for the break-off), the Talkdown Controller retransmitted this to the Gazelle 3sec later as, *'Gazelle C/S break off the approach 1 ahead acknowledge'* and a further 2sec later the ADC broadcast, *'Gazelle 2 miles breaking off'*. Another 5sec later at 1201:18 Hawk 1 pilot transmitted, *'Hawk 1 C/S finals gear down roll'*. (At that point as viewed from the VCR, there was no reason to believe that the Hawk had turned finals early and was in conflict with the Gazelle: therefore there was no need for Screen to step in). At 1201:23 (it took Talkdown 12sec to send Gazelle to the TWR frequency; Talkdown using the intercom informed the ADC, *'Gazelle C/S continue with Tower stud 3'*. One second later at 1201:24 the ADC transmitted to the Hawk, *'C/S er roger Gazelle 2 miles breaking off are you visual'* and the Hawk pilot responded, *'Ah negative for C/S'*. The ADC replied, *'C/S er roger er confirm gear was down'* and the pilot said *'C/S gear is down'*. The ADC issued the clearance at 1201.35, *'C/S clear to roll barrier up'* which the Hawk pilot acknowledged. The Tutor reported at 1201:40, *'C/S finals North'*, the ADC responded *'Tutor C/S Hawk final for the main clear land North'* and the pilot acknowledged. At 1201.52 the Gazelle pilot made first contact with the ADC on Stud 3, *'Tower C/S is turning south side'*, the ADC responded, *'C/S join south side RW 05 QFE 1008 2 in 1 north side'* and the pilot acknowledged *'2 in roger C/S'*. At 1202:13 the Gazelle transmitted, *'...see the Hawk on finals coming down on top of us ah we'll give you a call on land line'*. The beginning of the transmission was distorted but the ADC acknowledged.

In the ADC Screen controller's report he acknowledged that performance may have been degraded due to excessive workload. The report also acknowledges the student's decision to break off the Gazelle at 2nm but makes no mention of the lack of information that would have been expected in that break-off transmission. At 1201:08 the ADC told Talkdown to "break off the approach **one ahead**"; this is standard phraseology. However, a positive joining instruction to the Gazelle to join south side one ahead turning finals would have been more appropriate (the one ahead at this stage was Hawk 2 and not Hawk 1 which was involved in the incident). The Screen then had to prompt the student to confirm that the Hawk pilot was visual with the Gazelle.

It is a fine balance on when to take control from a student; the Screen elected to allow the student to continue and had observed the Gazelle making a turn to the right positioning for the south side. At that point the Screen considered that it was safer to allow the Hawk to continue its approach as he believed that it would afford more lateral separation. Military aerodrome control differs greatly from civil operations; the military controller is expected to sequence the mixed arrival of IFR and VFR traffic in the visual circuit. It is imperative that the pilot maintains good situational awareness at all times and uses the information passed by the ADC to ensure he sequences himself safely. Tower controllers are not responsible for positively controlling ac in the visual circuit; only for providing good situational awareness. Pilots are expected to remain in visual contact with traffic and take their own visual separation. Despite being told of the position of other ac in the visual circuit and given broadcasts at 7, 4 and 2 miles the Hawk 1 pilot did not appear to be fully aware of the position of other ac. That said, the Hawk pilot was passed TI when he was downwind but he should have been told that one of those ahead was radar traffic at 3 miles.

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Having discussed this at length with SATCO Boscombe Down there was no reason for the Hawk pilot to think that the Tutor was one of the ac ahead – the Tutor pilot reported High Key and was instructed to position for the North so that it would not interfere with the circuit for the main RW. The Tutor pilot was given the position of all the ac in the visual circuit when he joined for his PFL. Therefore, it was the Tutor's pilot's responsibility to ensure that he was visual with all circuit traffic prior to leaving high key and there was no need for the Hawk pilot to be visual with the Tutor. In addition, SATCO highlighted that the lookout from the Tower for RW05 is poor and it is impossible to make a clear judgement call as to which ac on finals will conflict with radar traffic. Therefore, when the Hawk 1 pilot reported finals the ac appeared to be behind the radar traffic and was therefore asked if he was visual with the radar traffic at 2 miles. Throughout this busy and complicated 5min 16sec period the Supervisor was in the radar room assisting what was also a very busy ops room. The ADC had to repeat messages as well as request pilots to confirm their intentions as they did not follow standard procedure and pass details at the appropriate point in the circuit. Moreover, some R/T was poor with many distorted transmissions and aircraft/controllers stepping on each other's transmissions – this could have led to the Hawk 1 pilot missing some important calls which increased the ADC's workload considerably.

As a result of this incident SATCO has in conjunction with the aircrew STANEVAL initiated a review of the instrument and visual joining procedures.

MOD FTR 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, reports from the air traffic controllers involved and reports from the appropriate ATC authorities.

The Board noted that this had been a difficult incident to analyse accurately, in part because of the very busy and mixed nature of operations at Boscombe Down which necessitate some uncommon procedures. Members also noted that there is no deadside at Boscombe Down due to helicopter operations on the S side of the airfield which precludes normal break-off procedures from instrument approaches. (Such procedures normally require pilots (when visual with the airfield) to move their ac off the approach path to the dead-side, facilitating separation from and therefore continued use of the visual circuit). Some Members expressed surprise that locally published procedures did make provision for this eventuality.

Members noted that the airfield was very busy at the time of the Airprox, there being a very complex combination of large, small, slow and fast ac operating there, one of which was undertaking a PFL exercise. One pilot Member opined that during such circumstances it would have been wise not to permit simulated emergency procedures as these can add to the complexity of the traffic situation and increase controller workload.

There was discussion among both pilot and controller Members regarding the precise meaning of the term 'break off the approach'. The majority view was that this meant that there was a responsibility on the pilot of the 'breaking off' ac, having established that he was now operating under VFR, either to visually acquire all other circuit traffic and integrate into the visual circuit or to avoid it and declare his intentions if he does not wish to join. There is also an onus on the ADC to pass information regarding all other traffic and to clearly establish the intentions of the pilot breaking off the approach. Since Boscombe Down does not have a deadside, it is imperative that pilots in the circuit are visual with and deconflict from all traffic (including instrument traffic if notified of such). If visual contact and a good mental air picture cannot be established then pilots should consider 'going around' before any potential conflict takes place. Notwithstanding this however, the visual circuit is a VFR environment and all pilots have an obligation to see and integrate with other traffic. Members considered that the Hawk pilot should have been aware of the Gazelle from the TI passed to him and, if not sure of its precise position or its pilot's intentions, should have taken positive action to locate and avoid it if, as it was, potentially in conflict. This, Members agreed, had been the prime cause of the incident.

As with many incidents however, Members observed there were several other factors which when combined either contributed to or did not prevent the conflict. When the Gazelle pilot was instructed to 'break-off' by the Talkdown Controller at 2nm, he continued for 12sec before establishing comms with TWR; this had reduced the time available for the (very busy) TWR Controller to pass joining/deconfliction instructions. Secondly, the No2 Hawk (ahead of the leader) had flown a flapless approach necessitating a slightly extended finals position. Pilot Members thought that this may have forced the Hawk leader also to adopt a bigger circuit.

While acknowledging that he was very busy and the incoming RT was sometimes poor, Controller Members considered that the TWR Controller/Screen had also played a part in that he/they did not anticipate the confliction earlier and take timely and positive action to prevent it, possibly by breaking off the Gazelle earlier at 4nm or instructing the subject Hawk to go around from downwind at circuit height. Members/Advisors had observed on several recent incidents involving trainee controllers under supervision that sometimes there had been a reluctance of supervisors/instructors to assume control when the situation degenerated and conflictions had then ensued. While not familiar with the precise circumstances of this incident, an experienced Controller Member reminded the Board that best practice is to step in in good time and thus prevent such occurrences.

When assessing the risk, Members noted that the Hawk pilot had not seen the Gazelle throughout the evolution; however the Gazelle pilot(s) had seen the Hawk but only as it passed 50ft directly above them. The right turn made by the Gazelle pilot had only been to increase the separation after the CPA. Accepting that the Hawk was above the Gazelle and that the TWR controller visibly noted that there was some separation, Members agreed that there had been no actual risk of collision; however they also agreed unanimously that the normal safety margins for the visual circuit had been significantly eroded.

The Board noted that Boscombe Down are reviewing their joining procedures and endorsed this review. After some discussion and with the assurance that break-off procedures will be part of the review, it was felt that the Boscombe Down action obviated the need for any Safety Recommendation. The Board asked that the Director be informed of the progress and outcome of this review: HQ Air Command undertook to ensure that such reports were furnished to the Airprox Board.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: In a busy and complex traffic situation, the Hawk pilot turned into conflict with the Gazelle which he did not see.

Degree of Risk: B.

AIRPROX REPORT No 2009-006

AIRPROX REPORT NO 2009-006

Date/Time: 13 Feb 1445

Position: 5143N 00217W (O/H Nympsfield
- elev 700ft)

Airspace: LFIR (Class: G)

Reporting Ac Reported Ac

Type: Grob G103 Glider PA28

Operator: Civ Club Civ Club

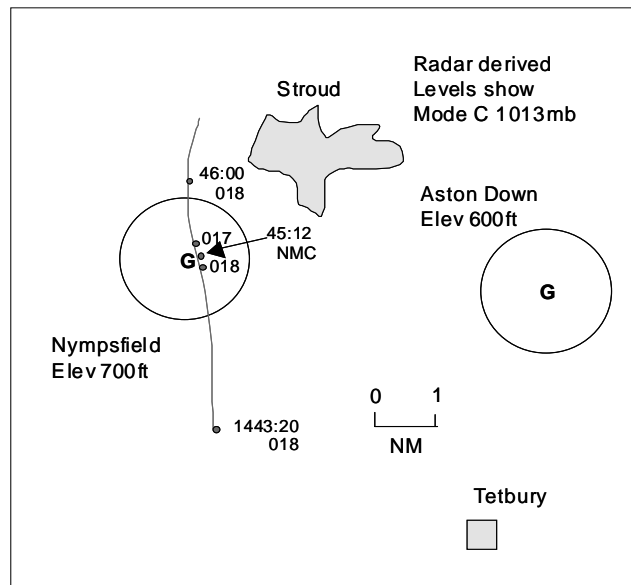
Alt/FL: 1300ft↑ 2000ft
(QFE) (RPS)

Weather VMC CLBC VMC CLNC

Visibility: 40nm 30km

Reported Separation:
Nil V/500ft H Not seen

Recorded Separation:
NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE GROB G103 GLIDER PILOT reports flying a routine training flight with a student from Nympsfield and listening out on Glider Common frequency 129.975MHz. The visibility was 40nm below cloud in VMC and the ac was coloured white with no lighting or transponder fitted. The intention was to fly a standard winch launch to 1400ft QFE after which the student would complete some training exercises before rejoining for a LH cct to land. At about 800ft on the launch heading 075° whilst climbing rapidly (2600fpm) a white coloured light ac, possibly a PA28 type, coloured white/blue came into view in their 1 o'clock high, some 500ft above their glider, crossing from R to L seemingly travelling towards the winch. Light ac frequently fly O/H the airfield but normally it is, by good fortune, rare to see one at the same time as a launch. They continued with the launch and monitored the situation before aborting at 1300ft QFE by which time the PA28 was some 500ft horizontally away slightly L of the ac's nose at the same level.

THE PA28 PILOT reports being unaware of being involved in an Airprox until being contacted by RAC after tracing action but provided details of his solo flight from Bournemouth to Wolverhampton/Halfpenny Green. The visibility was 30km in VMC with no cloud and the ac was coloured white/blue. Initially routing to Warminster at 2000ft and 100kt he was talking to Boscombe Down before changing to Lyneham on the next sector via Trowbridge, W of Chippenham, transiting at 1500ft QFE. He then climbed back to 2000ft RPS (up 100ft) passing W of Hullavington to Tetbury then between Nympsfield and Aston Down, he thought, towards Stroud and then on towards Gloucester. On the leg past Nympsfield he was squawking 7000 with Mode C and believed he was establishing contact with Gloucestershire on 128.55MHz to request a FIS. No other traffic was seen on this leg. Looking down it would have been difficult to see other traffic owing to the patchwork of snow-covered fields covering much of the area. In fact it had crossed his mind that there may be no gliders flying owing to the fields being covered in snow.

UKAB Note (1): The UK AIP promulgates Nympsfield as a Glider Launch Site centred on 514251N 0021701W where aerotow launches take place and winch launches may be encountered up to 3000ft agl during daylight hours; site elevation 700ft amsl.

UKAB Note (2): Met Office archive data produced the Cotswold RPS 1400-1500Z as 1021mb and a Nympsfield QNH was calculated as 1024mb.

UKAB Note (3): The Cleve Hill radar recording does not capture the Airprox as the Grob glider is not seen at all. At 1443:20 a 7000 squawk is seen 2.9nm SSE of Nympsfield, believed to be the subject PA28, tracking 350° level at FL018 (2040ft RPS 1021mb or 2130ft QNH 1024mb). A steady track is maintained, the PA28 passing almost directly O/H Nympsfield 2min later at 1445:20 showing NMC. The radar sweep 8sec before shows the PA28 indicating FL018 (2130ft QNH 1024mb) and 8sec after FL017 (2030ft QNH 1024mb). The Grob pilot reported

aborting his winch launch at 1300ft QFE (2000ft QNH) as the PA28 passed 500ft ahead. Shortly after this at 1446:00 the PA28 is seen to have commenced a slow R turn 1.25nm N of Nympsfield level at FL018 (2130ft QNH) eventually steadying on a track of 010° to the W of Stroud towards Gloucester.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Although the PA28 pilot had intended to fly between the 2 glider sites at Aston Down and Nympsfield, the radar recording shows the ac's track passing O/H Nympsfield which was active and this had caused the Airprox. The PA28's Mode C indicated the ac was flying at about 2000-2100ft amsl (1300-1400ft agl), well below the promulgated winch cable release height (maximum 3700ft amsl or 3000ft agl), a situation which exposes any transiting ac to two risks: from a rapidly climbing glider, whose pilot has a poor field of view during launch, and from the launch cable. Fortunately, as he was climbing through 800ft agl, the Grob glider pilot saw the approaching PA28 in his 1 o'clock high and monitored its flight path as it crossed from R to L ahead. He aborted the launch at 1300ft agl with the PA28 about 500ft ahead at the same level. Although this encounter had had the potential for being a serious incident, as the glider went unseen to the PA28 pilot, the timely acquisition of the PA28 by the Grob pilot was enough to persuade the Board that any risk of collision had been quickly and effectively removed.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The PA28 pilot flew overhead a notified and active glider site below the promulgated winch cable release height and into conflict with the Grob glider which he did not see.

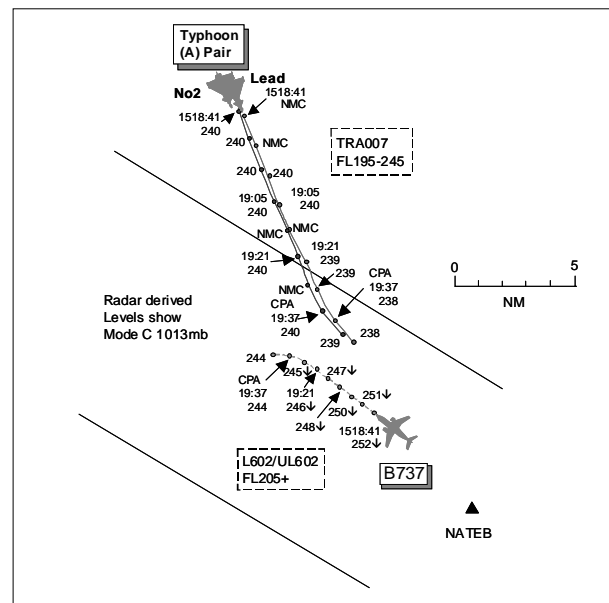
Degree of Risk: C.

AIRPROX REPORT No 2009-007

AIRPROX REPORT NO 2009-007

Date/Time: 11 Feb 1519
Position: 5510N 00154W (10nm NW Newcastle)
Airspace: UL602/TRA007 (Class: C)
Reporting Ac Reported Ac
Type: B737-800 Typhoon x 2
Operator: CAT HQ Air (Ops)
Alt/FL: ↓FL210 FL240

Weather VMC CLBL VMC CLNC
Visibility: Unltd 50km
Reported Separation:
NR V/2nm H 700ft V/4.4nm H
Recorded Separation:
400ft V/2.3nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE B737 PILOT reports inbound to Edinburgh IFR at 425kt and in receipt of a RCS from Scottish on 124.5MHz squawking with Modes C and S. Near to NATEB [Newcastle] during an intermediate level-off at FL210, he thought, [actually descending through FL250], ATC told them "...avoiding action L heading 210°". They followed the instruction and during the turn they received a TCAS TA aural warning. The conflict was resolved almost immediately and they were turned back onto their original course. Although they were flying between layers no visual contact was ever made on the other ac which passed, as seen on TCAS, about 2nm away at a similar level. He did not assess the risk.

THE TYPHOON FORMATION LEAD PILOT reports flying a local training sortie in OTA E from Coningsby, squawking with Mode C and in receipt of a RCS from an AWACS ac. On completion of the sortie, the Lead pilot requested and initiated a climb to FL360 on radar heading 160° at 450kt. ATC [AWACS Fighter Controller] instructed him to level at FL240 and once level the Lead had a radar contact on a 'stranger' at range 13nm which was called at 164°/10nm tracking NW at FL250. By 7nm Lead was visual with an ac, R 1 o'clock slightly high passing down the RHS. ATC then directed Lead to turn L heading 100° which he queried with 'say again'. The direction was repeated with an emphasis of 'radar control' and the turn was initiated. ATC asked for his passing heading, which was 110° at the time, followed by an instruction to expedite onto 020°. The other ac, a B737, was seen to pass 700ft vertically and 4.5nm horizontally clear with a low risk of collision.

THE SCACC TAY PLANNER+TACTICAL reports working as an OJTI when the trainee and he observed 2 unknown contacts heading towards airway L602 indicating FL238 and FL240 squawking 4600 and 4700 respectively. The B737 flight was issued with avoiding action in an attempt to maintain separation against the unknown ac. The B737 crew did not react to the instruction so it was issued again and the unknown ac then penetrated CAS and standard separation against the B737 was lost. The B737 crew reported not visually acquiring the unknown ac at any time.

THE AWACS FIGHTER CONTROLLER reports acting as a screen controller to a trainee working 4 Typhoons conducting 2v2 within OTA E from SFC to FL330 under FIS/RIS and RCS. Upon completion of the sortie, the Typhoons requested 2 individual recoveries at FL360 back to Coningsby. To the S and SE of Newcastle were 2 ac at FL330 and FL280. He told the trainee to place an initial restriction of FL240 on both pairs of Typhoons to allow the traffic to continue heading N which would allow the Typhoons to flow SE then climb when traffic was no longer a factor. The traffic at FL330, the subject B737, was seen in a slow descent so maintaining the Typhoons at FL240 would still have allowed the controller to call the traffic even if it still continued its descent below FL245. The leading pair of Typhoons, not the subject ac, were given a heading to route to the E of Newcastle. The subject

pair of Typhoons, which were climbing through FL115, were seen initially on a heading that would have taken them to the E of L602 O/H Newcastle. Whilst discussing with the trainee the need to place a height restriction on the Typhoons and the need to delay the handover to London Mil owing to the dividing line of responsibility between Scottish and London Mil at 55N, the subject Typhoons were seen on a heading that was taking them into L602. The conflicting B737 was descending and had taken a turn to the NW on L602 so he told the trainee to take control of the subject Typhoons. A call was made for them to turn L in an attempt to remain clear of L602; neither a RCS nor avoiding action was given. During this period he was continually trying to get the trainee to take positive control of his ac but, upon reflection, he should have taken control of the frequency earlier in order to maintain separation minima.

THE AWACS FIGHTER ALLOCATOR reports that at 1450 he took over the position and was seated in position 16. Four Typhoons were on frequency under the control of FC, a student controller supervised by an experienced screen instructor, seated in position 11 and out of his immediate line of sight. Although the FC had been at the console from 1305, he had not had any ac on frequency until the Typhoons had checked in at 1440. During the Typhoon's recovery he advised the FC of some de-confliction against traffic for the lead pair. He could hear on the intercom that the instructor was guiding the student on this issue and the lead pair passed the traffic with sufficient height and lateral separation. At the same time he noted that the trail pair, the subject Typhoons, were approaching CAS in confliction with traffic. He directed the FC on intercom to give avoiding action and he could hear the instructor telling the student to turn his ac. A normal turn was given by the student and he observed the subject Typhoons enter L602 and break minimum separation on the GAT ac, also seeing this traffic turn away and descend.

THE AWACS UNIT SAFETY MANAGEMENT OFFICER reports that at the time the Typhoon (B) formation entered CAS the pair of ac were 93nm from the AWACS. E3D separation standards state beyond 80nm from the AWACS 10nm separation needed to be applied against traffic and 5nm separation when less than 80nm distant.

ATSI reports that the incident took place 10nm NW of NATEB in Class C CAS of Airway L602, which in this position extends from FL205 to FL245. The conditions for flight within Class C airspace are published in the UK AIP Page ENR 1-4-4 and include the requirement to obtain an ATC clearance before entry.

At 1515:30, the B737 flight made its first call to the ScACC TAY sector, reporting descending to FL260 to be level abeam NATEB and on a radar heading of 325°. The TAY SC instructed the flight to continue on the heading and descend to FL220. The flight was en-route to Edinburgh from Poznan, IFR, and being provided with a RCS by a trainee TAY SC, accompanied by a Mentor; the traffic level was described as light.

The radar heading was required to position the ac on the N side of Airway L602 against traffic to the S. By 1517:34, the B737 had passed NATEB and 30sec later was issued a minor heading change onto 320°. The Unit report states that both controllers had been aware of the concentration of military activity to the N of L602. Their attention was then drawn to a pair of ac in close formation, tracking SSE towards the N boundary of the airway. Both were squawking AWACS-allocated codes with Mode C. The formation's track had been consistent and at 3.2nm from the boundary showed no sign of turning away. The B737, meanwhile was tracking a little over 3nm inside the boundary and within the MATS Part 1 guidelines, which at Section 1, Chapter 5, Page 13 state *"Although aircraft operating in controlled airspace are deemed to be separated from unknown aircraft flying in adjoining uncontrolled airspace, radar controllers should aim to keep the aircraft under their control at least two miles within the boundary."* It was now 1519:10 and the SC decided to take action, transmitting *"(B737's c/s) avoiding action turn left heading two one zero degrees unknown military traffic in your one o'clock range three mi-miles Flight Level two four zero"*. The response was *"Sorry say again (B737's c/s)"* and the SC repeated the avoiding action instruction, which was read back correctly. The SC then updated the TI *"It's unknown mil-military traffic er it's just entered the airway er in your two o'clock range two miles"*, the pilot replied with only c/s and *"looking"*.

The radar recording shows that when the first avoiding action turn was issued the B737 is passing FL248 Mode C, with the military formation in its 0130 position at 7.4nm. The lead ac is at FL240 and the No2 is at FL239 Mode C. By the time the instruction is issued a second time, the range between the B737 and the lead aircraft is 4.5nm. CPA occurs at 1519:37, when the B737 is just starting the L turn at FL244 Mode C and the formation's No2 is passing abeam at 2.3nm and FL240 Mode C. By this time the formation had penetrated the Airway by approximately 1nm.

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Twenty seconds later at 1520, the controller transmitted “(B737 c/s) now clear of traffic turn right again heading three two five degrees”. The SC then asked the pilot if at any point he was visual with the traffic: the response was “Er negative had him TCAS”. The pilot made no further reference to TCAS and a short while later was transferred to the next sector without further incident. The military formation, meanwhile, was established in a L turn passing E, eventually exiting the airway some 8nm SE of where it had entered.

The action to be taken by controllers when they observe unknown ac, which they consider to be in unsafe proximity to traffic under their control in Class A, C and D Airspace, appears in MATS Part 1, Section 1, Chapter 5, Page 15, Paragraph 15.2 (table) and 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 passed.” In addition Paragraph 15.3 states “When avoiding action is issued to an aircraft under a Radar Control Service, controllers must seek to achieve the required minima and pilots must comply with the instructions given. In these circumstances, pilots must comply with avoiding action even if they report visual with the other aircraft.” The required minimum was 5nm or 5000ft on Mode C responses. On this occasion the TAY SC was prompt to recognise the potential threat that the military formation represented and took prompt defensive action. Attempting to achieve a minimum of 5000ft vertical separation was not a practical option in the limited time available, hence an avoiding action turn was issued to the B737. Unfortunately, the SC had to repeat the instruction before a response was received from the pilot which delayed the turn for a few seconds. In the end, 5nm separation was not achieved until after the B737 had passed abeam the formation. Nevertheless the SC’s action was effective in reducing the risk exposure to the B737.

MIL ACC reports that the Typhoons were under the control of a student fighter controller (FC) on board an RAF E3D. The Typhoons were recovering to RAF Coningsby having been operating in OTA E. The screen controller was also an experienced fighter controller (FC Sup). An extremely busy and complex environment, fighter controlling from an E3D is recognised as one of the Royal Air Force’s most challenging tasks. On frequency at the time of the incident were 2 pairs of Typhoons, A and B flights.

From 1515:07 a series of RT exchanges took place lasting 1min between the first pair of Typhoons (A flight) and the FC, establishing the formation’s requirements to return to Coningsby climbing to FL360. TI was passed on traffic crossing 12nm ahead on a NW’y track, (A) Lead reported radar contact and stopped climb at FL150. Shortly after this the formation was cleared to climb to 24000ft. (A) Lead requested the FC to say again and this was repeated with TI being added on the subject B737 which was crossing their track descending through FL300. (A) Lead acknowledged the transmission and read back the climb clearance.

At 1516:06 the subject Typhoon formation (B flight) Lead transmitted ‘FC, (Typhoon (B) c/s) flight climbing to flight level 7-0, requesting 3-6-0, radar control, RTB Coningsby’. FC then broadcast “Typhoon (A and B) flight, local altimeter setting’s now 1-0-1-3” which was acknowledged by the Lead (A) pilot and then the Typhoon (B) Lead. At 1516:48 Typhoon (B) Lead carried out a radio check with FC and at 1516:54 FC responded ‘Go ahead’. Typhoon (B) Lead responded ‘(Clipped)...c/s climbing to flight level 1-1-5 this time requesting 3-6-0’ which the FC acknowledged with ‘Copied’. The FC then transmitted ‘(Typhoon (B) c/s) you’re clear to climb to flight level 2-4-0’. Typhoon (B) Lead responded at 1517:10 ‘Climbing to 2-4-0, (Typhoon (B) c/s) flight’. Typhoon (A) Lead then reported ‘(Typhoon (A) c/s) level flight level 2-4-0...(indistinguishable)’. At 1518:04 FC transmitted ‘(Typhoon (B) c/s), stranger ‘BRAA’ 1-4-0, 12...track west, indicating flight level 1-5-0’ which was acknowledged. At 1518:40 Typhoon (B) Lead reported ‘(Typhoon (B) c/s) flight level flight level 2-4-0’ which was acknowledged by FC at 1518:43. At 1519:03 FC transmitted ‘(Typhoon (B) c/s) stranger ‘BRAA’ 1-6-4, 10, track northwest, indicating flight level 2-5-0’; this was the subject B737. Typhoon (B) Lead responded ‘(Typhoon (B) c/s) visual with that traffic’ which FC acknowledged and then transmitted ‘(Typhoon (B) c/s) come right 1-0...er left 1-0-0’. Typhoon (B) Lead replied ‘Apologies, say again ((B) c/s). FC responded at 1519:27 ‘((B) c/s) radar control, come left 1-0-0’. At 1519:31 Typhoon (B) Lead transmitted ‘Radar control, left 1-0-0, (B), visual that previous traffic’.

At 1519:41 FC Sup transmitted ‘Call your heading passing’ to which Typhoon (B) Lead responded ‘Passing flight...correction...heading 1-1-0’. FC then transmitted ‘(Typhoon (B) c/s)...’ followed by a pause and then ‘Expedite heading 0-6-0’, Typhoon (B) Lead replying ‘Expediting 0-6-0, (B) c/s’. At 1520:13 Typhoon (B) Lead reported ‘Steady 0-6-0, c/s. Ten seconds later at 1520:58 FC transmitted ‘(Typhoon (B) c/s), climb, turn right heading 1-7-0’. Typhoon (B) Lead responded ‘Right 1-7-0, requesting height to climb to’. FC replied ‘When steady heading 1-7-0, climb 3-6-0’ to which Typhoon (B) Lead responded ‘1-7-0, when steady, 3-6-0, for (B) flight’.

Immediately after this FC cleared Typhoon (A) flight to FL360, the Lead pilot replied asking for FL300 which was approved. When Typhoon (A) Lead reported level at FL300 and requested a R turn of 20° the FC Sup transmitted '*Typhoon c/s, FC, standby this, handing over to London, wait one*' which was acknowledged at 1522:29 '2-1'. Further administration calls are made between FC and the entire Typhoon c/ss before the handover to London Mil is completed at 1527:41.

In the FC screen's report he acknowledged that he was aware of the CAS to the S and the civil traffic: he tried to get the student to take positive control of the Typhoons. The screen acknowledged that he had to prompt the student to place an initial level restriction on the Typhoons and subsequently turn the ac; by not taking direct control vital seconds were lost. The student, who was under training review, later stated that he knew he needed to perform well to stay in post and thought this added to the pressure. Typhoon (B) Lead pilot reported visual with the traffic, the B737, when it was called which is an acceptable response in Class G. In Class A or C airspace however, being visual with an ac is not sufficient to maintain prescribed separation. By not passing timely avoiding action the FC allowed his ac to erode separation with CAT.

HQ AIR (OPS) comments that the Typhoon leader asked for a RCS and a climb to F360. This appeared, initially to be ignored by the FC and only on the subsequent call was the Typhoon flight cleared to F240. However, clearance into CAS or any type of service was never passed by the FCs. The Typhoon Flt Leader could reasonably have assumed that he was cleared into CAS as he had been cleared to F240. When traffic was passed to him he, reasonably, informed the AWACS that he was 'visual'. Only in a subsequent transmission was the Leader told that he was under a RCS but was never given any avoiding action.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The ASACS Advisor informed Members that owing to the configuration within the E3D, the FA at position 16 would have had his back to the FC (Sup) and FC at position 11. The FC occupied the seat immediately in front of the console whilst the FC (Sup) monitored by standing behind. Liaison between FC (Sup) and FC does have its problems when using communications nets and frequencies - owing to sharing them with other mission crew - and isolation from the communications panel when using a discrete dial function. Normal practice is to talk off headset.

The Typhoon (B) Lead was ultimately responsible for remaining outside CAS. Military ATCO Members opined that as part of SOPs during this routine operational sortie, when Typhoon (B) Lead commenced climb and requested FL360, a RCS and a routeing direct to Coningsby and was cleared to FL240, that exchange with the FC had implied that the Formation Leader's requested direct route was accepted. At the time, the ac were within the Class C airspace of TRA007 so FL240 was acceptable, the formation only having to remain outside CAS and therefore clear of the airway and the B737 inside it. However, the Typhoon's track was towards L602 and a military pilot Member opined that the formation Lead should have confirmed that the flight was cleared through the airway. Most probably the pilot would have assumed that as his requested level of service and route had gone unchallenged, it had been effectively 'approved'. The FC team believed that the Typhoon (B) formation would trail/follow the (A) formation ahead which passed to the E of Newcastle clear of the airway. This was not the case so when (B) formation was seen heading towards L602 and the B737, the FC mentor (Sup) should have taken positive control and turned the flight L.. This is because when the formation entered CAS the stipulated separation of 10nm needed to be applied and maintained between (B) formation and the descending B737. This was not done and had in the Board's opinion caused the Airprox.

The Tay team had seen the Typhoons approaching CAS and issued avoiding action to the B737 flight. The crew requested Tay Tactical to repeat the instruction which was then correctly acknowledged. The B737 crew 'saw' the Typhoons pass to their R on TCAS as a TA alert was generated. Typhoon (B) Lead had been given TI by the FC and visually acquired the B737 7nm away and then followed the FC's L turn instruction away from the airway. This visual sighting was enough to allow the Board to conclude that any risk of collision had been effectively removed.

AIRPROX REPORT No 2009-007

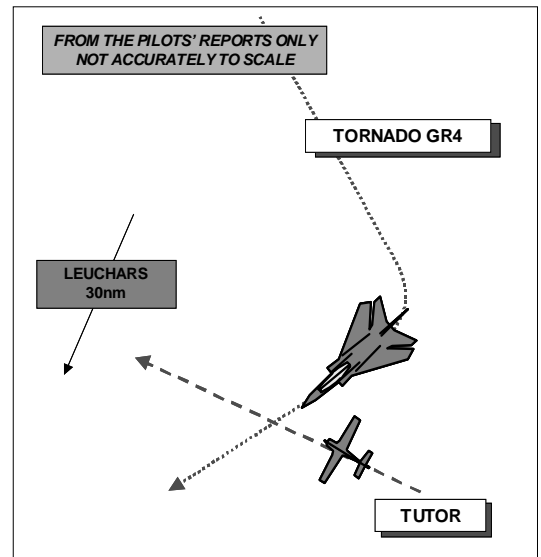
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The FC mentor did not ensure stipulated separation between Typhoon (B) formation and the B737.

Degree of Risk: C.

AIRPROX REPORT NO 2009-008

Date/Time: 17 February 1356
Position: 5642N 00238W (5nm W Montrose)
Airspace: UKDLFS (Class: G)
Reporting Ac Reporting Ac
Type: Tornado GR4 Grob Tutor
Operator: HQ Air (Ops) HQ Air (Trg)
Alt/FL: 350ft agl 500ft agl
(RPS 1019mb) (RPS 1019mb)
Weather VMC CLBC VMC CLBC
Visibility: 40km >10km
Reported Separation:
50-100ft V/50ft H 50-100ft V/30m H
Recorded Separation:
NR



BOTH PILOTS FILED

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE TORNADO GR4 PILOT reports that although he planned the sortie as No2 of a tactical low level pair flying in LFA14, his leader had a technical problem that prevented him from getting airborne. As he approached the incident area he was flying the No2 track of a practise co-ordinated shallow dive attack on a simulated target. He was squawking 7001 with Mode C and listening out on UHF Guard, Leuchars APP and the LFS frequency; TCAS was not fitted and he commented that had it been, it would have helped him acquire the other ac. His ac was displaying nav and white strobe lights. Immediately prior to the incident he was flying at 350ft Rad Alt about 5nm W of Montrose and had just turned onto a heading of 240° towards the Initial Point (IP) for his attack. He was accelerating through 450kt and described his workload as being medium as he had acquired the IP early. Just after a turn he (the pilot) saw a Tutor ac appear suddenly in his 11 o'clock about 200m away. The Tutor was white against a white background; was on a constant bearing and therefore was very difficult to see. On seeing the Tutor he initiated a slight wings-level bunt and it passed about 50-100ft in front of them and 50-100ft above. He assessed the risk as being high and reported the incident over the RT to Leuchars APP.

THE GROB TUTOR PILOT reports he was flying solo in a white ac with lights and strobes switched on at 500ft agl (visually) on a slow-speed fighter affiliation training sortie, acting as a singleton target for a 2-ship of Tornado F3s. He was squawking a Leuchars conspicuity code with Mode C and in receipt of a FIS from them [on a different frequency to the GR4] but TCAS was not fitted. At the time of the incident he was heading 280° at 120kt and being tracked by the F3s in turn and had full freedom to manoeuvre. He heard Leuchars APP passing information to the F3 leader about a Tornado GR4 operating in the vicinity and very shortly after, he saw a GR4 pass beneath and very slightly behind him, travelling into his 10 o'clock. It was too late to take any meaningful avoidance.

He contacted the GR4 crew after landing and thereafter reported the incident by telephone, assessing the risk as being high.

The F3 formation informed him after the event that they had the incident on radar so he contacted Sqn Ops on landing to ask that the recording be retained. [UKAB Note (1): The information is not recorded in a format that can be used by the UKAB].

UKAB Note (2): The position of the incident passed by the 2 pilots differed by about 10nm but since it took place below the base of recorded radar cover, it was not possible to determine the precise position; the local terrain or determine accurately the separation between the ac.

AIRPROX REPORT No 2009-008

HQ AIR (OPS) comments that the GR4 pilot did well to spot the Tutor against a light background with sufficient time to take avoiding action. It is disappointing that the TI passed to the F3s was not sufficiently detailed to alert the Tutor pilot to the proximity of the confliction.

HQ AIR (TRG) comments that the reported separation distances reported by both pilots are very similar and therefore can be assumed to be accurate in the absence of supporting radar data. The problem of seeing a light-coloured, relatively slow moving ac against a light background is well known; likewise visually detecting a high-speed camouflaged ac at low-level is equally difficult. With his workload increasing the Tornado pilot did well to see the Tutor, albeit late, and was able to take 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, reports from the air traffic controllers involved and reports from the appropriate ATC and operating authorities.

Despite there being no radar recording, this incident was relatively straightforward to reconstruct since the Tornado unit helpfully provided copies of the GR4 pilot's route map.

Both ac involved in this incident had been operating legitimately at Low Level near Montrose on their respective fairly demanding tasks. In these circumstances 'see and avoid' is the principal method of collision avoidance.

The Board observed that the GR4 crew were in a high workload situation concentrating on their simulated attack run. Early acquisition of the IP had most likely allowed the pilot to conduct his lookout scan. The Tutor pilot too had been busy, acting as a simulated low level target for the F3s. Although perhaps later than optimum, both pilots did see the opposing ac and the GR4 pilot had sufficient time to avoid the Tutor. Whilst this had removed the risk of collision, the Board considered that there had been a degradation of normally accepted safety standards.

The poor visual conspicuity of the Tutor is well known and documented and the HQ Air (Trg) Member briefed the Board on portable electronic SSR-based collision warning devices being considered for their ac.

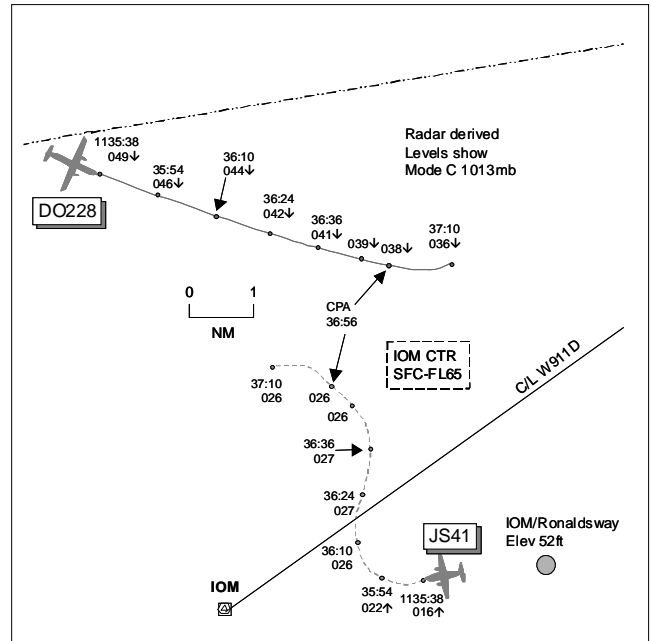
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in the UKDLFS resolved by the Tornado GR4 pilot.

Degree of Risk: B.

AIRPROX REPORT NO 2009-010

Date/Time: 16 Feb 1137
Position: 5408N 00443W (5nm NW IOM
 - elev 52ft)
Airspace: IOM CTR (Class: D)
Reporter: IOM APR
1st Ac 2nd Ac
Type: JS41 DO228
Operator: CAT CAT
Alt/FL: 3000ft ↓3000ft
 (QNH 1026mb) (QNH 1026mb)
Weather VMC CLOC VMC CLOC
Visibility: 10km
Reported Separation:
 APR: 1000ft V/2. 7nm H
 1000ft V/4nm H Not seen
Recorded Separation:
 1200ft V/2nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE IOM APR reports that at 1133 ADC called him for a release on the JS41 to Newcastle. As he was vectoring the DO228 downwind RH descending to 3000ft, he released the JS41 to climb straight-ahead and stop climb 3000ft as he also had transiting traffic at FL40. At 1136 he called ScACC for further climb on the JS41 and was given FL110. At this time the JS41 flight checked in on frequency and he saw the ac climbing through 1800ft in a R turn towards DCS VOR, the normal routeing for this flight. He immediately gave the JS41 avoiding action, a L turn heading 270°, and the ac was seen to start the L turn with separation at the CPA of 2.7nm horizontally and 1000ft vertically. He also gave the DO228 a L turn onto 050° and was about to stop its descent when it became clear that the turn had resolved the conflict. He did not give TI, as he perceived that neither crew would see each other's ac and the situation was already resolved. Once clear of traffic the JS41 was climbed to FL110 direct to DCS and was transferred to ScACC. The DO228 made a visual approach to RW26 and landed without further incident.

THE JS41 PILOT reports outbound to Newcastle IFR and in receipt of a RCS squawking with Modes S and C. Whilst on the parking stand they were given a clearance of 'noise abatement then intercept W911D to DCS climbing FL70'; this was heard by both crewmembers and was verified. They were told to backtrack the RW and during a 180° turn their clearance was amended to 'local restriction after departure maintain 3000ft'; this clearance was read back and discussed. The amended clearance was given whilst the Captain was engaged in turning the ac through 180° at the threshold, avoiding the RW edge using differential braking and avoiding the prohibited RPM range using differential power. Take-off clearance was given and after noise abatement to 3000ft, a R turn was commenced to intercept W911D. Transfer to Radar was given and on initial contact heading 055° at 200kt and levelling at 3000ft they were told 'avoiding action turn L heading 270°'. TCAS was monitored but no alerts or warnings were received but traffic was seen on TCAS to pass about 4nm away and 1000ft above. After discussing the incident with ATC, he had no recollection of being asked to maintain RW heading. He assessed the risk as low.

THE DO228 PILOT reports inbound to IOM Ronaldsway IFR and in receipt of a RCS squawking 5065 with Modes S and C. The incident occurred during the initial/intermediate descent to 3000ft at 200kt whilst under radar vectors prior to accepting a visual approach for landing. A L turn onto heading 050° was given after other traffic in their vicinity was overheard being assigned a new heading of 270°. They complied with the new heading and subsequently carried out a standard approach and landing. No TI or conflict resolution commands were given to them by ATC. The ac was not fitted with ACAS/TCAS/TAWS systems so they were unaware of the occurrence u

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

IOM INVESTIGATIONS reports the incident occurred at approximately 1137Z between an outbound JS41 and an inbound DO228 during the provision of a RCS to both flights in the IOM Class D CTR.

ADC reports that after being given start up and airways clearances (1125:54) the JS41 flight was subsequently issued with taxi clearance (1130:08) that involved a non-standard routeing to enter and backtrack the RW in use. [Airways clearance issued was 'JS41 c/s cleared to Newcastle via W911D climb FL70 squawk 5447' which was read back correctly.] The crew of the JS41 queried this taxi routeing (1130:36) with ATC, as they would normally expect to taxi to the holding point for RW26 via the parallel taxiway. ADC could not remember the exact reason why he specified this non-standard routeing but commented that he was aware of APR working inbound traffic and therefore thought that he may have decided upon this course of action in an attempt to expedite the departure of the JS41.

As the JS41 approached the departure threshold, ADC contacted APR by intercom (1133:03) to request a release and APR included a departure restriction of "...stop him at altitude 3000ft and straight ahead please". This addition to the previously issued airways clearance was transmitted by ADC to the JS41 (1133:30) as "JS41 c/s local restriction after departure climb straight ahead stop climb at altitude 3000ft". The pilot acknowledged the instruction and read back (1133:37) "after noise abatement climb straight ahead stop climb at altitude 3000ft JS41 c/s". ADC then cleared the JS41 crew for take off (1133:48) and approximately 90sec later the flight was transferred to the APR frequency (1135:20). ADC did not recall seeing anything untoward on the ATM and the ac appeared to be following the standard noise abatement track (climb straight ahead for 2 miles). He did not become aware of any problem until he heard APR use the words 'avoiding action' from the loudspeaker monitoring the APR frequency in the VCR.

When ADC requested the release on the JS41 (1133:03), APR was already positioning the inbound DO228 for a RH cct for an ILS approach to RW26 and the flight had been instructed to descend to altitude 3000 feet. Additionally APR was in control of a flight of 4 loosely spaced Puma helicopters transiting the CTR at FL40. He was aware that the standard routeing for an ac departing to DCS on W911D would normally have been a R turn out after departure but on this occasion, due to the other conflicting traffic, was undecided as to whether the most efficient turn on track would involve a R or L turn following departure. He therefore issued ADC with the release involving a climb straight ahead and also a level restriction of not above altitude 3000ft to ensure separation from the transiting Pumas. His plan would then involve assessing the ROC by the JS41 at which time he would issue further tactical instructions to maintain separation from the transiting Pumas and also allow the JS41 to safely climb through the level both of the Pumas and the inbound DO228. To facilitate this course of action APR then telephoned the Antrim Controller at the Scottish ACC (1135:08) to coordinate a level above the standard FL70 for the departing JS41 and was given a higher level of FL110.

On first contact with APR (1135:54) the pilot of the JS41 reported "Radar gooday JS41 c/s passing altitude 2600 climbing 3000ft and we're on a, just coming up to intercept the W911D". At the same time APR reports having observed the JS41 passing altitude 1800ft in a R turn towards the normal outbound track to DCS. APR issued the JS41 with avoiding action (1136:08) "JS41 c/s avoiding action turn left immediately heading of 270°" and this instruction was acknowledged immediately by the crew of the JS41. Some 5sec later (1136:23) APR instructed the JS41 flight to continue the L turn onto a heading of 250° which was again acknowledged immediately by the JS41 crew. APR then instructed the DO228 flight to turn L from their previously assigned heading of 110° onto a heading of 050° and this was acknowledged by the crew of the DO228.

TI was not passed to either crew.

Once APR had observed that the risk of collision had passed, he instructed the JS41 flight to climb to FL110 (1137:14) and resumed vectoring the DO228 for an ILS approach.

APR confirmed with the crew of the JS41 that they should have climbed straight ahead after departure (1137:35) and the pilot replied *"we were just given a block of 3000 that's all"*. APR then instructed the JS41 crew to turn R onto 050° (1137:46) and subsequently instructed the flight to resume own navigation to DCS (1139:20) before being transferred to Scottish Control (1140:50).

The incident involved a loss of separation that led APR to consider that a possible risk of collision existed between the departing JS41 and the DO228 joining downwind and he therefore issued avoiding action to the JS41. He was aware that the instruction did not contain TI on the conflicting ac but stated that he wanted to ensure a response from the JS41 crew as quickly as possible. The JS41 was observed to commence an immediate turn that resolved the potential conflict and he therefore did not issue any TI to the DO228.

ADC was aware of the guidance contained in MATS Part 1 regarding restrictions on using an active RW for taxiing purposes. [MATS Part 1 Section 2 Chapter 1 Para 9.3 Taxi Clearance states *"In the interests of safety, use of the active runway for taxiing purposes is to be kept to a minimum."*] At the time of the incident there was work in progress on the airfield that necessitated departing ac to backtrack the RW for 08 departures and it may be that ADC inadvertently gave the JS41 flight the instruction to backtrack RW26 as a result of this temporary practice. Regarding the timing of the instruction that contained the "local restriction" ADC accepted that this would normally have been given at or before the holding point.

THE IOM DIRECTOR OF CIVIL AVIATION reports and endorses the follow-up action taken, as follows: a) The ATC Training Manager, in conjunction with the appropriate LCE, ensured that the APR and ADC controllers involved in the incident were fully debriefed and made aware of the content of the investigation. b) The ATC Training Manager ensured that refresher training was carried out. c) The Manager ATS and ATC Training Manager ensured that findings of the investigation were promulgated within IOM ATC as a training opportunity for all.

UKAB Note (1): The IOM/Ronaldsway Radar Display System converts FLs to altitudes at 3000ft or below. The IOM QNH is input into the system and FLs are shown as 3 digits and altitudes as 2 digits preceded by an A i.e. A20 for altitude and 115 as a FL.

UKAB Note (2): The St Annes radar recording at 1135:38 shows the JS41 first appearing on radar 1.9nm WSW of Ronaldsway tracking 260° climbing through FL016 (approximately 2000ft QNH 1026mb) with the DO228 8nm to its NW tracking 105° descending through FL049 (5300ft QNH). As the JS41 flight makes its initial contact call to the APR at 1135:54 the ac is seen to have commenced a R turn climbing through FL022 (2600ft QNH) with the DO228 6.7nm to its NW descending through FL046 (5000ft QNH). Just as the APR issues the JS41 an avoiding action L turn onto 270° the radar shows, at 1136:10, the JS41 at FL026 (3000ft QNH) turning R through N 5.5nm SSE of the DO228 descending through FL044 (4800ft QNH). The JS41's turn reversal is seen to take effect at 1136:24, as the APR issues the JS41 flight with a further L turn onto 250°, the ac is now at FL027 (3100ft QNH) and 4.3nm distant from the DO228 which is descending through FL042 (4600ft QNH). Twelve seconds later the JS41 is turning L through N at FL027 (3100ft QNH) with the DO228 in its 12 o'clock range 3.25nm crossing from L to R descending through FL041 (4500ft QNH). The CPA occurs at 1136:56 as the ac pass starboard to starboard both turning L range 2nm, the JS41 level at FL026 (3000ft QNH) with the DO228 indicating FL038, 1200ft above and descending.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

From the IOM RT recording it was clear that the local departure clearance to climb straight ahead as issued by the ADC had been read back correctly by a JS41 crewmember but, for whatever reason, this was not actioned. This had led to the JS41 turning into conflict with the DO228 after departure, causing the Airprox. Although the timing of the passing of the local clearance was not ideal, ATCO Members were aware that situations like these do happen on occasions, owing to tactical necessities, but are captured normally within existing procedures. The JS41 crew had erroneously turned R to intercept the C/L of W911D, whilst climbing to 3000ft, towards the DO228 descending to the same level as it positioned RH downwind to the N of Ronaldsway. Fortunately the APR noticed the JS41's R turn early and had instructed the crew to turn L onto 270° for avoiding action. The APR also gave the DO228 crew a L turn onto 050° away from the JS41, the DO228 at the time being about 1500ft above and

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descending slowly. The radar recording revealed that the ac had passed without any loss of standard separation. These prompt actions when combined with the actual geometry of the encounter allowed the Board to conclude that any risk of collision had been effectively removed.

PART C: ASSESSMENT OF CAUSE AND RISK

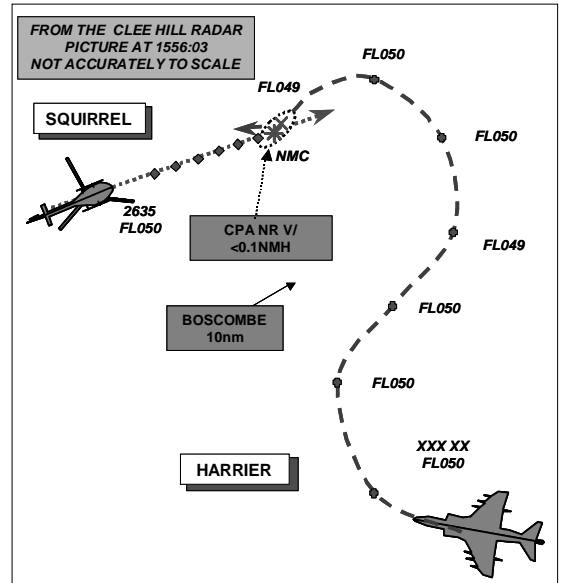
Cause: Despite reading back their local clearance correctly, the JS41 crew did not climb straight ahead and turned into conflict with the DO228.

Degree of Risk: C.

AIRPROX REPORT NO 2009-011

Date/Time: 24 February 1556
Position: 5104N 00206W (10nm SW Boscombe Down)
Airspace: Lon FIR (Class: G)
Reporting Ac Reported Ac
Type: AS350 Squirrel Harrier GR9a
Operator: HQ AAC ATEC
Alt/FL: FL050 FL050

Weather VMC CLAC VMC CLAC
Visibility: >20nm >50km
Reported Separation:
 Nil V/30m H 100ft V/200m H
Recorded Separation:
 100ft V /0.1nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE AS350 SQUIRREL PILOT reports flying a training sortie from Exeter to Middle Wallop in a black and yellow ac with HISLs and Nav lights switched on, in receipt of a RIS from Boscombe Zone and squawking as directed with Mode C. They were in the cruise, heading 070° at 100kt, in very good visibility well above a cloud layer when Zone reported a fast moving contact at 4nm to the S of them in their 3 o'clock; on looking they immediately saw the ac. The fixed wing traffic was heading in a similar direction as themselves and was overtaking them quickly at the same level. One min later the other ac commenced a hard turn to port and they continued to watch it as it continued the turn towards them. The expected roll out of the turn did not happen and the contact, now identified as a grey Harrier, continued to turn directly towards them and it was clear there was about to be a conflict. With a closing speed of about 300kts the ac was very rapidly turning onto a head on collision course at exactly their level. However, just in time the pilot began to ease off the bank sufficiently and passed 50-100ft down their starboard side [UKAB Note (1): the radar recording shows the Harrier passing down the port side as reported by its pilot]. The easing of bank was leisurely and he did not believe that it was to avoid collision but coincidental. Had the turn not been reduced he thought that they would impacted about one second later. It was impossible to predict the ac flight path relative to their own until very late indeed and a break left or right might have made the situation worse. By then a descent would have been too slow and a climb would have obscured their vision. Nevertheless he was about to initiate a rapid flare induced climb when the Harrier eased its bank.

He considered this to be a very serious incident indeed and by far the most dangerous that he had encountered in 37 years of flying.

From the way that Boscombe Zone reported the Harrier's position it was clear it was not on the same frequency and he heard no calls to the Harrier regarding his ac.

He assessed the risk as being very high and reported the incident to Boscombe Zone at the time.

THE HARRIER GR9A PILOT reports flying a grey ac with HISLs switched on on a local test flight from Boscombe Down, in receipt of a RIS initially from Boscombe then London Mil and squawking as directed with Mode C. He was conducting some prolonged steady turns at FL50 as part of a trial sortie requiring 30 to 40sec of sustained turn at between 3 and 4g, typically involving a full 360° turn. He had been handed to London Mil at about 1551 in anticipation of a climb test point to FL300. At about 1554 he was informed of a slow moving radar contact, 5nm W of his position so on termination of his test point, he flew steady on a heading of 075° for 20sec prior to commencing his final test point before the climb. His final test point was a 3.5g turn to the left at FL50, initiated at 1555:53 and while passing through 225° he spotted a black and yellow Squirrel Helicopter ¼ nm away in his left

AIRPROX REPORT No 2009-011

11 o'clock very slightly above, so he initiated a roll out to wings level to pass behind it. The HUD video of the sortie was kept but the audio was unusable.

He assessed the risk as being high.

MIL ACC reports that a black and yellow Squirrel helicopter was level at FL050 transiting to Boscombe Down for a PAR to RW23 and was receiving a RIS from Boscombe Down Zone (LARS) on a VHF frequency. A grey Harrier GR9A had departed Boscombe Down on a test sortie that included several sustained 3 to 4g turns in level flight before requiring an unrestricted climb to FL300. The GR9A had been handed to LJAO W/SW on a UHF frequency for the GH prior to the unrestricted climb and was in receipt of a RIS from them.

The Squirrel was handed to LARS [VHF] for a PAR at 1553:13, placed under a RIS 8sec later, *'C/S LARS good afternoon identified FL050 Radar Information'* which the pilot acknowledged. Having confirmed with the pilot that the instrument recovery was to Boscombe Down rather than Middle Wallop as originally thought, the airfield information was passed as, *'C/S, err, the Boscombe information code Lima, runway 23, surface wind calm, colour code white, fully serviceable, QFE1013, do not set until advised'*.

The radar replay shows the GR9 on radar throughout the incident. It departed Boscombe Down on a 2615 squawk, the first Mode C showing it climbing through FL035. At 1550:58 the code changed to 3357 while the Mode C indicated FL046 before levelling at FL049. At 1554:27 Zone instructed the Squirrel pilot to recycle his SSR, *'C/S, roger recycle squawk 2634'*. At that time the GR9 was in its 2 o'clock tracking S having completed the first hard left hand orbit with its Mode C indicating FL050. At 1554:46 Zone transmitted, *'C/S, err, roger, pop up traffic, south 5 miles, tracking North West, indicating, err, co-alt, fast moving.'* At that time the GR9 was in the helicopter's 2 o'clock still in a left hand orbit and the measured distance was then 7nm. The GR9 completed a second 270° left hand orbit before briefly rolling out on a heading of 270°; at 1554:15 the London Mil controller passed the pilot TI, *'C/S traffic right 2 o'clock five miles manoeuvring indicating similar level'*. This was just before the GR9 commenced a 3rd left hand orbit, this time rolling out briefly on a heading of 330° whereupon a reverse turn was commenced onto 060°. At that time the range between the Squirrel and the GR9 had reduced to 3nm and they were still converging co-level. The Squirrel pilot reported at 1555:00, *'And, err visual with traffic, C/S'*. No further TI was passed by either controller.

Both pilots were in receipt of a RIS while operating in Class G airspace and should have expected accurate and timely TI to be passed to provide adequate situational awareness for the safe conduct of their respective flights. Although the LARS controller concentrated on administration calls rather than passing early TI to the Squirrel pilot, he did eventually pass TI, albeit as a cardinal bearing to the Squirrel flying straight and level, referring to pop up traffic rather than his own late sighting.

The GR9 was always a conflict with the Squirrel from the moment it departed Boscombe Down. Pop up traffic usually relates to traffic climbing into radar cover - however the GR9 was in solid radar cover throughout the incident. The London Mil Controller, although working to medium intensity, passed accurate TI but he used a clock code method when the GR9 was conducting high-energy manoeuvres. This did not allow the pilot to acquire the Squirrel early and the TI was not updated, despite STCA activating. As the distance between the ac reduced to 0.3nm on the radar replay, the Squirrel pilot was able to acquire the GR9 visually from the TI passed by LARS but the GR9 pilot closed within a quarter of a mile before becoming visual.

As a result of this incident, both controllers were reminded of the importance of timely and accurate TI.

UKAB Note (2): The recordings of the Heathrow and the Clee Hill radars show the incident throughout. The Harrier can be seen climbing out of Boscombe Down and flying a series of High Energy manoeuvres 10nm to the SW of the airfield. The helicopter remains on a steady track of 065° at FL050 throughout, its squawk changing from 0232 (Yeovilton) to 2656 (Boscombe Down) at 1552:43 and then to 2634 at 1554:59. At that time the Harrier is in an orbit in the helicopter's 3 o'clock at a distance of about 3nm and at the same alt. The Harrier rolls out of the orbit at 1554:58, initially heading 290° before turning hard right onto 050° briefly before commencing a further tight orbit to the left at 1555:38 from a position in the helicopter's 3 o'clock. When the Harrier is in the helicopter's 12 o'clock at a distance of 0.3nm it rolls out of the turn and passes down the helicopter's left side about 100ft below it. Although the Clee Hill shows the incident more clearly, Mode C of the Harrier drops on the sweep before the CPA. However, the Heathrow shows the helicopter to be at FL050 and the Harrier to be at FL049 on both the sweep before the CPA and that of the CPA.

MOD FTR did not comment.

HQ AAC comments that the AS350 pilot was justified in feeling very threatened by the manoeuvring Harrier.

Boscombe Zone could have held the Harrier on its frequency in the knowledge that the inbound Squirrel was at the intended operating level of the Harrier. However this was not done and the Harrier – having been advised of the Squirrel – chose to continue to manoeuvre at the same level. Further, the questionable TI calls from both controllers appear to have compounded the situation such that the late sighting by the Harrier pilot – and subsequent ‘measured’ action – brought both aircraft into close proximity.

This was an avoidable incident from which salutary lessons should be learned.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board noted that both ac had been operating legitimately in the Class G airspace of the open FIR near Boscombe Down and consequently the ‘see and avoid principle’ had applied. Notwithstanding this, Members observed that both pilots had wisely requested an ATS to assist them with their responsibility. However, the assistance provided to the Harrier pilot by the London Mil controller, although technically in accordance with regulations, was minimal, not fully accurate and did not enable the pilot to see the helicopter in sufficient time to give it a sufficiently wide berth.

The TI provided by Boscombe Zone to the Squirrel pilot had been more accurate and informative but it was not passed as soon as the information was available to the controller. Specialist controller Members agreed with the MIL ACC Advisor that although the London Mil Controller had been moderately busy, his division of attention had been less than optimal. One Test Pilot Member, supported by an ex-West Drayton Controller Member, observed that due to the high workload encountered on trial flights and the complex profiles often flown, in the past a controller with sole responsibility for such flights was allocated (the Special Task Cell). Both Members agreed that there was merit in this procedure that had previously proved most dependable. Controller Members observed that in this case since the London Mil Controller had been busy working several other ac as well as the Harrier, such a procedure would have enabled him to pay significantly more attention to the trial ac. Notwithstanding, Members agreed that while manoeuvring at FL50 close to Boscombe Down, LARS would have been a better option for the Harrier than London Mil as the former would have had much better awareness of the local traffic situation. However, the flight profile of the helicopter was unvarying and it should have been obvious to both controllers that if no avoidance were taken it was likely that the ac would conflict whilst simple, co-ordinated action would prevent the ensuing conflict.

Notwithstanding the controlling inadequacies however, in this case the pilots had been responsible for the avoidance of the other ac. Since the Harrier had been manoeuvring rapidly in the horizontal plane and notwithstanding that he was flying a trial, Members agreed that the Harrier pilot should have cleared the airspace ahead of him and given way to the helicopter.

In addressing why the Harrier pilot had not seen the helicopter, Members agreed that he might have believed from the TI that it was relatively static and manoeuvring and that his 20sec roll out on 075° would provide sufficient displacement of over 2nm. This would have taken him well clear and therefore he might have dismissed the helicopter from being a threat. Further, when the Harrier pilot commenced this turn to the left, the helicopter would have been almost head-on and would have been a very small target to acquire visually. However, the Harrier pilot did see the helicopter, albeit very late at a distance of ¼nm, and was able to increase the small amount of separation (vertical only) already existing by reducing his bank angle by enough to also pass over 100m behind it. That being the case the Board agreed that the Harrier pilot had removed any risk of collision but that safety margins had been reduced significantly.

AIRPROX REPORT No 2009-011

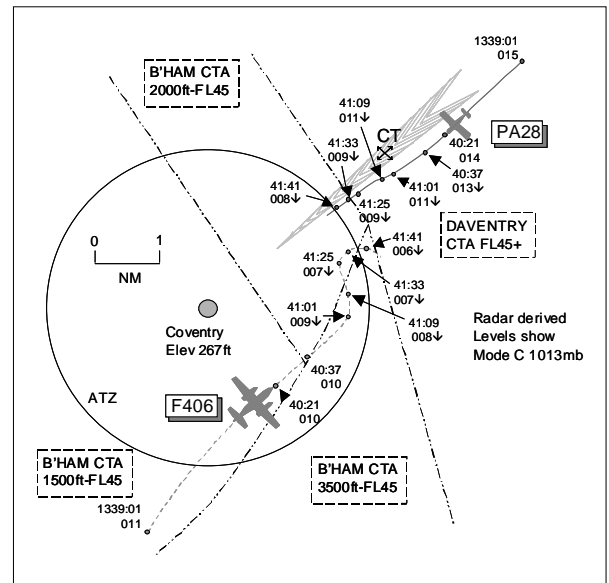
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A late sighting by the Harrier GR9 pilot.

Degree of Risk: B.

AIRPROX REPORT NO 2009-012

Date/Time: 26 Feb 1342
Position: 5224N 00125W (2nm FIN APP RW23
 Coventry - elev 267ft)
Airspace: ATZ (Class: G)
Reporting Ac Reported Ac
Type: F406 Caravan 2 PA28
Operator: Civ Comm Civ Trng
Alt/FL: 1300↓
 (QNH 1022mb) (QNH)
Weather VMC CLOC VMC CLOC
Visibility: >10km
Reported Separation:
 Not seen Not seen
Recorded Separation:
 200ft V/O-8nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE F406 PILOT reports returning to Coventry from a local sortie and in communication with Coventry Tower on 118.175MHz squawking with Modes C and S. The visibility was >10km in VMC with NSC and the ac was coloured white/green with strobe lights switched on. Joining LH downwind RW23, ATC told her there was PA28 traffic on the ILS at 5nm and she was asked to report ready for L base. Ready to turn base, ATC told her the ILS traffic was at 3nm and she could continue as No 1 in traffic if keeping it tight; the base turn was immediately commenced. Configured at 130kt and in the turn to establish onto L base, ATC said 'This is not going to work' and informed her that the speed of the ILS traffic had been greater than anticipated and she was instructed to orbit. She carried out a RH orbit as she deemed it to be the quickest and safest way to exit the FAT. ATC enquired whether she had turned L or R and she replied R. The Tower controller urged her to tighten the turn to avoid conflicting traffic with which she was not visual at any time. As she was about 1.5nm out approaching the FAT she assumed this is where the Airprox occurred. She was unable to assess the risk as she did not see the other ac.

THE PA28 PILOT reports being unaware of being involved in an Airprox until after being contacted a week later by the UKAB. The sortie profile was an IMC training flight from Wellesbourne routing to Coventry for an NDB hold and approach before returning to Wellesbourne. He was working Coventry Tower on 122.9MHz during the approach and did not see the reporting ac whilst on final.

THE COVENTRY ADC completed his CA1261 10 days post incident after returning from holiday so he considered that his recollections could not be regarded as being accurate. He reported that he was advised by Radar that the F406 was joining downwind LH from the SW and there was a PA28 on an ILS approach [he thought; actually an NDB] believed to be more than 5nm out on the approach as informed by Radar. He passed TI to both flights, he thought, and asked the F406 pilot to report ready for base leg. The F406 pilot reported 'ready' earlier than usual and the PA28 was believed to be more than 3nm on approach. He advised the PA28 pilot of being No2, he thought, previous traffic turning early No 1. He told the F406 pilot to turn base immediately being No 1 and once again passed TI. It then appeared that the PA28 was faster on approach than usual for this ac type. As he could see out of the VCR window that the F406 had not turned immediately as instructed and acknowledged, he then told the F406 pilot to orbit L, he thought, away from the approach but instead the F406 turned R. He again passed TI to both flights, he thought, and told the F406 pilot she was No 2 to the PA28. Further manoeuvres were normal.

ATSI reports that Coventry Airport is situated within an ATZ which is partly in Class D airspace of the Birmingham CTA (base altitude 1500ft to the W and S of Coventry Airport and 2000ft to the E and NE) and the remainder in Class G airspace. The ATZ is a circle radius 2.5nm, centred on RW05/23, with vertical limits of surface to 2000ft aal, the airfield elevation being 267ft. The Airprox occurred in Class G airspace. The UK AIP states (AD 2-EGBE-

AIRPROX REPORT No 2009-012

1-11) that *"Due to the complexities of adjacent controlled airspace, pilots are reminded to ensure that their flight remains clear of the Birmingham CTR/CTA unless ATC clearance is issued"*.

The 1320 Coventry METAR: 250/08kt, 220 variable 280; 9999; FEW 015; +8 +4; QNH 1022. The RW in use at Coventry was 23. The ADC described his workload as medium at the time of the Airprox. The Coventry VCR is equipped with an Aerodrome Traffic Monitor (ATM) which displays both primary and secondary radar information.

The PA28 pilot had booked a VFR training detail of 2 holds and an NDB approach, followed by a missed approach, at Coventry. The flight contacted Coventry Approach at 1254, reporting inbound from Wellesbourne for its training detail. The pilot was instructed to squawk 0260, the Coventry conspicuity code. (This was, subsequently, changed to 0263.) The ac entered the hold at the CT NDB (situated on the final approach RW23, 3.25nm from the threshold) at its cleared altitude of 2500ft. At 1330, the pilot requested to carry out an NDB procedure next time over the NDB and was requested to report 'Beacon Outbound'. At 1332:30, the Radar controller telephoned the ADC to inform him that the PA28 was outbound for an NDB approach. Subsequently, at 1333, the PA28 flight was cleared for the NDB approach, to report 'Base Turn Complete' (BTC).

At 1334, the F406 flight, flying VFR, requested joining instructions on the Approach frequency. It was requested to squawk the Coventry conspicuity code 0260 and informed it was being provided with a FIS. The pilot was requested to report at Southam, a VRP at a cement works approximately 7nm SE of Coventry Airport, and was advised about aerial activity at Wellesbourne and Snitterfield. The pilot reported visual with both airfields and was informed *"I may be able to get you a downwind lefthand join"*. The Radar controller telephoned the ADC to advise him of the F406's position, between Snitterfield and Wellesbourne, and to request a downwind LH join. This was approved and the flight was transferred to the Tower frequency at 1336:59.

Approximately 30sec after the F406 had been transferred, the PA28 pilot reported BTC. The flight was instructed to descend on the procedure and to contact the Tower frequency.

The F406 flight established communication with Aerodrome Control at 1337, when it was about 7nm SW of the airport. The pilot was requested to *"join downwind report upwind with the threshold"*. Forty seconds later, the PA28 flight (on final approach at 8nm) made its initial call on the frequency, reporting descending on the procedure. It was cleared to continue its approach for RW23. At 1339:07, the F406 flight, approximately 4nm SSW of the airport, reported *"just approaching an early downwind left two three"*. The pilot was instructed to *"report ready for base leg, traffic is a Cherokee instrument approach at five miles"*. The ADC later said that, depending when the F406 pilot reported ready for base leg, he would decide the approach order between the subject ac. On reporting ready for L base, at 1340:40, the pilot was asked *"are you happy to keep it tight that traffic now three miles"*. The pilot replied *"affirm"* and was instructed to report on final approach i.e. ahead of the PA28. The radar shows the F406, with an indicated GS of 149kt, 1.7nm SE of the airport at FL010 (1270ft QNH 1022mb). NB Any further reference to speeds is taken from the indicated GS shown on the radar recordings of the incident available to ATSI. The ADC recollected that he had not chosen ac speeds to be displayed on the ATM. The PA28 is on approach, just L of the extended RW C/L, 3.7nm from the F406, at FL013 (1570ft QNH), speed 88kt. It would appear, from the radar recordings, that the F406 commenced its turn on to base leg at approximately 1341:00.

Shortly afterwards, at 1341:12, the ADC decided to change his plan. He explained that he made the decision because the F406 had not turned as quickly as he anticipated and the PA28 was travelling faster than he expected. He transmitted to the F406 *"(F406 c/s) that's not gonna work if you can make an orbit please reposition downwind that traffic's fast moving two and a half miles now"*. The pilot acknowledged the call using just the c/s. The radar shows the F406, at FL008 (1070ft QNH) and 143kt, turning towards L base. The PA28, passing FL011 (1370ft QNH) and at 91kt, is 1.9nm away. The controller believed he had instructed the F406, as he intended, to orbit L, away from the PA28. Consequently, observing the F406 turning R, (he confirmed he could see both ac) he asked the pilot *"Just confirm you're entering the lefthand orbit"*. The pilot continued *"negative we're turning right now"* and was advised *"quite an acute right turn then please have traffic on the instrument approach"*. The controller requested *"Are you visual with the Cherokee two miles now"*. The pilot responded *"Negative"*. The radar, timed at 1341:25, shows the F406 in a R turn, 1.2nm from the PA28. Their speeds are 138kt and 91kt and levels are FL007 (980ft QNH) and FL009 (1180ft QNH) respectively. By 1341:33, the CPA, the tracks of the two ac are no longer conflicting, as the F406 continues its R turn and passes 200ft below the PA28, separated by 0.8nm.

The PA28 pilot was not informed about the F406 joining final ahead of him. The controller later explained that he intended to issue TI to the PA28 pilot but decided to delay passing it until he knew the approach order. Thereafter,

he was concentrating on the position of the F406 and, he believed, dealing with another operational matter, and did not issue the information as intended. It was only after the F406 had turned away from the PA28 that the ADC contacted the latter's pilot *"there was traffic hoping to position in front you quite tight but I see you're quite fast moving on the approach clear low approach and go around Two Five Zero Eight knots VFR"*. After the pilot read back the clearance, the controller transmitted to the F406 *"if you can turn back onto the approach you see that traffic now now one mile final"*. The pilot acknowledged the call. Subsequently, the PA28 was transferred to the radar frequency and the F406 positioned back onto final approach No 1. Once the F406 had landed, the controller explained *"I would have let you come a bit closer but that instrument traffic was quite fast on the approach and actually he was almost pulling a hundred would have ????? on the approach and er obviously I ????? ????? didn't want it to er didn't want it so close so er that's why I made the call for you to re- to reposition"*. (Several words were unintelligible.)

The MATS Part 1, Section 2, Chapter 1, Page 1, states the responsibilities of Aerodrome Control: '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'. There is no requirement to separate VFR flights.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

ATCO Members agreed that the Airprox occurred owing to a misjudgement made by the ADC when he instructed the F406 to turn onto base leg, into a conflict with the PA28. The PA28's speed had been fairly constant during its instrument approach but a GA Member opined that the F406's speed had been quite high whilst joining the cct and this was thought to have exacerbated the situation. The F406 turn-in had been timely however, and shortly after this the ADC realised that the plan was not working so he told the F406 to orbit but omitted to give any turn direction. The F406 pilot elected to turn R, away from the FAT, and when this became apparent to the ADC he told the pilot to tighten the turn. Although neither pilot saw each other's ac, the instructions issued by the ADC and executed by the F406 pilot had quickly resolved the conflict, the ac passing with separation of 200ft vertically and 0.8nm horizontally. These prompt actions taken were enough to persuade the Board that any risk of collision had been effectively removed.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Coventry ADC instructed the F406 pilot to turn onto base leg, into conflict with the PA28.

Degree of Risk: C.

AIRPROX REPORT No 2009-014

AIRPROX REPORT NO 2009-014

Date/Time: 20 Mar 1245

Position: ~5630N 00140E (145nm SE of ADN)

Airspace: Offshore Safety Area(Class: G)

Reporting Ac Reported Ac

Type: AS332 EC225

Operator: CAT CAT

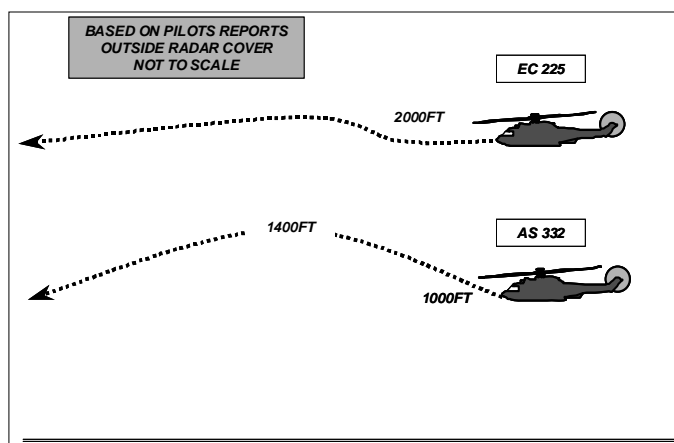
Alt/FL: 1400ft 2000ft
(QNH 1032mb) (QNH N/K)

Weather VMC CLBC NK NK

Visibility: 10km NK

Reported Separation:
~500ft V NK

Recorded Separation:
NR See UKAB Note(2).



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE AS332 PILOT reports flying an offshore support flight recovering to Aberdeen in an ac with no TCAS fitted. Some time after he had taken off from platform SEDCO714, he requested a climb from Aberdeen Information, giving their bearing and range. INFO told them that there was no known traffic to affect their climb. However INFO did not inform them that there was another ac at the same bearing and distance and 1000ft above them. He saw the other ac and stopped his climb with the other traffic crossing about 500ft above them and assessed the risk as being high. He reported the incident to the ATC Supervisor on landing.

THE EC225 PILOT reports flying an offshore support flight in the cruise, level at 2000ft recovering to Aberdeen on the 104 radial at 140nm DME, when the AS332 called Aberdeen requesting a climb. They were aware from ACAS and their own spatial awareness that the other ac was directly underneath them at 1000ft amsl. Aberdeen INFO gave the AS332 traffic information regarding two other ac in the area, one of which they could see, and then announced that there was no further traffic to affect its climb to 2000ft. They immediately informed ATC of their position and commenced a climb to 4000ft. The problem was exacerbated by the fact that the ac were initially on two different area frequencies due to the installations from which they had departed – themselves from Judy and the [subject] AS332 from SEDCO714.

This incident could have resulted in a mid-air collision and highlights the difficulties pilots and controllers face while operating in this congested area.

THE ABERDEEN CONTROLLER reports that at the time of the incident, there were several buff strips in the bay with either 098 or 104 as the inbound HMR and 2 pink strips indicating ac transiting near the field in question (i.e., crossing the 098/104 HMR).

The EC225 pilot called lifting from the Judy (for the 104HMR), requesting 2000ft and at the time there was no traffic to affect him.

An AS332 then called lifting from the Safe Caledonia (for the 098HMR) and was given traffic information on a third company ac that was transiting southbound just to the W of the field. The AS332 pilot reported visual with the traffic, at which point he moved the transiting ac's strip from above the two XXX company strips, putting it under them (to show that the transiting ac was passing the field southbound).

The AS332 involved in the Airprox then called lifting from the SEDCO714 (for the 104HMR). He gave its pilot TI on the AS332 that had just lifted to the NW [from the Safe Caledonia] and on yet another ac. At the time he considered that it was this traffic information that seemed most relevant and important but while he was reading

this back he realised that the EC225 was also potentially in conflict [with the AS332 that was lifting from SEDCO714].

Because it had been several minutes since the subject EC225 had reported his position, his immediate thought was to get a range check - the pilot reported 141miles. He [the Aberdeen controller] thought that the AS332 was at 145miles but the EC225 pilot stated he believed the AS332 was beneath him. He asked [the EC225 pilot] if he was visual and he replied that he was in IMC conditions but had a contact on his ACAS. He immediately informed the AS332 and suggested he remain at 1000ft which the pilot acknowledged, reporting at 1400ft but descending back to 1000ft.

The omission of what was probably the most relevant TI to pass to the AS332 pilot was possibly due to him being concerned about the ac transiting near the field with several lifting towards the AS332, combined with the strip positioning.

ATSI reports that at the time of the Airprox, both helicopters were in communication with the Aberdeen Rebro Sector. The Aberdeen MATS Part 2, Page HEL-5, states the Rebro Sector Organisation: 'An ATS is provided to ac operating between 1500ft and FL85 beyond 80nm east of Aberdeen to the Median Line. Offshore transmitter/receivers provide low level RTF coverage'. The sector operates outside radar coverage. There is a Memorandum of Understanding (MoU) between NATS Aberdeen and the local offshore support helicopter operators which has been amended to incorporate the recent changes to ATSOCAS. On this occasion, the subject helicopters were receiving an 'Offshore Basic Service'.

The MoU defines the provision of this service: 'Offshore Basic Service may only be provided to signatory helicopters when operating within North Sea Airspace, where surveillance services are not available. No elements of procedural 'separation' will be applied and pilots remain responsible for their own collision avoidance'. Contrary to a Basic Service as described in CAP774, 'controllers will endeavour to pass TI to participating helicopters about other relevant ac. Controllers will use the following criteria when considering whether other ac are relevant: From the information available to the controller it appears that ac are or may be less than 1000ft vertically deconflicted and are likely to pass within 10nm of each other'.

The EC225 pilot established communication with the Rebro Sector at 1239, reporting *"just lifted the Judy Platform looking to climb two thousand feet to backtrack the Zero One Four HMR (sic-104HMR) from the One Forty point with sixteen souls on board currently range one five three crossing the One Oh Six"*. The pilot was informed it was an Offshore Basic Service and there was *"nothing known to affect up to two thousand feet if that's what you're looking for back on the One Zero Four HMR"*. Information was passed about a helicopter which was routing southbound from the Montrose to the Clyde area at 500ft. The pilot reported climbing to 2000ft. (**NB.** Helicopter Main Route (HMR) 104 is an inbound route to Aberdeen, the Judy Platform being situated to the south of it, close to the 107). Approximately four minutes later the AS332 contacted the Rebro frequency reporting *"just airborne off the SEDCO Seven One Four (a mobile rig believed to have been situated on the 104) we're current range of one four five miles bearing One Oh Four from the ADN level one thousand feet and request climb please two thousand feet and set to backtrack the One Oh Four radial at One Twenty Miles"*. The controller replied *"C/S roger Offshore Basic Service your company (C/S) just lifted off Safe Caledonia he should be he's on the One Hundred but he's heading for the Zero Nine Eight so that should be staying to the north of you other traffic to listen out for is a (C/S) routing Ocean Nomad to the Clyde he's passed just west of the Safe Caledonia I believe he's down at five hundred feet so obviously it's not gonna affect your climb nothing else known to affect the climb to altitude two thousand feet that's to backtrack the One Zero Four HMR"*. The pilot reported visual with the crossing traffic and climbing to 2000ft.

As soon as the pilot of the AS332 had finished his transmission, the controller asked the EC225 pilot *"what's your range now"*. The pilot responded, *"One forty (C/S of the AS332) appears to be directly below us we're at two thousand feet"*. When asked, the [EC225] pilot reported that he was not visual with the [AS332] traffic as he was *"IMC in the tops"* but had it on ACAS. The controller immediately transmitted to the AS332 *"there is traffic actually on the One Oh Four that's (EC225 C/S) he's a Two Two Five at two thousand feet already he is IMC I believe you might be just beneath him actually just maintain one for the moment please"*. The pilot replied *"Yeah thank you we're range One Four One miles on the One Oh Four what's his range (C/S) we're maintaining fourteen hundred feet"*. (Both ac were on the Fulmar RPS 1032mb.) After being advised by the controller that it had just passed through One Forty, the pilot of the AS332 reported descending to 1000ft. Subsequently, the EC225 climbed to 4000ft, allowing the AS332 to climb to 2000ft, for their respective approaches to Aberdeen.

AIRPROX REPORT No 2009-014

The local investigation revealed that the flight details for the AS332 had been changed. Originally, it was intending to operate from the Safe Caledonia and its fps had been printed accordingly showing its route as HMR 098. The routing information is displayed as bold typeface and although hand amended to HMR 104, the original route still showed through. This may have been a factor in the controller not recognising the conflict between the subject helicopters straight away, even though the pilot of the AS332 had reported on HMR 104. Additionally, it was considered that the controller allowed himself to be distracted by the presence of the transiting traffic at 500ft, especially as he had been moving its fps through the display during the incident.

Although pilots are responsible for providing their own collision avoidance, in accordance with the provision of the agreed Offshore Basic Service, the Rebro's Controller should have issued traffic information, about the EC225, to the pilot of the AS332. He temporarily overlooked the presence of the EC225 when advising the AS332 that there was no traffic to affect its climb to 2000ft. Quickly realising the situation, he checked the position of the EC225 and then instructed the AS332 to maintain 1000ft. However, by now it had climbed to 1400ft, albeit technically still below the area of responsibility of the Rebro's Sector (1500ft) before descending back to 1000ft.

ATSI Note (1): The pilot of the EC225 commented about the frequencies. Presumably he meant the nine traffic areas as appear on the map UK AIP, ENR 6-1-15-9. These are for giving information on ac positions, obtaining deck clearances and for lifting calls outside the Rebro's area. In view of the differing locations of their departure points, he was unable to hear the lifting call of the AS332.

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.

Incidents in the Aberdeen Offshore Air Safety Area can be complex to investigate due to the lack of radar to verify pilots' and controllers' reports. Also, the applicable ATC procedures are rather different to those normally used in other Class G airspace. In this instance, despite the busy and complex traffic situation, since both pilots provided accurate and complementary reports and ATSI articulated with clarity the situation regarding ATC involvement, the Board found circumstances to be clear and unambiguous.

In all Class G airspace, pilots have a responsibility to avoid other ac legitimately operating there. In the Offshore Safety Areas however, special procedures apply which allow procedural separation rather than relying totally on 'see and avoid' as the primary means of collision avoidance. That being the case, it is vital for the safe operation of ac that these procedures are rigidly adhered to so that pilots have confidence that separation exists when the weather conditions preclude visual acquisition of other ac. In this instance and despite the busy traffic situation and incomplete TI from the Rebro's Controller, as far as the information available to them allowed, both pilots had a clear mental air picture. However, one vital element was absent from the AS332 pilot's picture, namely the presence of the EC225 above him. He had not been warned of it nor had he heard any transmissions made by its pilot. Notwithstanding, this clear mental air picture had allowed the EC225 pilot to be aware that the AS332 was climbing to his level; climb his ac to avoid an immediate conflict and warn the controller who in turn corrected his TI to the AS332 pilot who then descended again in good time to further prevent a conflict.

When assessing why the Rebro's Controller had initially overlooked the presence of the EC225 when saying that there was no traffic to affect the AS332's climb to 2000ft (and into his sector), Controller Members opined that there was no single obvious factor and it was likely that a combination of events had resulted in a human error. There was no doubt that the sector was busy and, with inter-rig movements, complex; however controller Members agreed that this in itself should have been manageable. The changed intentions of the ac and the changed flight strip could also have been factors but again, when considered in isolation, manageable. However, these events had probably allowed the controller to become distracted by less important information and overlook the single most important factor, namely that there was another helicopter almost directly above the AS332 which was about to climb to the level that it occupied.

UKAB Note (2): The NATS Advisor informed the Board that their local investigation showed that at the time of the incident the AS332 was calculated to be at a range of about 145nm from the ADN and the EC225 at about 143nm. When the AS332 commenced its climb, it was estimated to be 1.75nm behind the EC225. Since this was supplementary information provided at the Board Meeting the diagram in Part A above has not been amended, being based on pilots' reports. The Board accepted the veracity of this information.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: With incomplete TI, the AS332 crew climbed their ac towards the level of the EC225.

Degree of Risk: C.

AIRPROX REPORT No 2009-015

AIRPROX REPORT NO 2009-015

Date/Time: 21 Mar 1333 (Saturday)

Position: 5109N 00106W (3-5nm SW Lasham - elev 618ft)

Airspace: FIR (Class: G)
Reporting Ac Reported Ac

Type: PA18 + Glider LJ45

Operator: Civ Club Civ Pte

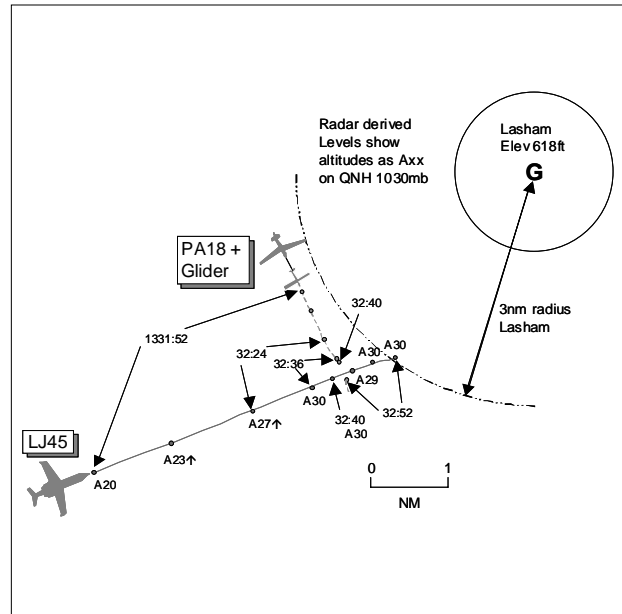
Alt/FL: 2700ft↑
(QFE) (QNH)
↑3400ft

Weather VMC HAZE VMC CAVK

Visibility: 4000m >10km

Reported Separation:
100ft V/25m H NR

Recorded Separation:
<0.2nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE PA18 + GLIDER COMBINATION PILOT reports flying a local aerotow sortie from Lasham and in communication with Lasham on 131-025MHz; no transponder was fitted. The visibility was generally 8km but reducing to 4000m into Sun in VMC and the ac was coloured black/yellow with nav, anti-collision and strobe lights all switched on. He was flying with an experienced tug pilot and undertaking a tug-pilot competency check and biennial training flight. About 3nm SW of Lasham heading 180° climbing through 2700ft Lasham QFE at 70kt with a small amount of R bank, he noticed what he thought was a Citation X jet 500m away heading E and converging. He realised that if the other ac maintained its level and direction then they would miss: however, he felt compelled to take control from the handling pilot to increase separation by pulling back and rolling to the R. His hands had not been close to the controls so this had delayed his response a little. The handling pilot seated in the front had been looking L and did not see the other ac until he took avoiding action. The ac had approached from the sector which was into Sun and where the visibility was poor. The other ac was coloured white or silver with a coloured fin, passing 100ft below and 25m ahead with a high risk of collision. He telephoned Farnborough after landing and established that the other ac was a LJ45 which has a similar wing/fuselage bulge to the Citation X which would account for his misidentification. Lasham was very active with several ac within 3nm of the aerodrome and it is normal for Farnborough to advise flights to bear this in mind when planning how close to fly to Lasham. He opined that with their black paint scheme and being down-Sun to the other ac's crew they would possibly have been easier to see.

THE LJ45 PILOT did not wish to submit a report for what he considered was a routine encounter in the FIR. In a brief e-mail the Capt stated that the Wx was perfect CAVOK. They were enroute to Biggin Hill and he had received a service from Solent and Farnborough whilst maintaining a good lookout. The ac was RVSM compliant; fitted with enhanced Mode S and, with MNPS approval, visible to all TCAS equipped ac. Climbing to 3400ft QNH he had seen the Tug and glider combination but this did not cause him concern and he did not need to take avoiding action. Hence, they only descended 100ft to 2900ft which in his view was not taking avoiding action. No TCAS TA or RA warnings had been generated, suspecting that the tug ac did not carry a transponder.

THE FARNBOROUGH APPROACH CONTROLLER reports he was informed by Solent that a LJ45 business jet from Bournemouth to Biggin Hill was transiting the LARS W Sector. He had departing traffic to work on a S'bound track and the LARS W controller was busy so he opted to work this traffic. This was based on the fact that he knew it would be fast, require a radar service and given the LARS workload it would be better that he worked it as he had the capacity. The ac was pre-noted by Solent as VFR and at 4000ft on a 3675 squawk. He saw a faint contact of this ac to the S of Chilbolton a few minutes later at 2000ft, suspecting that it would be climbed to 4000ft into CAS and out S of Lasham. He had warned Solent, owing to its speed, to keep it clear of Lasham as it was

moderately busy with glider contacts: this had been acknowledged. He did not have a positive ident on the traffic but was able to start basic planning. At about 1329 he noted a 3675 slightly W of Winchester at 2000ft which he found unusual as he was expecting it higher. He subsequently rang Solent to investigate what had happened and whether this was the ac he was getting. As he selected the telephone button the LJ45 pilot called at the same time Solent answered and he asked whether this was the ac he was expecting, which was confirmed. He asked the flight to change squawk and what service was required as this had not been stated previously. Once identified he provided the flight with a Traffic Service (TS), in line with the new ATSOCAS, warning the flight that it would be best to remain on the current E'ly track for the next 5nm owing to its proximity to Lasham which was busy with gliding. The crew acknowledged the call: by now the ac was 1.5nm E of Winchester tracking E. Owing to the departing traffic he asked the flight to climb to 3400ft having previously cleared the departing ac to climb to 2400ft as he had expected the LJ45 at 4000ft. The LJ45 passed about 2nm S of Lasham at approximately 180-210kt and when about 4nm SE of Lasham it turned towards OCK. He again issued a warning, having previously passed TI on 3 contacts that had affected the flight. The LJ45 descended to the S of Farnborough once clear of the departure and continued en-route. Some time later a pilot rang in, possibly a glider pilot, to report an Airprox possibly with the LJ45. He had noticed that no contact came within 1nm of the LJ45, he thought, and the pilot reported good VFR conditions. He believed that he had done all that he could for the VFR LJ45 flight, warning him 3 times about Lasham and calling all contacts on radar in a timely manner.

ATSI reports that the incident took place approximately 3-5nm SW of Lasham aerodrome in Class G Airspace. The LJ45 was on a VFR flight from Bournemouth to Biggin Hill and, following transfer from Solent Radar, established communications with Farnborough Approach at 1330:30. The pilot reported at 2000ft, squawking 3675 (a Solent discrete code). The Radar controller issued a discrete Farnborough code and asked the pilot what service was required. A Traffic Service (TS) was agreed and the flight provided with the Farnborough QNH 1030mb. It was identified 10nm N of the SAM VOR.

Guidance on the provision of a TS appears in MATS Part 1, Section1, Chapter 11, Page 5, Paragraph 4 and includes:

“A Traffic Service is a surveillance based ATS, where in addition to the provisions of a Basic Service (see Para 3), the controller provides specific surveillance derived traffic information to assist the pilot in avoiding other traffic. Controllers may provide headings and/or levels for the purposes of positioning and/or sequencing; however, the controller is not required to achieve deconfliction minima, and the avoidance of other traffic is ultimately the pilot's responsibility.”

“The controller shall pass traffic information on relevant traffic, and shall update the traffic information if it continues to constitute a definite hazard, or if requested by the pilot. However, high controller workload and RTF loading may reduce the ability of the controller to pass traffic information, and the timeliness of such information.”

The controller obtained confirmation that the flight was on its own navigation and then at 1331:30, made a request of the pilot *“(LJR45 c/s) if you want to keep running on that sort of track for the next six miles just to avoid Lasham it's very active and I'll put you on track also in the next four miles could I ask you to have a co-ordination to climb to three thousand four hundred feet to facilitate a departure from Farnborough.”* The pilot replying *“Affirm that's no problem at all we'll climb er three thousand four hundred feet to remain on track thanks (LJ45 c/s).”* The controller's aim was to try and ensure the LJ45 passed to the S of Lasham by a reasonable margin (the Farnborough MATS Part 2 advises to avoid vectoring within 3nm of Lasham (Ref APR4.2)). Although the ac did remain on this preferred track for a short while, the radar recording shows that by 1331:49 it had turned L onto a track that would take it closer to Lasham than would otherwise be the case.

At 1331:53, the flight was issued TI *“(LJ45 c/s) unknown traffic left eleven o'clock two miles right to left no height glider”* and the pilot reported 'looking'. Thirty seconds later, at 1332:24, he issued further TI, on a different target, *“(LJ45 c/s) unknown traffic one mile left to right no height”*, the pilot responding *“Er we got him thanks.....”*. This target, it is believed, was the subject PA18 Super Cub with glider under tow. The radar recording shows the traffic as a primary-only target in the LJ45's 11 o'clock position at a range of 1.3nm, tracking SSE, the LJ45 indicating at altitude 2700ft London QNH 1030mb, in the climb, GS 245kt. Tracks continue to converge and at 1332:40, they are 0.2nm apart, the LJ45 now at altitude 3000ft Mode C, with the unknown in its 10:30 position. CPA is not recorded as the PA18 and glider combination fades from radar. The next radar sweep reveals the LJ45 indicating altitude 2900ft having crossed through the PA18 and glider's projected track before showing 3000ft on the next sweep 4sec later. The PA18 pilot reported the Airprox occurring as he climbed through 2700ft Lasham QFE which

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equates to 3318ft QNH. The PA18 combination reappears at 1332:52 in the LJ45's 6 o'clock position at a range of 0.7nm. No further comment was received from the pilot of the LJ45.

There are no apparent implications for ATC in this incident. The Farnborough Radar controller provided pertinent TI, both generic and specific, to the LJ45 in line with the guidance for the provision of a TS.

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.

As this incident occurred in Class G both crews were responsible for maintaining their own separation from other traffic through 'see and avoid'. The PA18 combination had right of way under the Rules of the Air, the rear seat pilot seeing the approaching LJ45 500m away as it came into view from his R, an area where the visibility was degraded owing to haze and the Sun's relative position. An experienced GA Member opined that the view from the rear seat of a PA18 is known to be poor, owing to the ac's configuration, and the LJ45 was not an ideal platform to fly VFR, particularly when operating at speeds of 250kt or less in the cruise. Even though the PA18 pilot judged the ac were not going to collide, the pilot instinctively reacted to the LJ45's sudden appearance by pulling back on the controls and turning R, estimating the LJ45 passed just ahead and slightly below. Meanwhile, the climbing LJ45 flight had been given accurate and timely TI by the Farnborough controller and the crew had visually acquired the PA18 combination immediately, adjusting their flightpath to maintain visual contact and separation from it. The LJ45 pilot had chosen, and was happy with, the miss distance but he had flown close enough to the PA18 combination to cause its pilot concern which Members agreed had caused the Airprox. The combination of accurate and timely TI from the Farnborough controller and the visual sightings and subsequent action taken by both crews allowed the Board to conclude that any risk of collision had been quickly and effectively removed.

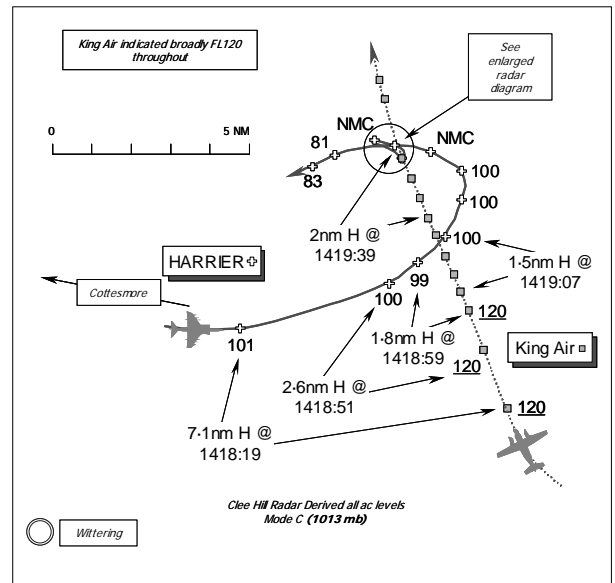
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The LJ45 crew flew close enough to the PA18 combination to cause its pilot concern.

Degree of Risk: C.

AIRPROX REPORT NO 2009-016

Date/Time: 20 March 1420
Position: 5246N 00013W (14nm NE of Wittering)
Airspace: London FIR (Class: G)
Reporting Ac Reported Ac
Type: BE200 King Air Harrier GR7
Operator: HQ Air (Trg) HQ Air (Ops)
Alt/FL: FL120 FL70-195
Weather VMC Haze VMC Sky Clear
Visibility: NR Unlimited
Reported Separation:
 Nil V/<100m H Not seen
Recorded Separation:
 500ft V/0-3nm H
 [Claxby Data @
 1420:06]



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BEECH BE200 KING AIR PILOT reports he was enroute from Cranwell to Coningsby at FL120 for a pre booked PAR, operating VFR under a TRAFFIC Service from London MILITARY [LATCC (Mil) CON15] on 233.72MHz. The assigned squawk was selected with Mode C on; Mode S and TCAS are fitted.

Approaching a position about 14nm NE of Wittering heading 340° at an IAS of 220kt with the A/P engaged, his co-pilot informed London MIL of their intentions to go en-route and contact [free-call] Coningsby APPROACH. However, the controller told them to stay on the frequency as a Harrier from Cottesmore was climbing in their vicinity under the control of London MIL. He became visual with a grey Harrier jet in his 10 o'clock – low – some 3km away, climbing at a high RoC, which climbed past them with a horizontal separation of about 1.6km slightly L of their nose. The Harrier pilot then proceeded to do a 'Half Cuban' manoeuvre topping out between FL128-130 before entering a near vertical descent. It was as the Harrier began its half Cuban manoeuvre that both he and his co-pilot became concerned and as soon as the Harrier started in descent he was aware that a collision was highly likely. Disengaging the AP, he performed a steep turn to the R to avoid the Harrier which crossed obliquely from R-L some 100m away as it descended through their level with a "very high" risk of a collision.

At no point during the incident did TCAS display the Harrier or issue any avoiding action although the jet passed within 100m of their ac. An RT call was not made about the Airprox at the time of the incident, their priority being to land their ac safely after the occurrence. An Airprox was subsequently reported to the RAC at LATCC (Mil) at the earliest opportunity.

THE HARRIER GR7 PILOT reports over 1 month after the Airprox occurred upon returning from leave that on this day he flew a general handling sortie, which included aerobatics, in a clear sky with unlimited visibility. During the sortie, operating in a block from FL70-195 under a TRAFFIC Service from London MILITARY, he had been informed of traffic inbound to Cranwell at FL80, he thought, some 5nm to his SE so he had therefore turned NW before starting his aerobatics. Unaware that an Airprox had happened until after he had landed, he was advised that the incident had occurred some 15nm SE of Cottesmore, but no other ac were seen during that portion of his flight. The ac is grey in colour but the white HISLs were on.

THE LATCC (MILITARY) CONSOLE 15 CONTROLLER (CON15) reports that he was operating without an ALLOCATOR and monitoring the Initial Contact Frequency (ICF). Two ac were on frequency and another two were prenoted - a Harrier from Cottesmore [the subject Harrier GR7] and GAT outbound from Norwich to join at NALAX. The first of the two ac already under an ATS [here referred to as 'ac 3'] was N of the Humber inbound to Cranwell with the second – the subject BE200 King Air - N of Marham inbound to Coningsby for a PD under a TRAFFIC Service. The ac to the N started general handling in the Humberside area and the BE200 King Air to the South

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continued to track westbound towards Cottesmore. At a position about 15nm E of Cottesmore, the BE200 King Air turned R onto a Northerly heading at FL120 and the crew requested to change frequency to Coningsby. As the subject Harrier was climbing out from Cottesmore, he instructed the BE200 crew to remain on his frequency and called the Harrier to them – to which the BE200 crew reported visual. At the same time there was a weak free-call on the ICF and the Cottesmore direct landline rang for a hand-over. Accepting the hand-over of the Harrier GR7 from Cottesmore he instructed the other free-calling pilot – ac 4 - to standby. The Harrier GR7 pilot called on 397.175 – a discrete frequency - checked in and the ac was identified; traffic information was then passed to the Harrier pilot about the BE200 King Air. At this point, he tried to determine the location of the free-calling ac 4 which was 30nm NW of DCS - well outside of his operating area – so the pilot was instructed to free-call Scottish Military. It was at this point that he believes the Airprox occurred, although it was not reported on the frequency at the time. The BE200 King Air was subsequently handed over to Coningsby.

THE LATCC (MIL) SUPERVISOR (SUP) reports that traffic on the unit was diminishing this Friday afternoon with most military flying complete for the day. At the time of the Airprox a maximum of 2 General Purpose (GP) Consoles were open, but CON15 was also performing the role of ALLOCATOR so might have been answering additional landline calls.

SUP did not witness the Airprox as he was involved with determining future traffic levels and was periodically checking the radar, whilst also carrying out other supervisory tasks with several liaison calls to make.

CON15 was aware that other consoles were available if traffic levels dictated and, as an experienced controller, when consoles were required. In total, for the period 1400-1430, two consoles were available with a third becoming available (D&D just changing to MATO manning) and from 1430-1540, 4 additional consoles would have been accessible due to the MATO shift arriving. The shift changes were due to arrive shortly and traffic levels were expected to decline by 1500-1530.

MIL ACC reports that the BE200 flown by the reporting pilot was on a NAVEX with a planned PD at Coningsby under a TRAFFIC Service from CON15 who was also monitoring LATCC (Mil) (East) ICF and a VHF frequency for a pre-noted departure from Norwich. Another military flight – ac 3 - was pre-noted by Humberside to operate in the Vale of York at 1356:16. The controller involved and SUP were not aware of the Airprox until 1630 when the Captain of the BE200 reported the Airprox by telephone.

At 1354:37, the BE200 crew made contact with CON15 on handover. At 1354:40, the controller responded “[BE200 C/S], *London Mil identified FL130 TRAFFIC Service*”, which was acknowledged moments later with [BE200 C/S]. After the controller passed traffic information to the BE200 crew on unrelated traffic, at 1403:49 the crew advised that they were “*..now turning, heading 3-1-0 descending FL125*” which was immediately acknowledged.

Ac 3 was handed over at 1405:08 announcing at 1405:54 “[ac 3 C/S]..*we’ll be conducting some training on the way back and..we might be doing a practice diversion. I’ll tell you in 5 to 10 minutes*”, which CON15 acknowledged. At 1407:40 the controller transmitted traffic information to the crew of ac 3, to which the pilot responded “*...we’re visual with him, and we’ve just come up with a cunning plan. Our intention will be to carry out a, when South of the Humber, will be carrying out general handling for approximately 5 minutes, before a, er, hopefully doing a radar recovery into Waddington. Will you see if Waddington will accept us for a practice diversion on the way back please?*”, which CON15 acknowledged at 1408:06 “*..copied and wilco*”. Between 1408:19 and 1409.15, CON15 was on the landline to Waddington agreeing the PD and pre-noting ac 3. At 1409:31, the controller advised the crew of ac 3 that Waddington were happy to accept them for a PD and to report ready to manoeuvre. Between 1409:44 and 1410:30 the controller was on the landline to Humberside taking a pre-note which he accepted and allocated to another console.

At 1411:08, CON15 advised the BE200 crew of traffic information on unrelated traffic at 12 o'clock - 10 miles manoeuvring. After CON15 ascertained the type of approach the BE200 crew required at Coningsby, the crew of ac 3 announced they would like freedom to manoeuvre between FL70 and FL100 for the next 5 minutes, which the controller agreed asking them to report 1 minute to completion. Between 1412:35 and 1412:54, the controller pre-noted the BE200 to Coningsby, followed by traffic information to ac 3.

For just under 1min, between 1416:17 and 1417:15, CON15 was on the landline to Humberside trying to agree co-ordination. During this time another military flight – ac 4 - free-called on the ICF at 1416:28 and was told to

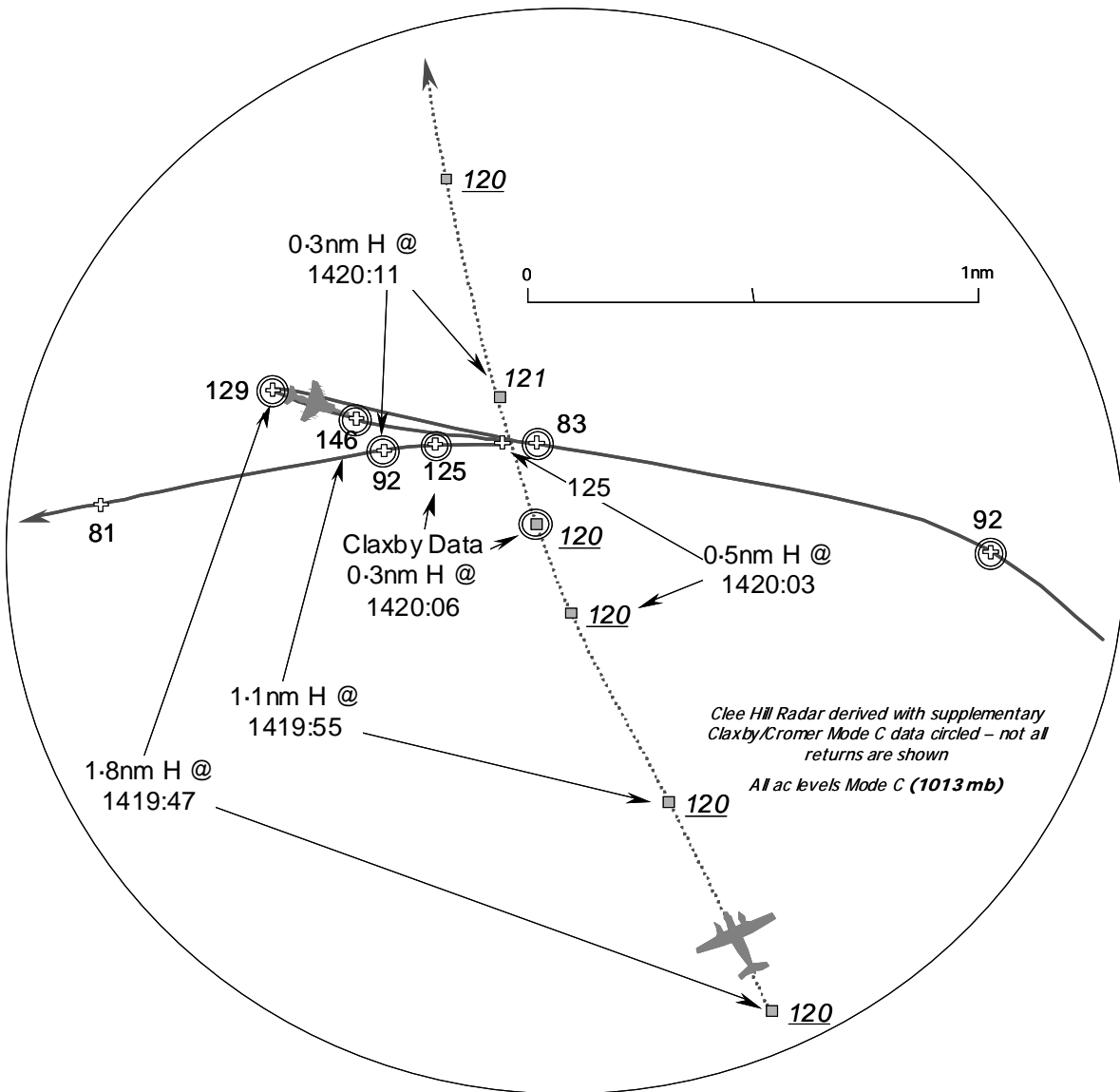
“standby”. At 1417:17, CON15 answered the landline from Cottesmore and accepted the handover of the subject Harrier that was complete at 1417:40 whereupon the Norwich departure transmitted on VHF *“London Mil good afternoon [ac 5 C/S] passing FL73, climbing FL170, direct NALAX request DECONFLICTION Service”*. The controller responded at 1417:48, that ac 5 was identified, climbed the flight to FL170 and placed it under a DECONFLICTION Service, which was acknowledged by the pilot. At 1417:58 the controller transmitted *“Station calling London Mil I-C-F..pass your details”* which was answered at 1418:03, by the pilot of ac 4 *“...currently above Deans Cross heading 300° at FL85”*. Before the controller could respond to ac 4, at 1418:11 the BE200 crew transmitted *“London Mil [BE200 C/S] heading 340° and happy to continue en-route contacting Coningsby for a pre booked PD. Thanks very much”*. However, at 1418:20 the controller transmitted *“..roger standby traffic [the subject Harrier not yet on frequency] left 10 o'clock 10 miles crossing left-right under my control, Harrier climbing through flight level 1 hundred for 1-9-5”*. The BE200 crew responded at 1418:30, *“looking..for traffic..[BE200 C/S]”*. At 1418:38 the pilot of ac 3 announced *“..1 minute till end of manoeuvre”* which was acknowledged by CON15.

At 1418:45, the Harrier pilot contacted CON15 *“London [Harrier C/S] to work East of Cottesmore block 5-0 to 1-9-0 TRAFFIC Service please”*. The controller answered at 1418:51, *“[Harrier C/S] London Mil good afternoon identified manoeuvre as required 5-0 to 1-9-0 TRAFFIC Service, traffic South East 5 miles, Beech 200 at FL120”*. To which the Harrier pilot responded at 1419:04 *“..TRAFFIC Service thanks”*. At 1419:10, the controller transmitted *“Station calling London Mil on 277.7 say again your position”* to which the pilot of ac 4 responded at 1419:16 *“[ac 4 C/S] Dean Cross radial 3-0-0, 5 miles, descending to FL67 now request radar service for descent 10 miles South of Dumfries”*. The controller responded at 1419:29, *“Roger, you are on London Military frequency, are you trying to get hold of Scottish Mil?”* to which the pilot responded at 1419:35, switching to Scottish Military. At 1419:50, the controller instructed the BE200 crew to squawk A1735 which the pilot acknowledged at 1419:54 *“Squawk 1735 and is visual with the Harrier”*. After the controller instructed the crew of ac 5 to climb to FL260, between 1420:28 and 1420:41 the controller ascertained the intentions of ac 3 and instructed the pilot to squawk A3612. Following a request to the BE200 crew to recycle their squawk, CON15 instructed them to descend to FL80, which was acknowledged by the pilot at 1420:59. At 1421:05, CON15 passed traffic information on additional unrelated pop-up traffic *“..left 10 o'clock..3 miles manoeuvring indicating FL65”*, adding *“Further [unrelated] traffic right 1 o'clock 8 miles crossing left-right FL65”*. The BE200 crew responded at 1421:27, *“Looking for traffic [BE200 C/S]”*. Between 1421:52 and 1422:23, CON15 completed the handover of ac 3 to Waddington and the BE200 to Coningsby, whereupon at 1422:34, CON15 instructed the BE200 crew to contact Coningsby on 282.72MHz, which the pilot acknowledged and added *“..thanks very much for your help”*. The subject Harrier continued to manoeuvre uneventfully until the ac was handed back to Cottesmore at 1428:14.

Both the BE200 and the GR7 were identified by CON15 and receiving a TRAFFIC Service. Both ac were squawking their allocated codes correctly and operating in VMC. CON15 was aware of a potential conflict between the BE200 and Harrier GR7 – that was not yet on frequency - and requested that the BE200 crew remain on his frequency until the Harrier pilot had called and at this point, with 10nm between the ac, passed timely traffic information. Once the Harrier pilot was on frequency traffic information was also passed about the BE200 (at a range of 5nm) but did not include the direction of transit of the BE200. The Harrier pilot acknowledged the traffic information and in his report stated that he had turned away to the NW before commencing his aerobatics. During the aerobatic manoeuvre the Harrier appears to turn back onto a SE track towards the BE200. The BE200 pilot did not report the Airprox on RT after the incident. At no point did the Harrier pilot see the BE200.

The controller's workload at the time of the incident was higher than recommended (4 tracks on 3 frequencies and one free-calling on a fourth frequency). The Unit Order Book (UOB) states that when CON15 is operating as an ALLOCATOR, further consoles are to be opened when the controller has 2 ac under control. Usually, another console would already have been opened and/or traffic offloaded at an earlier stage than in this instance (other controllers were available) but the controller believed that the BE200 and the other flight would be off frequency before the pre-noted Harrier called. The higher than normal workload could have been a factor in the controller not updating the traffic information for both the Harrier and the BE200 but further traffic information in the time available would not have prevented the Airprox. As a result of this incident both CON15 and the SUPERVISOR have been re-briefed on the requirement to adhere to the UOB with regard to opening further consoles at an early stage to allow for unexpected increases in workload.

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UKAB Note (1): The recording of the Clee Hill Radar shows the BE200 at 1419:07, after the R turn tracking NNW'ly level at FL120, after the Harrier GR7 had originally crossed from L-R 1.5nm ahead some 2000ft below the twin turbo-prop at FL100. The Harrier then turned L about and the jet's Mode C is lost in the turn through N as it apparently commences an aerobatic manoeuvre. Because of the absence of consistent displayed Mode C data on the Clee Hill recording thereafter, the data from several other sources was reviewed, including the Claxby, Cromer, Great Dun Fell, Stansted 10cm and Heathrow heads in an attempt to discover the jet's profile. The recorded video gave only intermittent data so the radar head plot list data of the Claxby and Cromer Radars was helpfully provided by NATS Ltd through the RAC. Whilst it was not clear which specific radar selection was in use by CON15 at the time, it was evident that whilst the Harrier was manoeuvring, a significant amount of Mode C data had apparently been suppressed by the individual radar data processing system and not displayed on the recording because it was perceived to be "invalid". At face value, the plot data appeared broadly consistent when compared across the two radar sources, given that the individual radar scans would have occurred at different times. The Board was briefed that following the investigation of Airprox 17/06 and the subsequent response to the associated Safety Recommendation, it had been revealed that there was indeed a technical limiting factor to the display of Mode C data derived from ac conducting vigorous manoeuvres. In general terms, it was explained that Mode C plots are declared "invalid" at the 'head' if successive scans vary by more than 1000ft from scan to scan and consequently are not displayed – the controller seeing a line of three dashes in place of the numeric

Mode C value. Clearly, different Radar heads rotate at different rates dependant on their design parameters: e.g. the Claxby – a typical en-route area radar source – has a scan rate of broadly 8sec therefore this source would theoretically declare “invalid” any Mode C from an ac climbing or descending at a RoC/RoD of over 7500ft/min. Whereas a radar source that updates broadly every 5 secs - such as the Cromer - could potentially track ac at a RoC/RoD of over 12000ft/min. Furthermore, Mode S equipments can track at potentially higher rates. It has been reported that NATS’s radar systems [the source of radar data provided to LATCC (Mil) and ASACs] are broadly configured for the detection of the expected extremes of civilian ac, not military jets. With the foregoing in mind, further analysis of the radar head plot listing, helpfully provided by NATS Ltd, was conducted and the Claxby and Cromer data compared with that provided by the Clee Hill. Consultation with NATS’s technical staff suggested that even data declared “invalid” should correspond within 1-200ft and thus broadly within the same tolerance as that for considering Mode C data to be ‘verified’. The enlarged radar diagram was thus drafted as a composite picture of the radar heads’ data illustrating that the Harrier had climbed up to a maximum of FL146, it would seem, before descending once more down to FL125 at the point of minimum horizontal range. The reported avoiding action R turn accomplished by the BE200 pilot is replicated but not obviously apparent as such on the radar recording at this displayed range as the ac close to 0.5nm, the GR7 indicating 500ft above the BE200 at 1420:03, at the moment of the Airprox. However, one scan is then lost which was at the point that the Harrier reversed course westerly, apparently after completing the aerobatic manoeuvre. The BE200 is shown 0.3nm SE of the Harrier, with one “valid” sweep of the Claxby recording the GR7 at FL125 Mode C, some 500ft above the BE200, before descending through the latter’s level. The GR7 rolls-out heading WSW’ly with NMC on the Clee Hill - but FL92 recorded by the Cromer - as the BE200 climbs momentarily to FL121. The BE200 maintains its northerly mean line of advance and the Harrier clears to the W; the Clee Hill showing the GR7’s Mode C at FL81 and then FL83.

HQ AIR (TRG) comments that TI had been passed to both ac and the BE200 crew visually identified the GR7. The TI given to the GR7 pilot placed the BE200 5nm SE at FL120 so he turned onto a NW’ly heading to avoid. He did not have visual contact with the BE200, which he thought was now well clear, and as he practiced his aerobatics flew close to the BE200.

HQ AIR (OPS) comments that it would seem that the Harrier was given TI on the King Air. However, it is not obvious from his reply that he noted it as a factor. Perhaps some indication of the heading of the King Air would have prompted him to realize it was heading his way. That said, the perception by the King Air that the Harrier was descending onto him may have been erroneous as it seems this was the second half of his ‘Cuban 8’ resulting in him swiftly diverging. It is, however, important when carrying out these type of manoeuvres in Class G Airspace that the area into which you are going is cleared as well as possible before each one commences.

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 video and plot data, reports from the air traffic controller involved and reports from the appropriate ATC and operating authorities.

The HQ Air Command Mil ACC report had confirmed that the pilots of both military ac involved here were not only working the same military ATCRU but also in receipt of a TRAFFIC Service from the same controller at LATCC (Mil). It therefore seemed plain from the outset that both pilots were content to be merely told about other traffic in their vicinity rather than requiring ATC to separate or deconflict their flights. However, in addition to executing a normal general purpose ‘Middle Air’ task, CON15 was also acting as the ALLOCATOR and manning the initial contact frequencies. A military area controller Member suggested that this additional workload and specifically the distraction of the free-call in the vicinity of DEAN CROSS had not affected the provision of a comprehensive TRAFFIC Service to either flight. Nevertheless, the Board noted the Command’s comment which revealed that with 4 tracks on 3 frequencies and one free-calling on a fourth frequency the controller’s workload was higher than that recommended and that further consoles should have been opened when 2 ac were under control, especially when additional control capacity was readily available. Whilst Members understood the contention that the controller believed his workload would soon be reducing, in the Command’s view the higher than normal workload could have been a factor in the controller not updating the traffic information for both the Harrier and the BE200. Moreover, it was clear that if CON15 had not been required to cope with free-calls on multiple frequencies, his attention would not have been diverted and the controller might well have been able to concentrate more on the provision of the TRAFFIC Service to these two military ac. Nevertheless, CON15 had astutely requested the BE200 crew remain on his frequency until the Harrier pilot had confirmed his intentions thereby showing sound appreciation of the potential for a conflict to develop between the two ac. Conversely, controller Members were

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critical of the content of the traffic information provided to the Harrier pilot “..traffic South East 5 miles, Beech 200 at FL120”, which was viewed as being incomplete. A military controller Member pointed out that the absence of any reported direction of flight for the BE200 plainly denied the Harrier pilot a complete picture of what was happening when the relative position was transmitted, which probably did not highlight the relative geometry sufficiently and the threat posed to the GR7. Accepting that CON15 would probably have been using a large displayed radar range – 110/150nm is not uncommon - when the traffic information was transmitted the BE200 was actually only 2.6nm away.

Whilst the Harrier pilot could have requested an update, in a reportedly clear sky with the BE200 a mere 2000ft above the jet, pilot Members were most surprised that the Harrier pilot had not spotted the twin Turbo-prop at all. A fast-jet pilot Advisor agreed that the Harrier pilot had been given no clues that the BE200 was actually flying towards his intended manoeuvring area. Consequently, when the GR7 pilot responded that he was turning NW he might well have been searching the airspace where he intended to complete his aerobatics, potentially belly-up to the BE200 to starboard whilst in his initial L turn and possibly looking away from where the actual threat lay. Having commenced his aerobatic manoeuvre the radar recording had revealed that the Harrier pilot had crossed back and forth across the nose of the BE200 – on the second occasion from R – L whilst descending to about FL83. Thereafter, archived SSR plot data showed that the GR7 was at FL129 at the western extremity of the manoeuvre, topping out at about FL146 before descending down to FL 125 - albeit with one sweep of the radar lost - apparently passing just across the nose of the BE200 from L – R before reversing and clearing to the W of the BE200 from R – L, broadly in conformity with the BE200 pilot's description of the event at close quarters. Whilst the minimum range reported by the BE200 pilot during the encounter of 100m at the same level was not captured by the radar recordings, this was not surprising considering the speed of the jet and the range discrimination associated with long-range en-route radar equipments. This, coupled with the 8sec data update rate, meant that the cross would have occurred in between individual radar scans. Therefore, weighing all these factors carefully, there was no reason for the Board to doubt the veracity of the reported minimum separation by the BE200 pilot who was the only eyewitness to the event.

Having seen the jet cross initially from L – R 1.5nm away and then turn about, pilot Members pointed out it would have been difficult for the BE200 pilot to decide which way to manoeuvre his twin out of the way of the descending jet. Moreover, the intentions of the GR7 pilot would not have been evident at all. The available data suggested a momentary RoC for the GR7 in the order of 20250ft/min between scans and a RoD of about 15750ft/min down to FL125. Accepting that TCAS and STCA will generally capture another ac's Mode C up to a maximum rate of 10,000ft/min, it was not surprising to the Members that the Harrier's level was not displayed on the BE200 King Air's TCAS nor that an RA was not triggered as the system cannot keep track of jets at the rates suggested here, such vertical speeds being outwith TCAS's nominal operating parameters. However, it was plain from the GR7 pilot's account that he had not spotted the BE200 at all and Members agreed unanimously that the cause of this Airprox was that whilst conducting high-energy manoeuvres, the Harrier GR7 pilot flew into conflict with the BE200 King Air which he did not see.

Whereas the BE200 pilot had reported visual contact to CON15, the controller had not proffered further advice to the pilot of the single-seat jet which might well have induced him to look again for the BE200 or moderate his high-energy manoeuvres somewhat. Although the presence of the Harrier was cloaked from the BE200's TCAS by the high RoC/RoD, the traffic information provided by CON15 had, at a minimum, facilitated the visual acquisition of the jet by the BE200 pilot and fortunately allowed him to track it visually. So although at these close quarters only one pilot was sighted to the hazard, in the Board's view this, coupled with the BE200 pilot's avoiding action, had narrowly removed any actual risk of a collision. However at these close quarters, with the Harrier pilot executing high-energy manoeuvres at high speed, unaware of the close proximity of the BE200, Members agreed unanimously that the safety of the ac involved here had certainly been compromised.

Turning once again to the issue of displayed Mode C data, notwithstanding the design parameters of the radar display system as a whole, with no obvious clue from the Harrier's Mode C available to CON15, it seemed to the Members that the lack of such data might well have prevented the controller from intervening further, effectively rendering him blind to the conflict because of the radar data processing system's 'filtering'. Whilst it was debateable whether the controller would have taken further action under the TRAFFIC Service or whether it would have had an impact on the outcome here to forestall this close quarters situation, the Board was concerned that the fullest Mode C information did not seem to be available to the LATCC (Mil) controller. Whilst it was entirely understandable that NATS en-route radars might be optimised to the flight parameters expected of civilian ac, military controllers at military ATCRUs were tasked with providing a service to military fast-jets that would plainly

operate in a more robust manner. Thus the Board was concerned that the displayed radar data should be optimally attuned for the provision of radar services to such ac that routinely conduct high energy manoeuvres. The outcome of this lengthy debate on this topic was that the Board charged the Chairman with writing to the MOD, CAA and additionally to NATS Ltd as the provider of the radar systems to LATCC (Mil), to highlight this issue and appraise them of the circumstances revealed by the Board's assessment of this Airprox.

PART C: ASSESSMENT OF CAUSE AND RISK

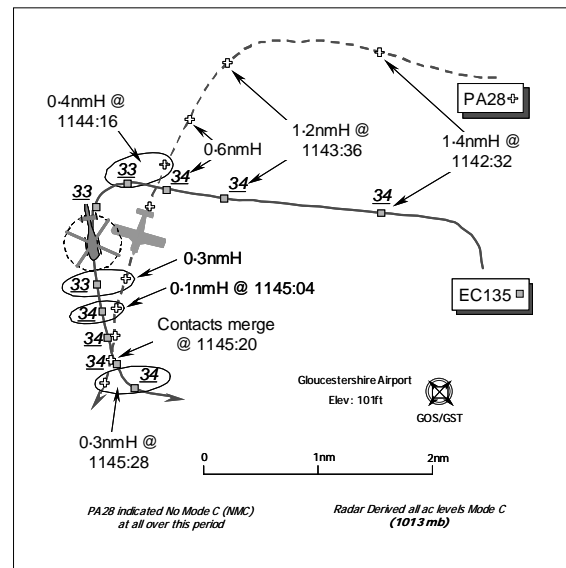
Cause: Whilst conducting high-energy manoeuvres, the Harrier GR7 pilot flew into conflict with the BE200 King Air, which he did not see.

Degree of Risk: B.

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Date/Time: 26 March 1145
Position: 5154N 00215W (3nm W of Gloucestershire Airport - elev: 101ft)
Airspace: London FIR (Class: G)
Reporting Ac Reported Ac
Type: EC135 PA28
Operator: Civ Comm Civ Trg
Alt/FL: 3000ft 2200ft
QNH (999mb) RPS (995mb)
Weather IMC In Cloud VMC CLBC
Visibility: 10km+ 30km
Reported Separation:
2-300ft V/0.1nm H 5-600ft V/1/2nm H
Recorded Separation:
SSR contacts merge
[Min V 260-660ft based on indicated Mode C/pilot's RT report]



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE EC135 T2 HELICOPTER PILOT reports he was instructing a Student flying in the GST [Gloucestershire locator] hold level at 3000ft Gloucestershire QNH (999mb) in IMC under IFR, whilst in receipt of a PROCEDURAL ATS from GLOSTER APPROACH (APP) on 128.550MHz. A squawk of A7000 was selected with Mode C & S on; TCAS is not fitted.

At the end of the outbound leg, in a position 300°GST, 2.5d GOS, flying level at 3000ft Gloucestershire QNH (999mb) turning L at 100kt, they flew clear of cloud into VMC briefly for about 1min, during which they observed a PA28 on their starboard side about 1/2nm away and below his helicopter. The inbound L turn in the hold was stopped to avoid the PA28, which allowed the light ac to pass about 0.1nm away to port and some 200-300ft beneath them at the closest point with a "high" Risk of a collision. When first seen the aeroplane appeared to be in a slight climb but then it seemed that the aeroplane levelled and started a slight descent away from them.

The PA28 pilot had been advised of their position by APP, had elected to descend to an altitude of 2500ft and to remain clear of the Gloucestershire Airport ATZ. He opined that the PA28 pilot might have been flying with the Cotswold QNH of 995mb set.

His helicopter is coloured red with yellow markings; the HISLs were selected to 'Red' at the time of the Airprox with the nav lights on.

[UKAB Note (1): In a subsequent telephone conversation with UKAB Staff, the EC135 pilot clarified that a student pilot in the rear seat obtained a fleeting glimpse of the PA28 to starboard, he thought about 2nm away, when they were flying on a parallel course. The Pilot-in-Command then acquired the PA28, 1/2nm away to starboard, briefly through a gap in cloud, as they crossed ahead of the light ac. Having stopped the inbound turn and steadied southbound, they kept the PA28 in sight to port until they re-entered cloud.]

THE PA28 PILOT reports they were flying VFR from Wellesbourne Mountford to Filton, via Gloucestershire Airport in VMC. A squawk of A7000 was selected with Mode C but Mode S is not fitted. The HISLs were on.

They called GLOSTER APPROACH (APP) on 128.55MHz at Evesham for a BASIC ATS and to route through the Gloucestershire Airport overhead. The controller gave them the Cotswold RPS (995mb) but said they could not route via the overhead due to traffic in their hold. Consequently, they routed around passing N abeam and W abeam. Descending to 2200ft RPS 995mb because of cloud, flying some 400ft below the overcast when they were W abeam Gloucestershire Airport, heading 200° at 100kt, they saw the red helicopter about 1/2nm away, just to

their right, flying in and out of cloud. They were visual with the helicopter as it passed 500-600ft above them with horizontal separation of ½nm. No avoiding action was taken as it was “not needed” and he assessed the Risk as “low”.

ATSI reports that the incident took place in Class G Airspace, 3nm NW of Gloucestershire Airport. This placed it outside the ATZ – a circle radius 2nm centred on the mid point of RW09/27 and extending vertically from the surface to 2000ft aal (elevation: 101ft).

The Gloucestershire Airport 1120 METAR was 22012KT 9999 SHRA FEW016 BKN022 12/08 Q999. The only significant change in the 1150 report was the addition of a minimum visibility of 5000m to the east, the prevailing visibility remaining at 10km or more (9999).

At 1128:16, the PA28 established communications with GLOSTER Approach, reporting 18 miles to the north-east of the Airport and requesting a transit overhead at 3700ft. The controller, operating the combined functions of ADC and APC, responded by requesting further details of the flight and established it was a PA28 en-route to Filton. The flight was provided with a BASIC Service, the Cotswold RPS (995mb) and asked to report overhead, which was readback. GLOSTER Approach does have surveillance radar equipment; however, the controller concerned was not radar qualified.

A Basic Service is described in full in MATS Part 1 Section 1 Chapter 11 Page 4 Paragraph 3. The Service is defined in sub-Paragraph 3.1.1 as

“...an ATS provided for the purpose of giving advice and information useful for the safe and efficient conduct of flights. This may include weather information, changes of serviceability of facilities, conditions at aerodromes, general airspace activity information, and any other information likely to affect safety. The avoidance of other traffic is solely the pilot’s responsibility.”

Also, sub-Paragraph 3.5.1 provides guidance on Traffic Information:

“Pilots should not expect any form of traffic information from a controller, as there is no such obligation placed on the controller under a Basic Service outside an Aerodrome Traffic Zone (ATZ), and the pilot remains responsible for collision avoidance at all times. However, on initial contact the controller may provide traffic information in general terms to assist with the pilot’s situational awareness. This will not normally be updated by the controller unless the situation has changed markedly, or the pilot requests an update. A controller with access to surveillance derived information shall avoid the routine provision of traffic information on specific aircraft, and a pilot who considers that he requires such a regular flow of specific traffic information shall request a Traffic Service. However, if a controller considers that a definite risk of collision exists, a warning may be issued to the pilot.”

At 1134:16, the EC135 crew made their first call to GLOSTER, reporting at 14.3 DME to the south-west, squawking 7000, inbound to join the hold. The controller cleared the flight to the GST NDB (L) [located on the airport] at 3000ft on the Gloucestershire QNH (999mb). He instructed it to take up the hold and placed it under a PROCEDURAL Service. The flight was advised that no delay was expected for an NDB DME approach to RW27.

The Airport is equipped with an ATIS and the guidance in MATS Part 1 Section 3 Chapter 1 paragraph 11.6 (part) states:

“Pilots of arriving aircraft are required to acknowledge receipt of the ATIS message on initial contact with Approach Control using the code letter allocated to the message. If a non-current code letter is used, or if receipt of ATIS is not acknowledged, Approach Control must pass the complete Information to Aircraft detailed in paragraph 9.” Paragraph 9.6, in the same Chapter, states *“After an arriving aircraft has placed itself under the control of Approach Control, the following information shall be passed as soon as practicable:”* (this includes) *“b) Current meteorological information together with the time of observation.”*

On this occasion, the pilot of the EC135 did not acknowledge receipt of the ATIS message and the controller did not provide the flight with the current weather.

The MATS Part1 defines a PROCEDURAL Service as:

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“...an ATS where, in addition to the provisions of a Basic Service, the controller provides vertical, lateral, longitudinal and time instructions, which if complied with, shall achieve deconfliction minima against other aircraft participating in the Procedural Service. Neither traffic information nor deconfliction advice can be passed with respect to unknown traffic. Also, in respect of Traffic Information, it states (in part) “The controller shall provide traffic information, if it is considered that a confliction may exist, on aircraft being provided with a Basic Service and those where traffic information has been passed by another ATS Unit; however, there is no requirement for deconfliction advice to be passed, and the pilot is wholly responsible for collision avoidance. “

The controller obtained confirmation that the PA28 was flying under VFR and a few minutes later at 1139:01, its pilot reported descending to 3000ft *‘to maintain VMC’*. The controller responded *“(callsign) roger in that case..avoid the Gloster overhead please I’ve got..IFR traffic 4 miles southwest of the field inbound to the Gloster hold at 3000 feet”* to which the pilot replied *“understood”*. Traffic information was then provided to the EC135, *“(callsign) opposite direction traffic is a Cherokee descending to 3000 feet to maintain VMC”*. The pilot of the EC135 then informed the controller that he was at 3000ft [999mb] IMC. This was acknowledged by the controller who asked the PA28 if it had copied this information, to which the pilot replied *‘copy traffic’*.

At 1140:41, the PA28 reported at *“...two and a half thousand on 9-9-5 [broadly 2620ft (999mb)] and. passing north of the zone”*, this was acknowledged and the pilot asked to report passing abeam *“the bends in the river”*. The EC135 was then provided an update *“(callsign) that previously mentioned traffic now 2 thousand 5 hundred feet 3 miles north of the field routeing westbound and then towards Filton”*. The pilot acknowledged the traffic information and reported entering the hold (at the GST). The hold is a left-hand one-minute racetrack, based on the inbound track to the GST of 094°M. The EC135 was asked to report ready to commence the approach, the pilot responding that he would first like to carry out a few *‘holds’*.

A change of controller took place at 1142 and at 1145:25, the EC135 called GLOSTER APP. The pilot reported *“(callsign) we’re 2 and a half miles to the..west of the field just turning inbound to the beacon..we popped out of cloud in the hold at 3 thousand feet to find the..Cherokee traffic 2 to 3 hundred feet below us”*. The controller replied *“Roger do you wish to file an Airprox”*, the pilot answered that he would. The PA28 pilot then stated he was *“...level at 2 thousand 2 hundred feet [995mb] if he’s at 3 thousand [999mb] then we’re 8 hundred feet below him”* and later when informed that the helicopter would be filing an Airprox, he responded *“and we copied that and we were clear of your ATZ”*. The PA28 was subsequently transferred to Filton and the EC135 completed a procedure to land, without further comment from either pilot.

From the ATS perspective, the GLOSTER controller provided each flight with traffic information on the progress of the other, in accordance with the respective ATSS being provided. However, the level information had been misleading as the controller had not taken into account the 2 ac were flying on different pressure settings throughout the encounter: the EC135 on a QNH of 999mb and the PA28 on the Cotswold RPS of 995mb. This meant that from the EC135 pilot’s perspective, the PA28 was approximately 120ft higher than reported and vice-versa for the PA28 pilot. It would appear from discussions with the Unit subsequently that the PA28 had been retained on the RPS as it was common practice to do so with transit traffic for terrain clearance purposes. Following this event it appears that, subject to a review, the Unit may place transiting traffic on the QNH when operating in the vicinity of the aerodrome, at or below the transition altitude. This would accord with the principles of reporting vertical position which appear in the MATS Part 1 Section 1 Chapter 6 Page 2 Paragraph 6.3. Also in this Paragraph, it states the RPS is used: *“At, or below, 3000 feet amsl when outside controlled airspace and not in the vicinity of an aerodrome”*.

UKAB Note (2): A review of the Cleve Hill Radar recording shows that at 1139:40, the PA28 was 5nm NE of the airport, squawking 7000 with no Mode C – indeed no altitude data is shown at all throughout the encounter. The EC135, meanwhile, is 4.7nm to the SW, squawking 7000 indicating 3400ft unverified Mode C (1013mb) [broadly 2980ft QNH (999mb)]. By 1141:06, the PA28 is 3nm NNE, having now adopted a westerly track, while the EC135 is just reaching the GST. The EC135 turns outbound and for the next 90sec both ac are tracking W, about 1½nm apart. By 1143:36, the PA28 has turned SSW and the distance between them starts to reduce (the PA28 commenced its left turn when 3.4nm NW of the airport). The two ac continue to converge and by 1144:16, the EC135 has crossed ahead of the PA28 and is now in the latter’s 1:30 position at 0.4nm; minimum vertical separation at this point is estimated at 260ft, based on the EC135’s Mode C readout of 3300ft Mode C (1013mb) and the PA28 pilot’s earlier RT report at 1140:41 of flying at 2500ft RPS (995mb) – broadly 3040ft (1013mb). A short time later, the EC135 turns L and once more the 2 ac are converging from 0.5nm apart, with the EC135 to the W of and to the R of the PA28. The distance reduces to 0.1nm when abeam at 1145:04 – the ac now only

represented by SSR contacts with no supporting primary data; maximum vertical separation at this point is now estimated at 660ft as the EC135 indicates 3400ft (1013mb) compared to the PA28 pilot's subsequent RT report after the Airprox that he had descended to "...level at 2 thousand 2 hundred feet [995mb]..." – about 2740ft (1013mb). Over the next two sweeps the tracks cross at a shallow angle before the EC135 then turns left towards the GST at 1145:28, now in the PA28's 9 o'clock at a range of 0.3nm, whereupon the ac rapidly diverge.

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 and a report from the appropriate ATC authority.

It seemed to the Board that this Airprox report, occurring between IFR helicopter traffic in receipt of a PROCEDURAL service and the PA28, operating VFR under a BASIC ATS, had perhaps stemmed from an initial perception that there was less vertical separation between these two ac than there actually was.

The comprehensive ATSI report had shown that the controller concerned was unable to utilise the airport's primary surveillance radar as he was not qualified in its use: therefore any traffic information that was supplied by him was based on pilots' RT reports. In this procedural 'non-radar' scenario, each crew had been provided at various stages with traffic information on the progress of the other in accordance with the respective ATSS being provided. However, it was clear from the outset that the controller had not taken into account that the 2 ac were flying on different pressure settings. Thus the level information proffered had been misleading and not related to the same pressure datum. Controller Members emphasised the importance of clarity in the passing of level information and agreed it would have been preferable to place the transiting PA28 on the aerodrome QNH - as the EC135 – especially as it was transiting through the area of the GST hold occupied by the helicopter. In the Board's view, this would have simplified the situation for pilot and controller alike.

Evidently APP had earlier requested the PA28 crew to avoid the aerodrome overhead, recognising that with the EC135's approach there was potential for a conflict between the two ac. However, in making this request APP had set the scene for another potential conflict with the helicopter when it was holding to the W of the airport at 3000ft QNH. Pilot Members were keen to point out that the PA28 crew might not have known where the Gloucestershire GST IFR hold was located and possibly assumed they would be able to remain clear of the EC135 by acceding to the APP controller's request. However, the PA28 pilot, in response to the traffic information on the helicopter, had reported descending to the same altitude, with the RPS set, to maintain VMC resulting in a theoretical difference in level of only 120ft. Clearly, there was no responsibility placed on the controller here to separate these two ac and it had been shown that the helicopter crew would only have been afforded separation by ATC against other participating IFR flights under the PROCEDURAL ATS – of which there were none – not other VFR flights like the PA28. That said, traffic information was passed about the only VFR traffic affecting the EC135 in conformity with established practice. Nonetheless, in 'controllership terms' a military controller Member thought that APP might have done more here by instructing the PA28 to fly at a specific altitude, thus taking positive steps to resolve the potential for conflict. However, civilian controller Members emphasised that the principle of 'see and avoid' prevailed here between the VFR PA28 and the instrument traffic and it was plain from the PA28 pilot's report that he was aware of the presence of the helicopter and eventually saw it as it flew in and out of cloud above his aeroplane, meanwhile descending to 2200ft RPS to maintain VMC so that he could comply with his responsibilities to 'see and avoid' other traffic in this Class G airspace. A GA pilot Member observed that APP had provided a good level of information to both crews here which had assisted their situational awareness and helped the PA28 pilot to spot the helicopter. However, it seemed that the EC135 pilot had not been reassured by this and was perhaps understandably concerned when he fleetingly spotted the PA28 below his ac. It was not feasible to determine independently the actual separation that pertained here because there was no Mode C evident from the PA28. Nevertheless, in the Board's view, the PA28 instructor had ensured that he was able to fulfil his responsibilities and this Airprox was the result of a sighting by the IFR EC135 pilot of transit VFR traffic.

The absence of Mode C data from the PA28 was a concern as although its pilot had reported it was selected 'on', none was evident on the radar recording whatsoever. Whether the Mode C was inoperative or merely not selected 'on' was unclear. Whilst in this case the EC135 was not fitted with TCAS and ATC was not providing a radar service, the lack of the PA28's Mode C indication did deny other ATC radar units essential SSR data on transit traffic and, moreover, rendered TCAS ineffective in any ac so equipped in the vicinity. Pilots of Mode C fitted ac should not underestimate the importance of their ac's altitude information in preventing collisions, especially in the busy uncontrolled environment of Class G airspace. The Board most strongly encouraged all pilots to ensure that

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their transponders were working correctly and selected to transmit Mode C throughout their flight in accordance with national procedures. Pilots should be in no doubt that the mere transmission of Mode C data is a potential lifesaver, but they might never know when it has actually prevented a collision!

From the foregoing it could be contended that the minimum theoretical vertical separation that pertained here was 260ft, based on the EC135's Mode C readout of 3300ft (1013mb) and the PA28 pilot's earlier RT report of flying at 2500ft RPS (995mb). This minimum was broadly in the order of that estimated by the reporting pilot. But because of the absence of the aeroplane's Mode C indication, it was not clear at which point the PA28 had descended to 2200ft RPS thereby potentially increasing the vertical separation to 660ft when the tracks crossed at close quarters. Given that the PA28 pilot was operating VFR, content with his own separation beneath the helicopter which he had seen, and the EC135 pilot was maintaining level holding flight aware of the aeroplane beneath him with no immediate intention to descend, the Members concluded unanimously that there was no risk of a collision in the circumstances conscientiously reported here.

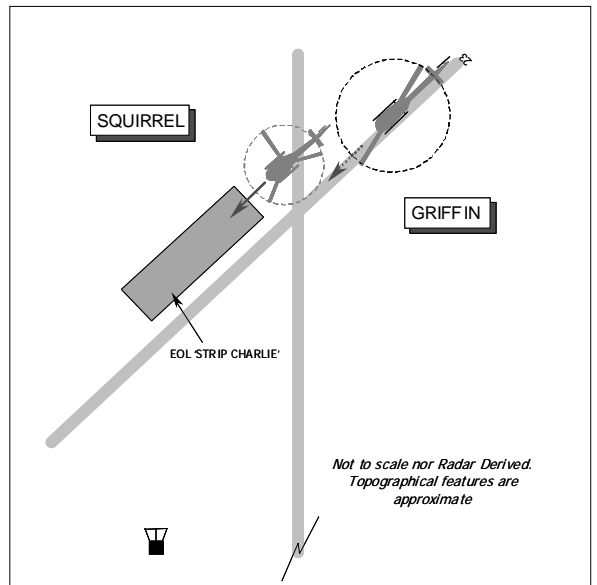
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Sighting report.

Degree of Risk: C.

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Date/Time: 16 March 1224
Position: 5247N 00240W (O/H RW23 at Shawbury - elev 249ft)
Airspace: MATZ/ATZ (Class: G)
Reporting Ac Reported Ac
Type: Bell 412 Griffin AS350 Squirrel
Operator: HQ AIR (Trg) HQ AIR (Trg)
Alt/FL: 800ft↑ ↓1000ft
 QFE (1022mb) QFE (1022mb)
Weather VMC CLOC VMC
Visibility: 35km 10km+
Reported Separation:
 150ft V/100m H Not seen
Recorded Separation:
 Not recorded



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BELL 412 GRIFFIN HELICOPTER PILOT, a QHI, reports he was conducting an instrument training sortie with the student pilot flying the helicopter on instruments in the right seat whilst he as the instructor and safety pilot occupied the left seat. They were in receipt of a TRAFFIC Service from Shawbury TALKDOWN on 278-675MHz whilst carrying out a planned practice “go-around” following a Surveillance Radar Approach (SRA) to RW23. A squawk of A0230 was selected with Mode C; neither TCAS nor Mode S is fitted.

Operating in VMC some 1400ft below cloud with an in-flight visibility of 35km, his Griffin was positioned slightly R of the centreline for RW23 and maintaining runway track. Overhead the aerodrome heading 225° at 90kt, on passing approximately 800ft QFE (1022mb) in the climb now under VFR, he observed the underside of a Squirrel helicopter about 200ft above them, slightly ahead of his helicopter, flying in the same direction and at the same speed in a level attitude. A moment later the attitude of the Squirrel altered tail-down whence the Squirrel began an autorotative descent to the designated engine-off landing (EOL) strip which is immediately adjacent to the R of the runway and runs parallel with RW23. As a QHI he recognised this as an entry into autorotation so he took control of his helicopter from the student PF and altered course to the L to avoid the other helicopter and clear the Squirrel’s descending flight path. Assessing the risk of a collision as “high”, he estimated the minimum separation as 150ft vertically and 100m to the R. An Airprox report was not filed on RT at the time and the sortie completed without further incident. He later reported the Airprox verbally to the Station Flight Safety Officer; his Unit; HQ DHFS and ATC. His Griffin has a black & yellow colour-scheme and the HISLs were on.

UKAB Note (1): In a further telephone call with UKAB Staff the Griffin QHI explained that he was slightly R of the RW centreline throughout the overshoot executed by his Student. He reaffirmed that he was completely unaware of the presence of the Squirrel until it was spotted vertically above his helicopter, whereupon he immediately took control and initiated an avoiding action L turn.

THE AS350 SQUIRREL HELICOPTER PILOT [SQUIRREL (A)], the QHI of one of two Squirrel helicopters operating in the cct to EOL ‘Strip Charlie’, reports he was completing an annual assessment on a qualified helicopter pilot and at the reported time of the Airprox was operating VFR in the visual cct at Shawbury with RW23 in use. Listening out with TOWER on the quiet frequency [Stud 3], one EOL was completed to ‘Strip Charlie’ from 1000ft QFE [normal rotary-wing cct height] but at no time was a Griffin helicopter seen by either pilot, nor was the presence of one communicated by ATC, he thought. However, an Agusta 109 was reported on long finals for an instrument approach. The EOL was completed and the helicopter returned to dispersal without incident. His Squirrel has a black & yellow colour-scheme and the HISLs were on. SSR was selected to ‘standby’; neither TCAS nor Mode S is fitted.

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THE SHAWBURY AERODROME CONTROLLER (ADC) reports he was the screen controller in the VCR acting as mentor to an experienced (multi tourist) TOWER trainee. They had been operating the position with RW23 in use for about 1 hour when they were relieved at 1300. Approximately 1 hour after being relieved, the ATC Supervisor informed him that a Griffin helicopter pilot who had been executing an SRA during the period was filing an Airprox involving a Squirrel helicopter that the Griffin pilot believed had been carrying out an EOL to strip 'Charlie'. The Griffin pilot reported that the Squirrel had infringed the approach lane and that separation had been lost. Asked whether any ac crews had reported anything on RT, he replied that no reports had been made. The training session had been of "medium intensity" but was made more complex due to the runway in use and the type of operations taking place in the Main Operating Area.

THE SHAWBURY ATC SUPERVISOR (SUP) reports that a call was received from the Griffin pilot at 1253. It was reported that at approximately 1222, the Griffin was overshooting from an SRA to RW23 and slightly offset to the R when a Squirrel helicopter positioning for an EOL to 'Strip Charlie' turned in front of and slightly above the Griffin flown by the reporting pilot. The Griffin QHI indicated that he assessed the separation to be 100ft and he felt he needed to report an Airprox. At the time the pilot called the SUP it was not possible to determine the other ac involved as no Airprox report was made on the TOWER (quiet) frequency at the time.

MIL ACC reports that the subject Griffin helicopter crew made contact with Shawbury TALKDOWN on 278:675MHz (stud 12) whereupon, at 1219:37, the controller identified the ac and obtained a read back of the QFE set – 1022mb. The reported surface wind was 240/10kt. From this point the controller passed appropriate instructions to the Griffin crew as would be expected during a normal SRA to overshoot. At 1222:19, passing 3nm from touchdown on centreline, TALKDOWN transmitted the final clearance to the Griffin crew [relayed from TOWER], "clear to overshoot acknowledge" to which they responded at 1222:22 "clear to overshoot [C/S]". The controller advised that the ac was on centreline and, at 1223:44, that the Griffin was "1 mile passing missed approach point". Being on centreline, TALKDOWN continued to pass appropriate instructions to the Griffin crew until 1223:59, when the crew transmitted "..high overshoot stud 9 [APPROACH]" which the controller immediately acknowledged at 1224:01. Some 35 sec later at 1224:36, a different voice from that previously (assumed to be the QHI) transmitted to TALKDOWN ".. [Griffin C/S] to..stud 9".

Meanwhile, the crew of Squirrel (A) had made contact with Shawbury TOWER on 378-45MHz (Stud 2) at 1216:08, "Shawbury Tower [Squirrel (A) C/S] is Hodnet join for area right strip Charlie with Echo copied. [Note: TOWER was manned by a Mentor screening an experienced trainee.] This was acknowledged by TOWER at 1216:13, "[Squirrel (A) C/S]..Shawbury TOWER, join surface wind 2-4-0 10 knots", which was immediately acknowledged by the crew - "clear join [Squirrel (A) C/S]". Between 1216:40 and 1217:09 TOWER then transmitted taxi instructions to another ac and acknowledged a formation changing to APPROACH. At 1217:30, another Squirrel crew - Squirrel (B) C/S – called to join from TALKDOWN "Shawbury TOWER, [Squirrel (B) C/S] from PAR to join..23 right hand". Responding at 1217:30 TOWER instructed "[Squirrel (B) C/S] Shawbury TOWER join surface wind 2-4-0 10 knots, there's 2 [ac] in area right, 1 [ac] joining through Hodnet for area right and Strip Charlie" - [the EOL strip to the R of RW23]. At 1217:32, the crew of Squirrel (B) responded "That's copied and I shall also be for strip Charlie, [Squirrel (B) C/S]". At 1217:45 the crew of Squirrel (A) advised "[Squirrel (A) C/S] 30 seconds to cross", which was acknowledged by TOWER at 1217:48: "[Squirrel (A) C/S] cross 3 in area right one other just joined from...radar for Charlie also". Whereupon the crew replied "[Squirrel (A) C/S] back to stud 3" - a quiet frequency (262-875MHz) monitored by helicopters manoeuvring on the airfield.

Between 1217:56 and 1219:42, TOWER communicated with other unrelated ac and at 1219:57 broadcast both on Studs 2 & 3 "Griffin 6 miles overshoot further", and later at 1222:24 "Griffin 3 miles overshoot". TOWER communicated with various other ac until 1225:54, when information about further PAR traffic was broadcast "Agusta 109 6 miles land".

Stud 3 is a quiet frequency monitored by helicopters manoeuvring on the aerodrome. After initial radio checks, pilots make 'blind calls' of their position and TOWER broadcasts essential information as necessary. At 1216:18, TOWER broadcast about a Squirrel - Squirrel (A) - "...joining through Hodnet for strip Charlie". At 1217:59, the crew of Squirrel (A) advised "[C/S] check stud 3 for Charlie" which was acknowledged by TOWER 5 sec later "..loud and clear stud 3". At 1219:57 TOWER broadcast "Griffin, 6 miles, overshoot, further". At 1220:40, the crew of Squirrel (B) transmitted "...FINALs engine off Charlie right hand side" to which TOWER advised "[Squirrel (B) C/S] caution there's 2 crossing ahead" which the crew of Squirrel (B) reported at 1220:52, "visual". TOWER's broadcast about the Griffin was made at 1222:24, "Griffin 3 miles overshoot". Just over 1min later at 1223:35, the crew of Squirrel (A) broadcast "[Squirrel (A) C/S] FINALs engine off Charlie". Later at 1225:19, the crew of Squirrel

(B) broadcast “[Squirrel (B) C/S] *DOWNWIND engine off Charlie*”. The crew of Squirrel (A) advised at 1225:36, “..complete with Charlie stud 2”.

At 1225:57, the crew of Squirrel (A) transmitted on the TOWER frequency - Stud 2 – “[Squirrel (A) C/S] *complete with Charlie request cross..23 for dispersal*”. TOWER approved this at 1226:03 “[Squirrel (A) C/S] *cross*” which the crew acknowledged at 1226:05 “*cross [Squirrel (A) C/S]*”.

The Griffin crew carried out a surveillance radar approach (SRA) – a non precision airfield approach - under the control of Shawbury TALKDOWN and was given appropriate instructions under the TRAFFIC Service accordingly. All liaison calls were correctly made by TALKDOWN to the ADC, at the appropriate point, and a clearance obtained to overshoot [for a further practice approach] at 3nm from touchdown. After an uneventful approach, the QHI reports that during the overshoot he sighted a Squirrel helicopter, 200ft above his ac and so took control and broke left to remain clear of the Squirrel. The QHI advised the SUP that on overshooting his helicopter was slightly offset and he reports his helicopter was positioned slightly R of the centreline for RW23 maintaining runway track when the Airprox occurred

[UKAB Note (2): Initial review by the SUP suggested that the Squirrel sighted by the Griffin pilot was [Squirrel (B)], but this is not supported by the transcript timings. Given that the Griffin flying at 90kt was “*1 mile passing missed approach point*” at 1223:44, suggests the Griffin was over the RW23 threshold some 40sec later at or about 1224:24. Thus it is probable that the reported Squirrel sighted was in fact Squirrel (A) whose crew called “...*FINALS engine off Charlie*” at 1223:35.]

Both the RAF FLIPs En-route Supplement - BINA and the UK MIL AIP at Vol 2, clearly state that helicopters operate to within 50m of both sides of the runway and circuit activity will not be included in the final clearance. Whereas the QHI in Squirrel (A) correctly stated that an Agusta 109 was reported on long finals for an instrument approach (broadcast by TOWER on stud 2 and stud 3 at 1225:54), he stated in his report that at no time was a Bell 412 Griffin helicopter seen by either pilot, nor was the presence of one communicated by ATC. However, broadcasts about the subject Griffin were made by TOWER on both Stud 2 & Stud 3 at 1219:57 - “*Griffin, 6 miles, overshoot, further*” and at 1222:24 - “*Griffin 3 miles overshoot*”.

The Mentor screen ADC stated in his report that the training session had been of medium intensity, but was made more complex due to the runway in use and the type of operations taking place in the main operating area. The use of RW23 (surface wind 240/10) meant that the EOL practice area for RW23 – ‘Strip Charlie’ - was very adjacent to the RW itself, which is well known to Station based helicopter crews.

THE DEFENCE HELICOPTER FLYING SCHOOL (DHFS) comments that operations at Shawbury have always been very busy as a multitude of flight operations happen simultaneously. Where these operations conflict with each other they are generally mitigated by sound captaincy decisions, pragmatic airmanship and common sense. When simultaneous actions occur which might cause collision or an accident then action must be taken to mitigate and reduce the potential hazard occurring again.

Action was taken immediately in that EOLs to ‘Strip Charlie’ were stopped and an internal review was conducted [a copy was enclosed with Griffin pilot’s report]. A new EOL strip is being surveyed which is aligned with RW23 but is sufficiently displaced to prevent this happening again.

UKAB Note (3): This Airprox occurred outwith the coverage of recorded radar.

UKAB Note (4): The Shawbury Flying Order Book at Section C Part 4 Order 2 - Instrument Flying Procedures - requires:

6. Overshooting. Overshoots are to be initiated from the MAP or DH under the following conditions:

a. VMC. *Ac cleared to overshoot are to fly on Rwy track, climbing not above 1500ft QFE before continuing as directed.*

HQ AIR (TRG) comments that this incident involved IFR traffic integrating with VFR traffic. The proximity of EOL ‘Strip Charlie’ to the active RW was a major factor and action was taken immediately following this incident prohibiting EOLs to ‘Strip Charlie’ whilst an internal review was conducted. The broadcast RT call about the Griffin

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was made by the TWR Controller as is required, but it does not seem to have been assimilated by the Squirrel crew. The Griffin crew were not given circuit information, in accord with the local unit procedures promulgated in the UK MIL AIP, and were subsequently concerned during their overshoot when they encountered the Squirrel executing the EOL.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board noted that after extracting himself from this difficult situation the Griffin QHI had not reported the Airprox on the RT. Clearly, avoiding action was the priority but an RT call when practicable to highlight the occurrence to ATC would certainly have focused the controller's attention on what had happened. Controller Members recognised that, understandably, the ADC might not have been able to recall this specific traffic scenario owing to lack of any 'heads-up' at the time. This was unfortunate and, as perhaps might be expected, the controller's report added nothing to the understanding of the events related here which, despite the best endeavours and comprehensive report provided by Mil ACC, did not clarify the aerodrome control aspects of this Airprox. However, an Advisor and controller Member (previously validated at Shawbury) suggested that from the Mentor and trainee's perspective looking out of the VCR, NE toward the approach, it would have been difficult for the controllers to judge that there was indeed a conflict at all.

The absence of a call at the time also complicated confirmation of the identity of the other helicopter involved and subsequent acquisition of its pilot's report but it seemed clear to the Board that Squirrel (A) was the reported ac. However, from their individual accounts, neither Squirrel pilot conducting EOLs at the time was cognisant of the Griffin at all. Consequently, with only the Griffin QHI aware of the incident at the time, the Board's assessment was, of necessity, based largely on his report and the events as related in the RT transcripts and the Mil ACC report.

The Board was briefed on the comprehensive review of the use of EOL 'Strip Charlie' subsequent to this Airprox but it was plain to the Members that there are some aspects of the Shawbury visual cct procedures which are unorthodox due to the very intense and complex training scenario, resulting in some non-standard local procedures tailored specifically to the Unit's requirements. Members noted the absence of any cct state relayed to the Griffin pilot by TALKDOWN with the clearance to overshoot which, whilst in accord with the promulgated local procedures, is unusual. It was explained by a controller Member that the complexity of operations conducted within the cct area such as confined area or sloping ground work, in addition to load-lifting, EOLs and other cct traffic would make any cct state message issued protracted, complicated and open to error or misinterpretation. Members accepted this point but were still concerned that pilots of instrument traffic flying through are not appraised of other traffic therein, either from their clearance on TALKDOWN or by direct contact with TOWER on Stud 2 when flying through. Clearly, Members recognised that Station-based QHIs would be intimately aware of the whole gamut of operations conducted in this unusual environment but with predominantly student pilots operating in this intense training scenario there was significant potential for the unexpected to occur. Consequently, this demanded that lookout was of the highest priority.

The Mil ACC Advisor emphasised that the TALKDOWN controller's responsibility ended at the MAP and the conclusion of the SRA, which controller Members stressed was an aerodrome approach, not a precision runway approach, with an inherently less accurate line-up. It was plain from the TALKDOWN transcript that the Griffin had been on the centreline from 3nm. Despite this, after the MAP the QHI reports his helicopter had drifted slightly R of the RW centreline whilst commencing the 'overshoot for further' and converting to visual reference to 'fly-through' the aerodrome. In the absence of any recorded PAR data, the amount that the Griffin was displaced to the R - and hence towards the FINALs area for the EOL 'Strip Charlie' - could not be determined with any certainty. Conversely, nor could the location of the Squirrel be confirmed at the time of executing the EOL. Any displacement to the R of centre for the Griffin or left of the final approach for 'Strip Charlie' by the Squirrel would result in a potential conflict in the cct area and it was clearly up to the QHIs involved to lookout for and take account of other traffic. From his own account and the Mil ACC report, the pilot-in-command of Squirrel (A) had plainly not recalled the broadcasts made by TWR on Stud 3 - the quiet frequency - about the Griffin at 6 & 3nm from touchdown. 'Muting out' of receivers in the cct was clearly feasible in a teaching environment but not suggested here. That the broadcasts were made was plain from the RT transcript, but these were not apparently heard or heeded. This was, in effect, parallel runway operations to RW23 and EOL 'Strip Charlie', which were in use concurrently,

whereby circuiting pilots must take due regard of the IFR ac during these simultaneous operations and adjust their ccts accordingly. But to do this pilots in the cct must pay attention to the relevant broadcast so that they can sight the instrument traffic in the first instance and 'give way' if necessary.

Members were reassured by the swift action taken by the Unit after this Airprox to reduce any potential for a recurrence by terminating the use of EOL 'Strip Charlie', a point that was reinforced by the Air Command pilot training Member. Nonetheless, helicopter pilot Members believed there was an ac Captaincy issue here for it was ultimately the responsibility of the respective P-i-C to ensure de-confliction under these procedures. In the Squirrel there was a lack of awareness of the Griffin executing the overshoot from the SRA and the conflict was not spotted at all. However, it was stressed that the Griffin might not have been visible as the Squirrel turned R – belly-up to the Griffin – before placing the latter astern and below in the Squirrel pilots' blind arc when it steadied on FINALS for 'Strip Charlie'. Similarly the Griffin 'safety pilot' had not spotted the Squirrel in the cct earlier in the prevailing CC BLUE conditions nor the potential for conflict if his student was to fly R of the RW23 centre-line after the MAP. In the helicopter pilot Member's view the Griffin QHI was responsible for ensuring that his helicopter was recovered promptly to the sanctuary of the RW centreline from the MAP. Members recognised that this was spelt out in the FOB – reproduced at Note (4) - which entreats pilots cleared to overshoot “.. to fly on Rwy track..” - down the length of the RW during the overshoot – thereby regaining the centreline visually and ensuring that they were flying over the runway clear of other circuiting helicopters. On the other hand, equally it might have been the case that the Squirrel had strayed toward the undershoot to RW23 and there was nothing to confirm that Squirrel (A) was not somewhat left of the normal EOL strip approach area: with the close proximity of 'Strip Charlie' to RW23 there was certainly little margin for error here. Pilot Members believed that the situation in which the Griffin QHI found himself was perhaps the result of allowing his student 'a little too much rope'. Given the promulgated warning of helicopters operating to within 50m of both sides of the runway and no 'DEADSIDE', there seemed to the Board there was an implicit responsibility on instructors to ensure that students in their charge were not given undue latitude during this phase of the approach/climb-out to ensure that the transition from IFR to VFR flight was conducted with due regard for other circuiting ac. Practising instrument flying in a mixed traffic environment could be challenging; whereas at other aerodromes TOWER would normally be responsible for the control of VFR traffic flying in the circuit and for ensuring the safe integration and sequencing of the arrival and departure of visual and instrument traffic, here, it is effectively an uncontrolled but regulated cct. Experienced instructor pilot and controller Members alike were keen to point out that in this cct, with VFR ac operating on a 'quiet' frequency in a broadly uncontrolled manner, it was imperative that with the IFR student PF 'under the hood' that the visual safety pilot complied strictly with established procedures. It seemed to some a foregone conclusion that the Shawbury RHD cct area would invariably be busy with VFR traffic. Thus with lookout of the highest importance, pilot Members suggested that the Griffin pilot would naturally have been looking out for other circuiting helicopters in this highly regulated but 'hands-off' uncontrolled environment. It was therefore fortunate that the Griffin QHI's scan revealed the presence of the Squirrel when he finally spotted it above his helicopter and promptly moved out of its way. Weighing all these factors carefully for relevance, the Board concluded unanimously that this Airprox had been the result of a conflict in the visual cct resolved by the Griffin QHI. Nevertheless, with the crew of Squirrel (A) apparently unaware of the Griffin beneath them, swift appreciation of what was happening by the Griffin QHI was clearly instrumental in prompt resolution of this conflict as the Squirrel started to descend on top of his helicopter. With no warning feasible from ATC, it would seem, and only one pilot cognisant of the danger beforehand, in the Board's view, the safety of the helicopters involved had certainly been compromised in the circumstances conscientiously reported here.

The Board considered further whether this method of operation was appropriate in such an intense training scenario. Highly experienced helicopter pilot and controller Members familiar with operations at Shawbury understood the complexity of the cct procedures well and explained that these had been evolved over time to extract the maximum training benefit from the resources available. It was contended that this was the only way in which the DHFS could operate at this level of intensity whilst still achieving their training objectives with an acceptable level of safety. However, this state of affairs did not sit easy with an experienced Air Command instructor pilot Member who suggested that these procedures and methodology did not 'fail-safe' and he expressed reservations about the 'modus-operandi' revealed here. The Board was briefed that a full review of Shawbury procedures had taken place in 2007. Moreover, the Station had acted swiftly following this Airprox and had stopped using EOL 'Strip Charlie' that had been the source of the conflicting traffic. Therefore, after a lengthy and wide-ranging debate it was concluded that a further Safety Recommendation on this topic was not warranted.

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PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A conflict in the visual cct resolved by the Griffin QHI.

Degree of Risk: B.

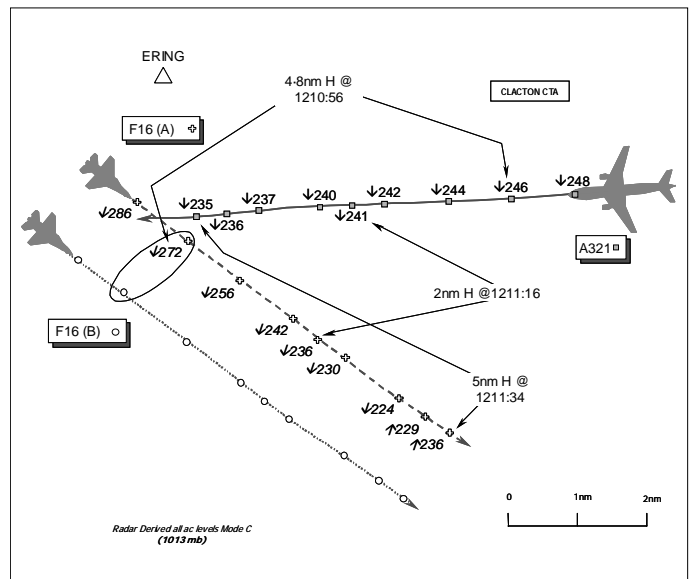
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Date/Time: 1 April 1211
Position: 5133N 00141E (4nm SE of ERING)
Airspace: Clacton CTA (Class: C)
Reporters: LTCC TC East/LJAO SE TAC

<u>1st Ac</u>	<u>2nd Ac</u>
Type: A321	F16 pair
Operator: CAT	Foreign Mil
Alt/FL: FL250↓	↓170
Weather VMC NR	VMC CAVOK
Visibility: 10km+	10km+

Reported Separation:
 Nil V/2-5nm H Not seen

Recorded Separation:
 Nil V @ 2.2nm H
 2nm Min H @ 500ft V

**BOTH CONTROLLERS FILED****PART A: SUMMARY OF INFORMATION REPORTED TO UKAB**

THE LTCC EAST TACTICAL RADAR CONTROLLER (TC E TAC) reports the Sector was banded and he was operating without a co-ordinator when he took a telephone call from the LJAO SE Sector Tactical Controller (LJAO SE TAC) regarding a pair of F16s, which was at about FL360. Having previously received a pre-note from LJAO SE TAC about the F16s, he already had the squawk, callsign and routeing of the ac, when told that LJAO needed to descend the F16s to FL200 before the FIR boundary. He agreed to the LJAO SE TAC's request to descend the F16 pair taking 1000ft vertical separation based on Mode C above his London inbounds and avoid his overflights.

When descending the A321 under a RCS to FL150 in the vicinity of ERING, STCA activated at low-severity – White - between the A321 and the F16 pair – squawking A1645 - but no Mode C was evident at this point. As the ac passed each other separated horizontally, he thought by about 1.5nm laterally, the F16's Mode C appeared at almost the same level as that of the A321. Consequently, he believed that standard separation had been lost.

THE LACC SECTOR 12/13/14/27/28/32/34 (CLACTON) PLANNER CONTROLLER (CLN PLAN) reports that he was operating as CLN PLANNER initially with S12-14 banded together, then after the Sector was split, as S13/14 PLANNER. Whilst banded he had received a Cleared Flight Path (CFP) request from LJAO SE TAC for a pair of F16s to head S, which he agreed subject to them being 2000ft above another westbound ac, not the A321. Whilst the F16s were still N of LOGAN, LJAO then informed him that BELGA RADAR were unable to accept the F16s at FL370, instead now requiring them to be at FL200. He agreed, therefore, that LJAO SE TAC could remain on a southerly track descending on top of their Heathrow inbound traffic, but that LJAO would need to co-ordinate with TC below FL250. The F16 pair was then observed to turn L which put them into potential conflict with another Heathrow inbound ac. As LJAO SE TAC was sitting behind him the quickest way to resolve the situation was to verbally confirm that the formation were turning back onto a southerly track. At the same time LJAO SE TAC confirmed that the F16 pair was descending on top of the A321, which they were just about to transfer to TC E in accordance with the Standing Agreement. After the A321 had been transferred to TC E, and had been given further descent he observed the F16 pair pass, he thought, slightly behind the A321 at a similar level. Although he, his CLN TAC controller and the S12 TACTICAL & PLANNER controllers had all observed the incident, the time factor precluded them all from being able to warn TC E.

THE LATCC (MIL) LJAO SE SECTOR TACTICAL CONTROLLER (LJAO SE TAC) provided a candid and comprehensive account reporting that the F16s were routeing 10nm E of BANEM, JACKO, RAPIX, KOKSI at FL370 whilst returning from a Tactical Leadership Programme (TLP) exercise in UK airspace. Shortly after taking

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control of the F16s, the flight was pre-noted to BELGA RADAR, who said that the F16s' destination would necessitate them being at FL200 at KOK. Although co-ordinated at FL370 with S12/13/14 (that was bandboxed) SE TAC subsequently went back to the LACC PLAN to ask for the descent. Confirming that Standing Co-ordination would be taken on top of the Heathrow inbound, LACC PLAN asked that an over-flight at FL340 be avoided. Instructing the F16s to descend, initially to FL250, SE TAC subsequently corrected this instruction and asked the F16s to stop descent at FL300, which was acknowledged. A short time later, further descent to FL270 was issued to remain above an A321 inbound to Heathrow whilst keeping the F16 pair on a southerly heading initially before turning them towards KOK to run ahead of another Heathrow inbound at FL310. LACC S13/14 were concerned about the F16s' track against this other Heathrow inbound [not the subject A321] and called across the Ops Room to SE TAC from their Console [not on the landline] about it. Whilst trying to reassure LACC S13/14 verbally about running ahead of their other Heathrow inbound ac, SE TAC became distracted from the situation with the A321. When the controller looked back at the F16 flight, it was indicating FL243 Mode C and was about 2nm from the A321 at the same level. No avoiding action was issued; instead SE TAC asked the F16 lead pilot to "confirm you're levelling FL270". Whilst evidently not the correct phraseology in this situation the F16 lead pilot responded that he was climbing to FL270. Traffic information was not given to the F16 pair about the A321.

THE A321 PILOT reports he was inbound to London Heathrow and in receipt of a RCS from LTCC. The incident occurred about 24nm SE of CLACTON VOR heading 270° at 300kt whilst descending through FL250 in VMC. The F16 pair was first spotted 10-20nm away whilst descending from about 3500ft above his ac. TCAS enunciated a TA only – no RA was triggered. Minimum horizontal separation was 2.5nm when the F16s passed through his level and no avoiding action was taken. He assessed the Risk as "low".

THE No2 F16 PILOT reports that he was flying as the wingman of the F16 pair; the formation lead pilot was unable to provide a report because he was detached on operations.

The wingman commented some 6 weeks after the event that they were returning to Kleine-Brogel from a TLP exercise in CAVOK conditions, he thought under VFR. Whilst flying under the direction of ATC he reports that no other ac was seen. Neither TCAS nor any other form of CWS is fitted.

ATSI reports that the A321 was under the control of the TC E TAC radar controller. Traffic was light and the Sector was bandboxed, with no Co-ordinator present. At 1200, LJAO telephoned the E Sector, initially to request a Cleared Flight Path (CFP) for the subject F16 pair. However, because there was a possibility of the flight wishing to climb higher, the CFP was not requested but the flight's planned routeing, via BANEM-LOGAN-RAPEX, was passed. LJAO SE TAC said they would call back. Some 6min later, LJAO SE TAC telephoned the E Sector to confirm that the F16s had climbed to FL370. LJAO SE TAC stated that the next ATSU wished to take the flight at FL200. Although the phrase 'request co-ordination' was not used, the LJAO SE TAC requested to descend through TC E TAC's airspace to FL200, taking 1000ft Mode C separation against all aircraft descending into the London airports (Heathrow and Gatwick were then specifically mentioned) and avoiding all overflights, if the East Controller "was happy". TC E TAC confirmed "that's fine".

The A321 crew established communication with TC E TAC at 1209, reporting descending to FL250, heading 280°, whereupon the crew was instructed to turn L heading 270° and descend to FL150, to be level abeam SABER. STCA activated at 1211:05, between the A321 and the F16s. At the time, there were no Mode C returns displayed from the F16s, although the conflict alert box showed them at FL265. They had passed through the A321's 12 o'clock - 3.7nm ahead. TC E TAC had no reason to believe that the formation would not maintain the 1000ft separation as agreed with LJAO SE TAC. Consequently, neither traffic information nor avoiding action was issued. The closest point of approach occurred at 1211:48, when the nearest of the F16 pair was 2.1nm S of the A321, the subject ac being at the same level. It was established that even if the F16's Mode C had been present, the controller would have had little time to realise they were descending to a conflicting level with the A321. The F16 pair's rate of descent would only have shown one sweep when they were less than 1000ft above the A321. No comments were made by the controller or the pilot of the A321 about the formation and the flight was transferred to its next Sector at 1212.

No apparent civil ATC causal factors.

MIL ACC reports that LJAO SE TAC was controlling a pair of F16s in transit to Belgium at FL370 having taken part in a TLP exercise in UK airspace. The controller had been on console for 45min and the workload was described as low. The F16s were expected and were observed on radar prior to their initial call on RT to the controller. LJAO SE

TAC believed that the F16s were returning to Florennes (EBFS) and issued headings for KOKSI (KOK) not the F16s originally requested routeing via NAVPI. It wasn't until the BELGA RADAR controller requested the F16s be at FL200 that their final destination of Kleine-Brogel (EBBL) was ascertained.

Prior to the F16s calling on frequency, LJAO SE TAC controller had pre-noted TC East to discuss a CFP on their expected routing, BANEM, LOGAN, RAPIX at FL190. The agreed transit level in the Airspace Coordination Notice (ACN) for TLP traffic was FL190. The F16s made initial contact on 275-62 MHz at 1201:54. LJAO SE TAC acknowledged the call and the F16 flight responded at 1201:56, "[F16 C/S] *is squawking 1-6-4-4. We are radial 3-3-0, 20 miles from Marham at flight level 9-0, for IFR pick up*". LJAO SE TAC confirmed at 1202:03, "[F16 C/S] *roger confirm you require to transit at flight level 1-9-0 back to Belgium*". The lead F16 pilot replied at 1202:08, "*Negative I'm requesting to climb 3-7-0 through NAVPI and then ??? then ???*". The last 2 words are unintelligible and believed to be reporting points. LJAO SE TAC acknowledged the request and instructed the F16 flight to climb and squawk ident. At 1202:34, LJAO SE TAC transmitted, "[F16 C/S] *identified entering the upper air, radar control. Confirm both aircraft within 1nm at the same level*"; that was confirmed by the lead pilot. LJAO SE TAC then pre-noted BELGA RADAR providing an estimate for KOKSI of 1215 at FL370. The BELGA RADAR controller instructed LJAO SE TAC to call back for a handover and then at 1204:20 requested, "*Swanwick [LJAO] can you ask him if they can descend 2-0-0 because I think they are returning to..E-B-B-L*". LJAO SE TAC then confirmed with the lead F16 pilot that this was indeed their destination and advised BELGA RADAR that descent to this level would be difficult - "*..okay I'm going to struggle to get them down but I'll do my best*". A further landline discussion took place over other conflicting traffic and it was agreed that standing co-ordination would be applied. A call was then made to TC East where standing co-ordination was again agreed on the descending F16s, LJAO SE TAC stating at 1206:48, "*Flight Level 2 Hundred so I'm going to take, if you're happy, a thousand feet [above] on all your London inbound, your Gatwicks, your Heathrows..and I'll avoid all the over-flights if you're happy with that?*". TC East responded at 1207:00, "*that's fine*". At 1207:13, LJAO SE TAC transmitted to the F16 pair, "[F16 C/S] *..because of your destination..BELGA have requested you at Flight Level 2 Hundred. It will be a stepped descent..due to civil traffic inbound London descend flight level 2-5-0*". The F16 leader acknowledged this and then LJAO SE TAC transmitted, "[F16 C/S] *correction to my last stop descent Flight Level 3 Hundred*", which was acknowledged at 1207:58. At 1209:10, LJAO SE TAC instructed the F16 pair to "*..turn left direct KOKSI*", which was acknowledged before LJAO SE TAC then transmitted about 1min later at 1210:13, "[F16 C/S] *turn right 20 degrees*". This is acknowledged at 1210:17, "*For [F16 C/S] right 20 degrees heading 130*". At 1210:28, LJAO SE TAC transmitted [incorrectly], "[F16 C/S] *descend **FL170** expedite*" which was acknowledged, "[F16 C/S] *1-7-0..*", however, LJAO SE TAC had input **FL270** into the electronic flight progress strip system. At 1211:16, LJAO SE TAC transmitted, "[F16 C/S] *confirm you are levelling at **FL270***". The F16s responded at 1211:21, "[F16 C/S] *climbing back to 270 confirm*" to which LJAO SE TAC responded, "*Affirm*", whereupon the F16 leader reaffirmed "*Copied that climbing 270*". Some 3 sec later LJAO SE TAC controller transmitted at 1211:29, "[F16 C/S] *negative, now descend **FL200***", which was acknowledged. At 1211:34, SE TAC contacted the LJAO Supervisor "*I've just had a level bust and it's got incredibly close to civil traffic can you come down?*" The handover of the F16 pair to BELGA RADAR was then completed without further incident.

An extremely thorough investigation by the unit, assisted by NATS Ltd, concluded that the LJAO SE TAC controller having accepted the lower level requested by BELGA RADAR descended the F16s into conflict with the A321. It is likely that having entered the intended level of FL270 into the electronic flight strip system that the controller had intended to transmit that level. This cognitive error, coupled with SE TAC's distraction away from the radar display by the Sector 13/14 controllers within the Ops Room, contributed to the incident.

UKAB Note (1): Analysis of the LATCC (Mil) radar recording revealed that whilst the descent of the F16s was not captured by some long range radar heads it was evident on both the Heathrow 23cm and Stansted 10cm sources. Whilst not applicable for use by the controllers involved here, they both benefit from a faster data update rate and do illustrate the vertical geometry of this encounter. Horizontal separation of 4-8nm is evident between the A321 and F16 (A) – which is presumed to be the F16 formation leader squawking the assigned code - at 1210:56, as the A321 is shown descending through FL246. The airliner is some 2600ft below F16 (A) at this point, that itself is indicating a descent through FL272 just after it had crossed ahead of the A321 obliquely from R - L. F16 (B) is shown as a primary only contact off the leader's starboard wing, generally just over 1nm away throughout with no Mode A or C evident. On the next sweep standard separation is still apparent with F16 (A) 1200ft above the A321, however, STCA is then triggered at low severity – White. Both ac are then shown passing the same level – FL242 – at a range of 2-2nm, before closing to the minimum observed horizontal separation of 2nm at 1211:16, whence F16 (A) has descended some 500ft below the A321 at a higher RoD. The A321 maintains a steady RoD as the range opens, however, F16 (A) reverses into a climb having bottomed-out at FL224. F16 (A) is shown climbing

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through FL236 once more – some 100ft above the A321 - at 1211:34, by which time horizontal separation of 5nm is apparent.

UKAB Note (2): The NATS Ltd Unit report, which was helpfully provided for this investigation, included an InCAS TCAS simulation based on recorded radar data. Neither F16 was TCAS equipped. The simulation indicates that at 1210:43, as the A321 descended through FL250, the crew was issued with a TA in response to the squawking lead F16 that was descending through FL292. No further alerts were revealed by the simulation during this encounter.

It should be noted that five '0' Mode-C plots from the F16 were removed between 1210:47 - 1211:12. The InCAS simulation interpolates between the radar plots to obtain 1 second cycle updates, the TCAS logic is still processed throughout this period albeit with an assumed constant altitude.

Diagnosis of the simulated ACAS logic for the A321 indicates that at 1210:51 an RA was NOT issued as the RoD of the F16s at that point – broadly 10,400ft/min - was greater than the tracking threshold of 10,000ft/min. The RoD was greater than 10,000ft/min until 1211:00. From then on an RA was not issued due to the 'Miss Distance Filter' (MDF), which continued to suppress the RA until 1211:16.

The NATS report concluded that that the F16s RoD was such that the TCAS RA function was inhibited – the equipment could not produce an RA in this 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 and a TCAS simulation, reports from the air traffic controllers involved and reports from the appropriate ATC and operating authorities.

It was evident from Mil ACC's report that the F16 leader had elected to exit UK airspace at a higher level (FL370) than that stipulated in the ACN, FL190. LJAO SE TAC had already pre-noted FL190 to TC E in anticipation of the lead F16 pilot's call. Indeed, when the leader first contacted LJAO SE TAC for the IFR 'radar pick-up' the F16 pair was already at that level. Area controller Members opined that, while it was feasible to deviate from the ACN, it was very unwise because the relevant levels had been specifically agreed, coordinated and promulgated to facilitate safe and efficient handling of OAT flights, here through one of the busiest and most complicated airways structures in Europe. It appeared that LJAO SE TAC's request for confirmation that the F16's still intended to transit at FL190 had been interpreted by the lead pilot, perhaps unsurprisingly, as an invitation to request an alternative level; he requested FL370. Here then was the catalyst to this Airprox. CAT pilot Members agreed that, while LJAO SE TAC did not know that the F16s would need to be at FL200 for handover to BELGA at that stage, it was in endeavouring to be helpful and acceding to the request for FL370 that the controller set the scene for a very complicated task; if SE TAC had used the promulgated levels agreed in the ACN this would likely have forestalled this Airprox. A CAT pilot Member wished to emphasise that observance of agreed co-ordination measures should be the norm. It was clear to controller Members that when BELGA RADAR said they could not accept the flight at FL370, there was no other option than to descend the F16s to FL200 in accord with BELGA's instructions. What should have been a straightforward transit of UK airspace, now necessitated LJAO SE TAC having to thread the F16 pair down through the numerous London inbounds under the control of TC E Sector and other transit traffic under the control of LACC Clacton Sector – not an insignificant task and plainly recognised as such by the controller at the time.

In descending the F16s to FL200, the onus was entirely on LJAO SE TAC to avoid other GAT by 5nm in plan, or by taking 1000ft Mode C vertical separation. A highly experienced Area controller Member recognised that the string of control instructions issued by LJAO SE TAC, vectoring the F16s whilst effecting the stepped descent eventually resulted in the prime causal error whereby the formation was instructed at 1210:28, to "*descend FL170 expedite*". This was correctly acknowledged, "[F16 C/S] 1-7-0..". At the same time LJAO SE TAC input FL270 into the electronic flight progress strip system - reflecting the controller's actual intent to descend the pair only to FL270 - it was unfortunate that an opportunity was missed to correct this error when the lead pilot read back, correctly, the level he had been given. Perhaps the requirement to input levels and transmit at the same time – talk as well as type - had been the cause here of transmitting 1-7-0 instead of 2-7-0 but, for whatever reason, it was clear from the comprehensive accounts provided that the controller had not intended to transmit FL170. Moreover, controller Members highlighted the use of the RT phraseology "*expedite*" by LJAO SE TAC. It is not

known whether the F16 pilots were aware of the limitation in UK CAS restricting RoC/RoD to 8000ft/min but, in complying with the instruction to expedite their decent, they did exceed 8000ft/min. This is in contravention to Mil AIP Vol 1, which stipulates that in CAS the instruction to expedite a climb or descent does not over-ride the limit of 8000ft/min unless the instruction includes the phrase “no restriction”. Without the addition of this phrase, an expeditious climb or descent should be at the ac’s ‘best rate’ up to 8000ft/min. The F16s’ descent at a rate exceeding 8000ft/min had the unwelcome effect of rendering both STCA and the A321’s TCAS blind to their level (as shown in the TCAS simulation). During the critical period of the F16s’ descent towards the A321, the distraction within the Ops Room from the Clacton Sector diverted the LJAO SE TAC’s attention. Thus it was not until LJAO SE TAC looked back at the radar display – where the controller reported the lead F16 was indicating FL243 Mode C and about 2nm from the A321 at the same level – that it was first realised that the pair had not levelled at FL270. The Board recognised that it was plainly LJAO SE TAC’s responsibility to ensure separation between the F16 pair and all other GAT, and Members agreed that this Airprox had resulted because LJAO SE TAC descended the F16s into conflict with the A321.

In the period leading up to this occurrence, LJAO SE TAC’s coordination requests ensured that TC and Area Control colleagues were aware of the F16 flight. Moreover, Clacton Sector were plainly concerned about the fast-jets’ proximity to one of their flights. However, it was evident that the absence of displayed Mode C data from the F16s due to their high RoD had masked the true situation, not only from LJAO SE TAC, but also from the TC E and Clacton Sector controllers as well. The Board recalled a recent related UKAB Safety Observation following Airprox 2009-016, where the Board was concerned that the SSR Mode C data displayed to LATCC (Mil) was not attuned to the requirements of military controllers providing services to flights that routinely conduct high-energy manoeuvres. It was stressed that the radar analysis diagram presented to the Board did not represent what was actually displayed to the controllers at the time. In practice, the ATSI report shows that, even if the F16’s Mode C had been present, the civilian controllers would have had little time to realise from their displays that the pair was descending into conflict; only one radar update would have shown the F16s less than 1000ft above that of the A321 before the pair descended through the level of the A321, which was itself descending. While it was unlikely that the civilian controllers would have had time to react to the F16’s Mode C, had it been displayed to LJAO SE TAC, it might well have alerted that controller to the descent below the level intended and the one entered on the flight progress strip. As it was, the radar did not alert the controllers to the true situation until STCA was triggered at 1211:05.

It seemed clear that although LJAO SE TAC had been coping satisfactorily until the point at which the instruction to descend to FL170 had been issued, the events resulting from the error confused the controller who took some time to re-establish situational awareness. When it was realised what had happened it was all too late; the separation between ac was increasing. At no stage was traffic information about the A321 passed.

In the A321’s cockpit, the crew had been alerted to the presence of the F16s by a TA and, having acquired the fighters some distance away, remained in visual contact as they descended through the airliner’s level. The pilot reports that no avoiding action was taken - perhaps considering that TCAS would alert him further if need be. However, the TCAS simulation had revealed that the F16s’ high RoD had defeated the A321’s TCAS, which had probably discounted the F16 leader’s Mode C and perceived them to be maintaining a constant level above the A321. Then, after they had passed ahead, with the horizontal separation of a magnitude such that the ‘Miss Distance Filter’ came into play, any RA that might have been triggered was suppressed. It appears, therefore that the TCAS was operating correctly within its designed parameters. This is supported by the radar recording which shows that the F16 pair had crossed ahead through the A321’s 12 o’clock at a range of just under 5nm and were already 500ft below the airliner at the minimum recorded horizontal separation of about 2nm. This, coupled with the A321 crew’s visual sighting of the F16s some distance away, convinced the Members that no risk of a collision had existed.

Whilst there was no evidence here to suggest that either the controller or the F16 pilots were unaware of this issue, the Chairman voiced a concern that military controllers and aircrew might need a reminder of the negative impact that high RoC/RoD can have on safety devices such as TCAS and STCA. Moreover, the wide-ranging caveats and implications surrounding the use of the term “expedite” need to be fully understood by all concerned. As a result of this Airprox, the DARS Advisor to the Board suggested that some additional advice/publicity on this topic for military controllers/aircrew, including foreign aircrew, would be beneficial and elected to progress this through military channels.

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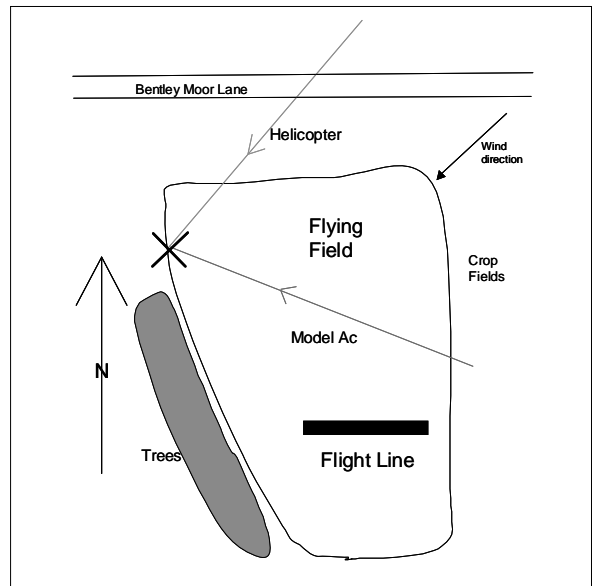
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The LJAO SE TAC controller descended the F16s into conflict with the A321.

Degree of Risk: C.

AIRPROX REPORT NO 2009-021

Date/Time: 1 Apr 1640/1730
Position: 5335N 00110W (Adwick-Le-Street Nr Doncaster)
Airspace: FIR (Class: G)
Reporting Ac Reported Ac
Type: R44 Model Ac
Operator: Civ Pte Civ Pte
Alt/FL: 400ft↑/600ft↓ (agl) (N/K)
Weather: VMC CLOC NR
Visibility: >10km NR
Reported Separation: 10ft/20ft NR
Recorded Separation: NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE R44 PILOT reports flying a local sortie from a private site VFR and not in communication with any ATSU. The visibility was >10km in VMC and the helicopter was coloured black/white; no lighting was mentioned. On departure into wind heading 040° at 60kt climbing through 400ft a model ac flew down his starboard side by 10ft; the other pilot on board said that it almost hit them. Later, on long final approach to land, heading 170° and descending through 600ft, he saw a model climbing straight at them, so he turned R and dived to 100ft out of its path, missing it by 20ft. The model flying field is 0.5nm E of his track and he had never seen models in this position before as the model was being flown into sun and downwind of the model area over the edge of a caravan park. After aborting his landing he landed at the model site to find the operator of the model, which he did. The operator said that he had not seen the R44 helicopter, which the R44 pilot thought was unlikely, as he had approached from the N, upwind. He recovered the wreck of the model ac from a nearby field and returned it to the operator, informing him the incident would be reported.

THE MODEL AC OPERATOR was contacted through the Model Flying Club by RAC Mil within 3 weeks of the incident. He was provided with a CA1094 for completion and a reminder was sent twice at 1 monthly intervals. The President of the Model Flying Club was contacted for help. He explained that since a meeting held post-event on the day by Members, including the operator concerned (X), 'X' has not returned to the club and has not renewed his membership. The President has tried to contact 'X' on several occasions but his calls have not been answered. During the post-event meeting it was stated that 'X' might have to undergo some refresher training with regard to his model flying skills; this was not well received and was possibly why he severed links with the club. The President then tried contacting 'X' through a third party just to confirm whether he was, or was not, going to complete a report. Also, a copy of the post-event meeting minutes was proffered by the President, and accepted, to show the positive action taken by the club. One week later the President reported that 'X' had told the third party that he had completed a form 5 days after being contacted by RAC Mil (<1 month post incident) and was more than happy to complete another form. Another 1094 was sent immediately (21Jul) by RAC Mil with UKAB and RAC Mil e-mail addresses. On the 10 Sep another CA1094 form was sent and the President was contacted requesting a copy of the post-event meeting minutes, which arrived 4 days later.

UKAB Note (1): The paperwork received from the President was a) Description of event, b) Photograph of helicopter parked by Flight Line and c) Schematic diagram of model field.

Model Flying Club description of event: On the field that evening were 3 members, (X) the operator with (Y) and (Z). Visibility was good with a light wind from the NE. The helicopter approached from the NE, 1 member (Z) shouted 'heli approaching'. The model was flying W to E and then turned down the downwind leg E to W. 'X' flying the model said he was not sure where the helicopter was and only saw it at the last second. The helicopter made

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a severe movement up and to the R. 'X' said he did not think the model was that close but 'Z' said it was close; 'Y' was not looking. The helicopter landed on the field very close to our Flight Line blowing the other models on the ground over. 'X' had to run for cover, losing sight of his model, which luckily crashed in a field to his R. The helicopter pilot got out, leaving his passenger in the ac, and was apparently very angry. The pilot only calmed down when 'Y' suggested calling the police. He then got back in to the heli and landed in the next field and collected the crashed model, bringing it back to our field where this time he landed away from our Flight Line. We are very aware of this helicopter; it often crossed our field 3 or 4 times in a day and we have always tried to take avoiding action. It has been a topic of conversation for some time why it was necessary for the helicopter to come so close and low but since this incident this practice has stopped.

UKAB Note (2): UKAB Secretariat contacted the President as no mention was made in the club report of the reported encounter by the R44 pilot on departure. The President said that no close encounter had been mentioned by the members for that earlier incident. The club had been in existence since 1994 and the helicopter operations had started about 18 months before the incident. The helipad was about 0.25nm W of the flying field and after the helicopter started flying operations this was highlighted immediately to members at their club meetings. The helicopter regularly flew low making it difficult for members to operate. The model flown on the day was about 5ft wingspan and 1m in length and when member 'Z' shouted the warning, 'X' turned his model the wrong way and it got very close, <100ft.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilot of the R44 and the Model Flying Club.

Members noted that the R44 pilot had reported 2 incidents but the Model Flying Club members present on the flying field at the time had not acknowledged that an incident had occurred during the R44's departure. Whether the model flyers had thought that there had been a 'close call' as the helicopter departed or not was unknown but Members agreed that there was not enough information to assess this first incident; consequently they would concentrate on the R44 pilot's encounter during his arrival phase. Members were clear that both the R44 and Model Flying Club had equal responsibility to avoid a collision with neither party having any priority over the other. The President had stated that the model flyers had found it difficult to operate owing to the helicopters flight path to and from its landing site. Although the Model Flying Club had highlighted the helicopter operations to all club members, Board Members opined that 'best practice' would have been for both parties to have come to an agreement as soon as it became apparent that both aerial activities impacted on each other's operations. The R44 pilot had reported being aware of the model flying field but thought that at the time of the Airprox the model being flown was downwind of the site. Board Members opined that this should not have come as a surprise to the R44 pilot as it is not an unusual situation; models are not confined to the airspace immediately overhead the flying site. Members believed that the R44 pilot, aware of the flying site's position and that it was active, should have avoided the flying field by a wider margin during his recovery, particularly as his downwind approach would have required further manoeuvring at a later stage to land into wind. In the absence of a report from the model ac operator 'X', from the information proffered by the Model Flying Club, it would appear that 'X' was probably busy concentrating his attention on his model to the detriment of his external situational awareness, leading to him to manoeuvre his model unintentionally towards the R44, when its presence was announced by Club member 'Y' at a very late stage. The R44 pilot had understandably only seen the model ac at a late stage, owing to its size, and had manoeuvred his helicopter to the best of his ability to avoid the model. Taking all of these elements into account the Board agreed that this incident could have been avoided had steps been taken by both parties at an early stage, and on the day, to deconflict their flying operations. As it was, the actions taken by both the model ac operator and R44 pilot had led to a conflict over the model flying field and this had caused the Airprox.

Turning to risk, on the limited information available, the Board believed that, although the R44 pilot had seen the model very late, his robust action had prevented a collision; however, the ac passed in such close proximity that safety had not been assured.

Post Meeting Note. After receiving the Board's report, the R44 pilot reiterated that his recollections of the incident were fundamentally different than those of the Model Flying Club as he had not flown over the model flying site at all, the Airprox occurring downwind of the site. In the absence of radar recordings, it was not possible to verify the actual ground track of the R44 or the model ac.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in the vicinity of a model aircraft flying field.

Degree of Risk: B.

AIRPROX REPORT No 2009-022

AIRPROX REPORT NO 2009-022

Date/Time: 3 April 1239

Position: 5120N 00139W (10.5nm NNE
Boscombe Down - elev 407ft)

Airspace: London FIR (Class: G)

Reporting Ac Reporting Ac

Type: Bell 212 Tornado GR4

Operator: HQ ACC MOD ATEC

Alt/FL: 2000ft 2000ft

(RPS 1012mb) (QFE 1003mb)

Weather VMC Haze VMC CLOC

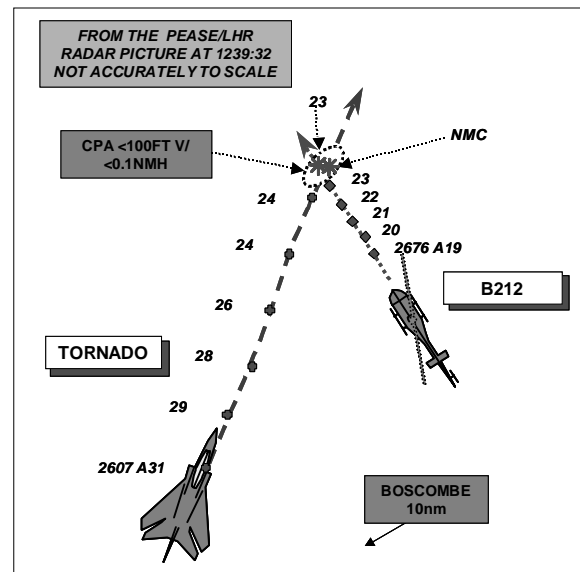
Visibility: 10km 6km

Reported Separation:

0 V/50m H 20ft V/20m H

Recorded Separation:

<100ft V/<0.1nm H (See Note (1))



BOTH PILOTS FILED

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BELL 212 PILOT reports flying a local training flight from Middle Wallop in a camouflage grey/ green helicopter with all lights on, listening out on the low flying frequency but not in receipt of an ATC service and squawking 2676 (Middle Wallop conspicuity) with Mode C. They were in transit to the Salisbury Plain Training area at 2000ft and heading 340° at 90kt when a grey Tornado ac was seen 150m away from co-pilots seat (LHS) approaching from their 8 o'clock position at the same alt. The ac passed in front of them and was seen to be evading them by banking left across their flightpath inside 50m (approx). They did not have time to take any avoiding action but reported the incident to Boscombe Down over the radio, assessing the risk as being very high.

THE TORNADO GR4 PILOT reports flying a simulated swept wing approach at Boscombe Down in a grey ac with all lights on, in receipt of a Traffic Service from DIR and being vectored outbound from the airfield in the radar pattern, heading 030° at 325kt and 2000ft QFE. DIR called traffic as '12 o'clock, 2 miles, crossing right to left, 500ft low'. He looked to the right (looking up from simulated IF) to see the ac inside very close (inside ½nm) on their RHS, heading towards them and effectively co-alt. Although he responded with aft stick input, ac response was negligible and the helicopter went behind them. He then told ATC of the close aboard with the traffic and asked its height, to be told that it was indicating 50ft low. He reported the incident over the radio and assessed the risk as being high.

UKAB Note (1): Several radars show the incident. All show the ac converging, the B212 tracking 340° in a shallow climb with the Tornado in a shallow descent closing with the B212 on a heading of 030° from its rear left with a significant overtake. The helicopter was in the Tornado's 12.30 position and below it but climbing, so would not have been visible from the rear seat, particularly in the very nose high attitude adopted when the ac is conducting a swept wing approach, until just before the CPA if at all. Despite that the incident can be seen on several radars almost all lose Mode C data to some extent at or just before the CPA. Although the ac cross between sweeps by projection they are less than 0.1nm apart.

UKAB Note (2): Reports were submitted by the Boscombe Down ATC Supervisor, DIR and SATCO. These reports are not repeated here as the significant sections are captured in the MIL ACC report below.

MIL ACC reports that at 1239Z the Boscombe Down Director (DIR) was controlling a single Tornado GR4 in the Radar Circuit for RW23 under a Traffic Service (TS) and it was downwind for a swept wing PAR. Meanwhile a Bell 212 helicopter was transiting to a training area on Salisbury Plain and not in receipt of an ATS.

The GR4 had been handed to DIR from Boscombe APP, level at 3000ft on the Boscombe QFE of 1003mb. A small turn was given at 1238:00 as a downwind track adjustment (having already avoided the Boscombe Down overhead and the Netheravon ATZ which was active with parachuting up to 13000ft). The pilot acknowledged the turn and this was followed at 1238:19 [1min 13sec before the CPA] by TI on the conflicting B212, *'C/S traffic NE 5 miles tracking NW indicating 2000 feet below believed to be a Wallop rotary'*. (At this point the radar timings are approximately 8sec behind the tape transcript). The Pease Pottage radar recording shows the B212 climbing into cover on a NW track. On first contact [at 1238.01 on the Clee Hill recording and 1238:29 on the Pease Pottage recording] the B212 is exactly 2000ft below the GR4 [but climbing slowly]. However, it is reasonable to assume that the Boscombe Down Watchman Radar would have shown the B212 slightly earlier. The GR4 pilot acknowledged the TI and 10sec later was instructed to descend to the standard pattern height of 2000ft QFE. The pilot acknowledged this and at 1238:53 he was further instructed, *'C/S limited cockpit checks report complete'*. At 1239:05 the TI regarding the B212 was updated, *'C/S previously called traffic now 12 o'clock 2 miles crossing right left indicating 500 feet below'*. The time from the first TI to the update was 46sec and during that time it can be expected that the pilot was head in the cockpit initiating the descent, levelling the ac and completing the limited cockpit checks since his response to the second TI at 1239:10 was, *'Looking C/S, and level 2000 feet limited checks complete'*. This was followed at 1239:23 by, *'And C/S, er yeah just check the er, altitude of that helicopter we just nearly got close to?'* and Dir responded, *'C/S it's now climbed indicating 1900 feet on QFE'*. The GR4 pilot acknowledged before transmitting at 1239:42, *'And, er, we had a bit of a close aboard with that, he's probably about 100 feet, er, beneath us, he's, er less than half a mile away'*.

The remainder of the instrument recovery was without incident.

The B212 pilot reported an Airprox on the Boscombe Down quiet frequency at 1243:22 and was heard to be initially quite shaken. Towards the end of the report the B212 pilot makes a valid observation having been asked if he still required to progress the Airprox further at 1246:52 he transmitted, *'Er affirm, I think, er, the difference between being on a low flying common frequency and Middle Wallop allocating us a procedures, er needs to be addressed'*.

In the investigation SATCO acknowledged that the TI passed by the DIR could have misled the pilot as to the profile of the conflicting traffic. When an ac is on a steady heading, TI should be passed using the clock code and not as a cardinal heading. In addition the trend of the conflicting traffic should also be included in both lateral (right to left) and elevation (climbing, level or descending). In this incident this was not the case: although the second TI passed by DIR used the clock code it still omitted any reference to climbing. When directing traffic in a Radar Training Circuit (RTC) a director uses set points to have the ac at the correct pattern height and correctly configured for the final approach. The RTC at Boscombe Down for both RWs is complicated by restricted airspace to the N and S of the MATZ. Several low-level helicopter routes and the relative positions of Netheravon and Middle Wallop further complicate the airspace. This, and the extended swept wing profile of the instrument recovery being flown, may have contributed to the incident.

SATCO also noted that in requesting a Traffic Service the pilot of the GR4 accepted that he would only be provided with TI and not de-confliction advice. The introduction of the new ATSOCAS in the military has been accompanied by extensive training, both for aircrew and air traffic controllers, on the boundaries of the contract made between both parties. It is, however, accepted that under a duty of care a controller still has an obligation to provide a safe service. The wording of CAP774 places great emphasis on the pilot's responsibility to avoid collision: however, calling traffic may not always be enough and controllers should always take into account the activity of the ac, the proximity of the conflicting traffic, the complexity of what the pilots may be doing at the time and the likelihood that they will be able to visually acquire the conflicting traffic in sufficient time to resolve any confliction. Although correctly calling traffic fulfils the requirements of a Traffic Service, simply calling traffic does not necessarily or always fulfil a controller's duty of care. Controllers should be prepared to interrogate pilots to ascertain if they are visual with conflicting traffic and where a risk of collision is present, ask if they require de-confliction advice. This has been highlighted in an internal standards bulletin at Boscombe Down.

MOD FTR did not comment.

HQ ACC comments that both ac were operating entirely appropriately. The Bell 212 pilot, whilst not required to talk to Middle Wallop APP or Boscombe Zone, might have been wise to, given the altitude at which he was transiting. Equally, the Boscombe DIR, knowing the altitude of the Bell 212, could have positioned the Tornado at a non-standard height to deconflict it from the helicopter.

AIRPROX REPORT No 2009-022

A very late sighting by both crews gave little or no opportunity to take any avoiding action.

Local communications procedures around the CMATZ – despite the ATSOCAS regulations – for military ac may need to be reviewed, to avoid future incidents of this nature.

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 AAC Member informed the Board that the Bell 212 was being flown by a very experienced pilot, a flight standards officer, who was sufficiently shaken by the incident not to fly for a few days afterwards. Notwithstanding his considerable knowledge of ops under the new ATSOCAS procedures, the Bell 212 pilot assumed that ac operating in the Boscombe Down radar pattern would be deconflicted by ATC from other traffic.

As identified in the MIL ACC report, the area around Boscombe Down, Salisbury Plain and Middle Wallop is complex and congested with often-conflicting operational requirements. The Board noted comments made by the Low Flying Advisor that this is a well known problem and consultation involving users of that area is ongoing to review deconfliction and communication procedures in the lower airspace.

Members noted that the Bell 212's slowly climbing flightpath was steady and predictable albeit the level off altitude was not known to anyone involved other than its pilot. There was unanimous agreement among both pilot and controller Members that listening out on the low-level common frequency was not going to provide the helicopter pilot with any meaningful information; Boscombe Zone would however have been able to provide the Bell 212's pilot with useful information on the local traffic picture through the 'choke point' even at his relatively low altitude.

There was considerable discussion regarding the handling of, and restricted lookout from, the Tornado while conducting swept wing approaches. Tornados are based at Boscombe Down and swept wing approach training is conducted there reasonably frequently. That being the case Military Controller Members assured the Board that Boscombe controllers should be aware of the non-standard pattern; the ac handling constraints and that when flying such patterns pilots are effectively flying under IFR with restricted opportunity to lookout and limited ability to manoeuvre. The Board was reassured by two Tornado pilot Members that practicing this type of approach is both necessary and perfectly safe: it is simply that the ac handles differently and the pattern is flown at higher speed; at a higher AoA both downwind and on the approach itself and the pattern is slightly bigger than normal. Therefore the exercise requires more attention both from pilots and controllers. Members also noted that in common with most Military instrument patterns part of the Boscombe Down radar pattern is outside the MATZ.

There was also much discussion regarding the provision of an ATS in instrument patterns at military airfields without the benefit of CAS around them. Ac operating in the instrument pattern (although technically only while within the MATZ) are effectively under mandatory heading and height instructions from ATC. However, military pilots frequently operate in receipt of a TS (formerly under a RIS) since to operate under a Deconfliction Service would be impracticable due to the density of unknown/non-participating traffic that would need to be avoided, thus taking participating ac well away from the desired instrument pattern. When under a TS the pilot is wholly responsible for visual collision avoidance and it appeared to some Members that following mandatory heading and height instructions and also conducting visual avoidance, possibly when IFR, are incompatible. However, an experienced Military Controller Member opined that notwithstanding the level of service being provided, 'good controllership' and best practice dictated that controllers should not place ac on conflicting courses at similar altitudes. There was general agreement among controller Members that the Boscombe DIR, not knowing the intentions of the Bell 212 or the ATC unit that it was working, should have attempted to vector the Tornado round it since with the limited information available to him, alt deconfliction was not practicable. It was accepted that this might have meant that the (swept) approach was discontinued and the Tornado repositioned later.

A pilot Member noted that in this incident, despite the Tornado pilot being in receipt of a TS, when looked at simplistically the controller had vectored (laterally and vertically) the Tornado very close to the helicopter: the Member considered that this was the prime cause of the incident. This analysis, although not presenting the complete picture, was agreed unanimously by the Board. Nevertheless, it was noted that, despite the apparent contradictions, under a TS pilots also have a responsibility to 'see and avoid' other traffic while operating in Class

G airspace: the Tornado pilot had not done so until his ac was about ½nm away from the helicopter. He had been provided with TI twice and on both occasions the information given had been accurate, although incomplete in that in both instances no mention was made that the helicopter was climbing towards his ac as he descended to 2000ft as instructed. If the Tornado was in a poor configuration to manoeuvre rapidly, its pilot could have brought the wings forward fairly quickly allowing him to manoeuvre more aggressively. The Board therefore considered that this late sighting had contributed to the incident by decreasing the separation between the ac.

When assessing the risk Members noted that the Tornado had not manoeuvred sufficiently to increase the separation significantly and that the helicopter pilot (seated on the opposite side of the ac from the overtaking Tornado) was not able to see it until too late to take any avoidance. That being the case Members agreed unanimously that it was fortunate that there had been a few feet (less than 100) of vertical separation between the ac. Further, the radar recording confirmed both pilots view that the horizontal separation had been minimal. The Board was therefore unanimous that in this most serious incident there had been an actual risk of collision.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Boscombe Down DIR vectored the Tornado into conflict with the Bell 212.

Degree of Risk: A.

Contributory Factor: A late sighting by the Tornado crew.

AIRPROX REPORT No 2009-023

AIRPROX REPORT NO 2009-023

Date/Time: 1 Apr 1542

Position: 5135N 00346W (1nm SE Port Talbot)

Airspace: FIR (Class: G)

Reporting Ac Reported Ac

Type: EC135 BE23

Operator: Civ Comm Civ Pte

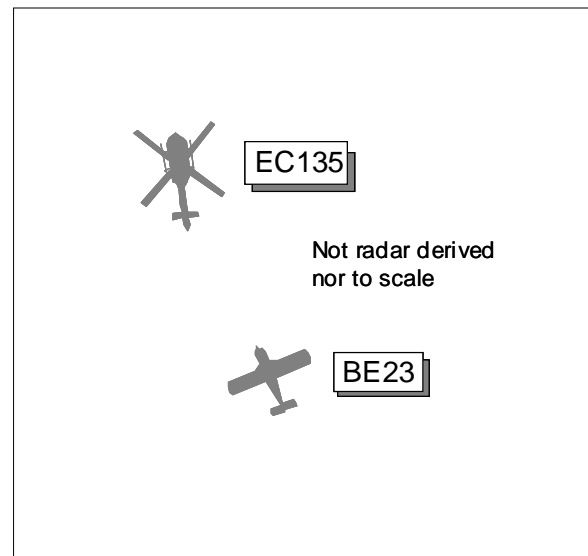
Alt/FL: 1200ft 1000ft↑
(QNH) (QNH 1021mb)

Weather VMC CLBC VMC CLBC

Visibility: 10km 27km

Reported Separation:
100ft V 200ft V/200m H

Recorded Separation:
NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE EC135 PILOT reports flying a local sortie from St Athan VFR and in receipt of a Basic Service (BS) from Cardiff on 126-625MHz squawking a discrete code with Mode C. The visibility was 10km flying 2000ft below cloud in VMC and the helicopter was coloured dark blue/yellow with nav and strobe lights switched on. Whilst flying on a slow constant heading of 340° conducting a search along a ridge line near Port Talbot at 30kt and 1200ft amsl QNH 1021mb (1000ft agl), a small white ac suddenly appeared 50-100ft under the helicopter's nose from his 6 o'clock to 12 o'clock heading away. The ac was then seen to climb to the same height. A TCAS TA was received but only when the other ac, later identified by ATC as a BE23, was forward of their nose. He did not assess the risk, only stating that the other ac missed them but he wondered at what stage did the other pilot see their helicopter.

THE BE23 PILOT reports en-route VFR from Cardiff intending to land at Swansea and in receipt of a BS from Cardiff 126-625MHz squawking with Mode C. The visibility was 27km flying 3000ft below cloud in VMC and the ac was coloured white/blue with strobe lights switched on. He departed Cardiff for GH en-route to Swansea, leaving CAS 'not above 1500ft' in the area of Junction 36 of the M4. He was not advised of the presence of any other ac. About 3nm E of Port Talbot he practiced a precautionary cct of Old Park Farm airstrip which he had used before. He departed the cct following the M4 W'bound with the steelworks on his L and high ground on his R. Heading 330° at 85kt he was climbing gently and maintaining a good lookout: the sky was completely overcast but visibility was good. He pointed out to his passenger a helicopter above their ac and some distance ahead, about 1000m away, travelling from L to R. He steadied his climb passing 1000ft QNH 1021mb and observed the helicopter closely, it turned sharply R and overflew them from R to L 200ft above and 200m ahead as if the pilot was having a look at them. He monitored its movements throughout and saw no need to take avoiding action. As the helicopter passed O/H its pilot spoke to Cardiff and asked for his ac's details, stating he wanted to see his ac's registration and wanting to follow him. As he was listening out, he immediately responded that he had had the helicopter fully in sight at all times and watched as the helicopter turned towards his ac. He could not continue his climb until the helicopter had left his vicinity and he had no intention of overflying the active steelworks to his L or turning to the R, judging this unsafe because of the high ground. Whilst monitoring the helicopter he saw no reason to take any unusual or avoiding action at all. He subsequently carried on climbing and carried out further GH in Swansea Bay before returning to Cardiff having decided not to land at Swansea. He assessed the risk as low.

THE CARDIFF RADAR 2 reports providing a BS to several ac in the Porthcawl and Port Talbot areas. At various stages during the session he was busy with high workload including IFR vectoring and ATSOCAS. At approximately 1540 he noticed a radar return from a Grob Tutor that was identified becoming intermittent suggesting that it was possibly low level. As it was in the vicinity of the subject EC135, whose radar return was also intermittent but at times indicated 1000-1200ft, he believed there to be a possible risk of collision between

these 2 ac so gave TI to the EC135 pilot and asked the Grob pilot to report his level. It became apparent that the Grob had climbed and so no longer presented a collision risk. Two minutes later the EC135 pilot advised him that an ac had passed just under him by 100ft and, as the pilot said this, he observed an SSR return from the subject BE23 appearing just NW of the EC135. He had not observed the BE23 in the EC135's vicinity until then. The EC135 pilot stated he was unhappy and was considering his actions. He later spoke to both pilots and entered details in the Watch Log.

ATSI reports that the BE23 flight, outbound from Cardiff to Swansea, established communication with Cardiff Approach at 1533. The pilot was requested to squawk 'ident', to report his level (1100ft) and was informed a Basic Service (BS) outside CAS was being provided. The pilot read back the service.

The EC135 pilot, airborne from St Athan, contacted Cardiff Approach at 1535, reporting outbound to the Port Talbot area and requesting a BS. The service was agreed and read back by the pilot. Port Talbot is approximately 21nm NW of Cardiff Airport. About 3min later the EC135 flight was issued with TI about a Grob Tutor aircraft which was also on the frequency. The EC135 pilot reported visual with it.

At 1542:18, the pilot of the EC135 contacted the frequency, reporting *"...I just had a light aircraft fly underneath me about ????? one hundred feet I'm just gonna try get his registration flying north towards Swansea"*. The controller responded *"I think it's probably working me I've lost him on radar it's BE23 c/s who's just in the Port Talbot area"*. The BE23 pilot transmitted *"BE23 c/s I saw that I wanted to pass underneath him er it was not there was not sufficient time to climb over him because of his position BE23 c/s"*.

Local ATC investigation reveals, after viewing radar replays of the local radar and Clee Hill, that immediately prior to the Airprox neither of the subject ac were showing on the radar recording. The MATS Part 1, Section 1, Chapter 11, Page 4, (also CAP774, Chapter 2) states the conditions for a Basic Service. Of relevance to this Airprox: *'A Basic Service is an ATS provided for the purpose of giving advice and information useful for the safe and efficient conduct of flights.....Basic Service relies on the pilot avoiding other traffic, unaided by controllers. It is essential that a pilot receiving this service remains alert to the fact that, unlike a Traffic Service and a Deconfliction Service, the provider of a Basic Service is not required to monitor the flight.....Pilots should not expect any form of traffic information from a controller, as there is no such obligation placed on the controller under a Basic Service outside an ATZ, and the pilot remains responsible for collision avoidance at all times'*.

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

UKAB Note (2): The Rules of the Air Regulations 2007 Rule 8 Avoiding Aerial Collisions states: *"(1) Notwithstanding that a flight is being made with an air traffic control clearance it shall remain the duty of the commander of an aircraft to take all possible measures to ensure that his aircraft does not collide with any other aircraft. (2) An aircraft shall not be flown in such proximity to other aircraft as to create a danger of collision. (3) Subject to sub-paragraph (7), aircraft shall not fly in formation unless the commanders of the aircraft have agreed to do so. (4) An aircraft which is obliged by this Section to give way to another aircraft shall avoid passing over or under the other aircraft, or crossing ahead of it, unless well clear of it. (5) Subject to sub-paragraph (7), an aircraft which has right-of-way under this rule shall maintain its course and speed. (7) Sub-paragraphs (3) and (5) shall not apply to an aircraft flying under and in accordance with the terms of a police air operator's certificate"*.

Rule 9 Converging states: *"(3) ...when two aircraft are converging in the air at approximately the same altitude, each shall alter its course to the right"*. Rule 10 Approaching head-on states; *"When two aircraft are approaching head-on, or approximately so, in the air and there is a danger of collision, each shall alter course to the right"*. Rule 11 Overtaking states: *(1) ...an aircraft which is being overtaken in the air shall have the right-of-way and the overtaking aircraft, whether climbing, descending or in horizontal flight, shall keep out of the way of the other aircraft by altering course to the right". (2) An aircraft which is overtaking another aircraft shall keep out of the way of the other aircraft until that other aircraft has been passed and is clear, notwithstanding any change in the relative positions of the two aircraft"*.

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.

AIRPROX REPORT No 2009-023

As this encounter had occurred in Class G airspace, both crews were responsible for maintaining their own separation from other ac through 'see and avoid'. The EC135 pilot had been approached from behind and was surprised by the sudden appearance of the BE23 whose pilot had seen the helicopter about 1000m ahead in slow flight. The BE23 pilot monitored the EC135's flightpath and, owing to adjacent high ground and built-up area, elected to fly under the helicopter by 200ft whilst maintaining visual contact with it. In doing so, the BE23 pilot flew close enough to the EC135 to cause its pilot concern and this had caused the Airprox. However, the early visual acquisition and action taken by the BE23 were enough to allow the Board to conclude that any risk of collision had been effectively removed.

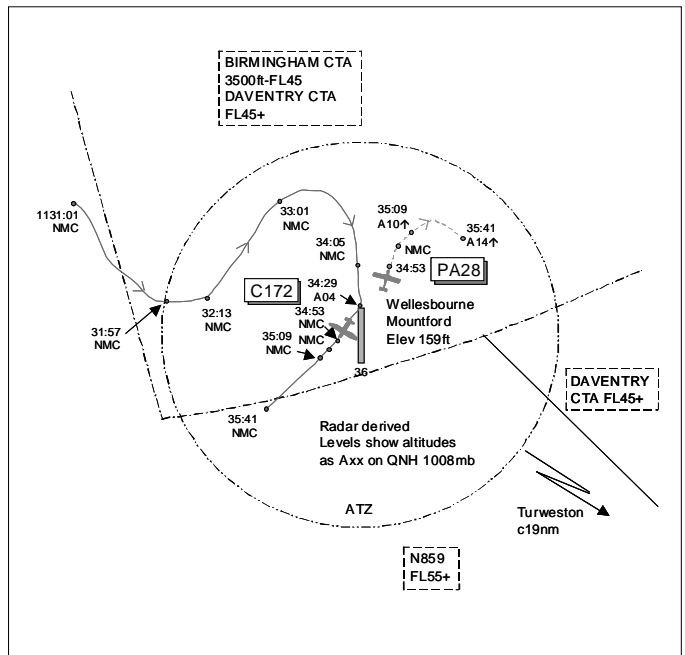
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The BE23 pilot flew close enough to the EC135 to cause its pilot concern.

Degree of Risk: C.

AIRPROX REPORT NO 2009-025

Date/Time: 11 Apr 1135 (Saturday)
Position: 5212N 00137W (O/H Wellesbourne - elev 159ft)
Airspace: ATZ (Class: G)
Reporter: Wellesbourne AFISO
1st Ac 2nd Ac
Type: PA28 C172
Operator: Civ Club Civ Pte
Alt/FL: 250ft↑ (a) (NK)
Weather VMC CLBC NK
Visibility: >10km NK
Reported Separation:
 AFISO 160ft
 100ft V/NR H NR
Recorded Separation:
 NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE WELLESBOURNE AFISO reports that the RW in use was 36 LH cct. The departing subject PA28 had just lifted-off about 600m along the RW when another ac was seen, later identified as the subject C172, having passed the RW18 threshold flying in the opposite direction at about 200ft; this flight was not in RT contact. The PA28 pilot was instructed to make an immediate R turn and the ac passed within 160ft of each other. The C172 was seen to make a climbing R turn out of the cct and then depart to the SE. Turweston telephoned later to say that the C172 had landed there and the PA28 pilot later said that the C172 was recognised at Turweston as being the conflicting ac.

THE PA28 PILOT reports departing Wellesbourne to Turweston VFR and in receipt of a BS from Wellesbourne on 124.025MHz squawking 7000 with Mode C. The visibility was >10km in VMC and the ac was coloured blue/gold with strobe lights switched on. The FISO issued departure information, at pilot's discretion, from RW36 with a R turn after becoming airborne to comply with local noise regulations. At approximately 250ft aal heading 360° at 80kt and about to execute the RH turn both the PA28 pilot and his co-pilot saw a high-wing single-engine ac on a reciprocal heading approximately 100ft above them. At this point they were instructed by the tower to 'break R' but in fact their climbing turn had just commenced. The FISO asked if they had been able to identify the other ac's registration and type but this had not been possible. Earlier they had departed Turweston intending to fly to Langar but owing to a severe deterioration in the Wx conditions en-route they had diverted to Wellesbourne. He had mentioned the incident on his return to Turweston and was advised to follow this up with a written report. He had not intended making an official complaint but he was told later that the Wellesbourne FISO had raised an Airprox. He opined that the response from the Wellesbourne FISO was excellent both during the incident and following, when he informed the FISO that owing to workload at that point in the take-off both he and his flying partner had been unable to note any details concerning the other ac.

UKAB Note (1): RAC Mil traced the C172 on radar to it's landing at Turweston from Blackpool. The ac's owner was contacted and expressed extreme embarrassment that he could not provide the pilot's contact details. Although he had examined the pilot's logbook to ensure that he had more than 1500hr as required by his insurance, he was unable to recall the pilot's full name or address. The AFISO at Wellesbourne had telephoned Turweston and requested that the pilot of the C172 contact Wellesbourne. On the insistence of the Turweston CFI the pilot rang Wellesbourne but the surname recorded by the AFISO is that of the ac owner. The owner stated that he had been a rear seat passenger in the ac but had not been wearing a headset; subsequently he had been in an adjoining office paying for fuel when the pilot made his telephone call to Wellesbourne and had not overheard

AIRPROX REPORT No 2009-025

the conversation. The Turweston CFI later checked the aerodrome 'booking in/out sheet' but there was no record of the ac's movement. The Blackpool 'booking out' system had captured the C172's movement but the electronic database did not log the pilot's name.

UKAB Note (2): Met Office archive data provided METARS for Birmingham (16nm to the N) and Brize Norton (27nm to the S). EGBB 111120Z VRB02KT CAVOK 10/05 Q1008= and EGVN 111150Z 34004KT 9999 FEW030 SCT045 BKN090 11/04 Q1009 BLU NOSIG=

UKAB Note (3): The UK AIP at AD 2-EGBW-1-3 Para 2.17 promulgates Wellesbourne Mountford ATZ as a circle radius 2nm centred on the longest notified RW (18/36) 521132N 0013652W SFC-2000ft aal, aerodrome elevation 159ft. Para 2.21 Noise Abatement Procedures states a) *Runway 36 departures: After departure turn right onto track of 030° to 1000ft QFE before turning crosswind.* b) *Do not overfly Loxley (1.5nm SW) or Charlecote/Hampton Lucy (1nm N) on departure.*

UKAB Note (4): The Rules of the Air Regulations 2007 Rule 45 Flights within ATZs states *"During the notified hours of watch of the air/ground stationthe commander shall obtain information from the air/ground communication service to enable flight to be conducted safely within the zone. The commander of an aircraft flying within the aerodrome traffic zone of an aerodrome shall a) cause a continuous watch to be maintained on the appropriate radio frequency notified for communications at the aerodrome; or b) if this is not possible, cause a watch to be kept for such instructions as may be issued by visual means; and c) if the ac is fitted with means of communication by radio with the ground, communicate his position and height to theair/ground communication service at the aerodrome on entering the zone and immediately prior to leaving it.*

UKAB Note (5): The Cleve Hill radar recording does not capture the Airprox as the departing PA28 only appears after the ac have passed, but it does show the C172's track throughout. The C172 is seen at 1131:01 squawking 7000 with NMC 3.2nm NW of Wellesbourne tracking SE. Just under 1min later at 1131:57 the C172 is seen to have commenced a L turn as it enters the ATZ before rolling out on a track of 030° 16sec later 1.6nm W of Wellesbourne. This track is maintained until 1133:01 when the C172 commences a R turn, finally rolling out onto the RW18 FAT at 1134:05. A Mode C readout of altitude 400ft is seen from the C172 at 1134:29 on short finals before the next sweep shows the C172 having executed a sharp R turn onto a SW heading and showing NMC again. The PA28 is first seen at 1134:53 as a primary only return 0.75nm NNE of Wellesbourne tracking 030° having passed the C172 which 0.25nm W of RW36/18 still tracking SW. On the next sweep the PA28 is seen squawking 7000 with NMC followed 8sec later with a Mode C readout of altitude 1000ft QNH 1008mb, by which time the PA28 has commenced a R turn eventually steadying on a SE track towards Turweston. Meanwhile the C172 continues on its SW track before eventually turning onto a SE track towards Turweston at the ATZ boundary.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included a report from the pilot of the PA28, radar video recordings, and a report from the AFISO involved.

Members were disappointed that the C172 pilot had not been traced or come forward. This had denied the Board any explanation from the C172 pilot of his actions when he had made an approach to the wrong RW at the wrong airfield without carrying out a recognisable joining procedure and not in RT contact with the Wellesbourne AFISO. It is likely that there are valuable lessons to be learnt but these have been lost without the C172 pilot's input. The AFISO was unaware of the presence of the C172 because its pilot had not called the Wellesbourne frequency prior to entering the ATZ, contrary to Rule 45 of the ANO; the Board agreed that this had been part of the cause of the incident. In the absence of a radio call or carrying out a standard O/H join, the C172 pilot did not identify the runway in use and flew against the flow of other ac in the cct before making an approach to the opposite end of the active RW. In doing so the C172 pilot had not integrated safely into the visual cct and this was the second part cause of the incident.

Members commended the actions taken by the AFISO in attempting to resolve the 'head-on' confliction, by instructing the PA28 pilot to 'break R', even though this went beyond the remit of the AFISO's authority. The PA28 pilot had seen the C172 at about the same time as the AFISO and was just commencing his 'noise abatement' R turn when the avoiding action 'instruction' was passed. The PA28 pilot had watched the C172 pass about 100ft above and clear to his L. It appeared that the C172 pilot saw the departing PA28 late, only executing a R turn to avoid it when almost at the RW18 threshold. Members agreed that the actions taken by all parties had removed

the actual risk of collision but the Board believed that separation margins had been eroded to the extent that safety had not been assured during the encounter.

PART C: ASSESSMENT OF CAUSE AND RISK

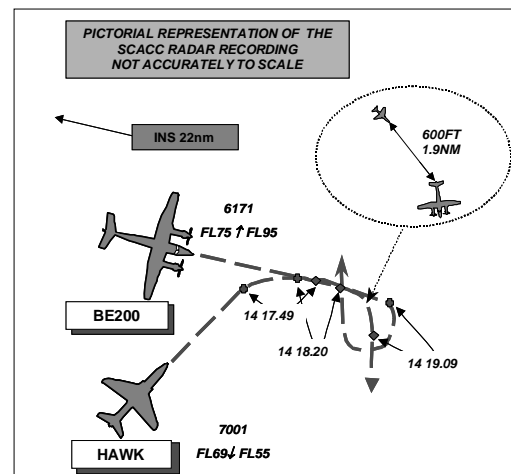
Cause: The C172 pilot did not comply with the requirements of Rule 45 of the ANO and did not integrate safely into the visual cct.

Degree of Risk: B.

AIRPROX REPORT No 2009-027

AIRPROX REPORT NO 2009-027

Date/Time: 15 April 1419
Position: 5725N 00325W (22nm SE INS)
Airspace: Scottish FIR (Class: G)
Reporting Ac Reported Ac
Type: BE200 Hawk
Operator: CAT HQ Air (Trg)
Alt/FL: FL75 5500ft
(RPS 1015mb)
Weather VMC NK VMC CLAC
Visibility: NK 10km



Reported Separation:

NK V/1.5nm H 750-1000ft V/1-1.5nm H

Recorded Separation:

600ft V/1.9nm H

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BE200 PILOT reports flying an Air Ambulance flight with one patient, under IFR from Inverness to Aberdeen and squawking as directed with Mode C. After departing Inverness they were given own navigation direct to ADN and an initial clearance of FL75. Inverness ATC warned them of closing traffic, which they identified on TCAS; ATC then gave them a heading of 180° to avoid the traffic. The other ac then turned further towards them and ATC instructed them to climb to FL95. The other ac came within 2nm of them but they could not determine the height from TCAS; the TCAS symbol then turned Amber [TA]. They believed that the other ac was a military Fast-Jet and assessed the risk as being low.

THE HAWK PILOT reports flying a dual, low level tactical training sortie from Valley to Kinloss in an ac with no TCAS fitted. The student pilot was flying and was given a simulated emergency so they climbed out from low level 7nm SSW of Kinloss, levelling at 5500ft AMSL heading E. They were listening out on Lossie APP frequency in anticipation of recovery [to Kinloss], but had not established contact and they were still squawking 7001. Lossie APP contacted them to attempt identification and inform them of civil traffic 5nm ahead on a similar track at FL65. The captain gained visual contact with a white civil ac in their 12 o'clock at an estimated range of 3nm. Shortly thereafter the civil traffic commenced a right hand turn and the student pilot [still the handling pilot] then also entered a hard right hand turn to avoid the ac, which he believed to still be on his nose. Their turn took them no closer than about 1nm behind and 750-1000ft below the civil traffic, which Lossie approach then informed them also to be in a right hand turn and under a de-confliction service from Inverness. They assessed the risk as being low.

ATSI reports that the BE200 pilot established communication with Inverness APR at 1413, reporting passing 600ft. The ac was identified on departure and the pilot was informed that a Deconfliction Service (DS) was being provided; he read back the ATC service and reported turning on to a heading of 120°. APR instructed a climb to FL75 and approximately one min later to assume own navigation to ADN.

At 1415:55, the BE200 was informed "early warning of traffic in your right half past 4 o'clock at a range of 11 miles is a military contact indicating 2200ft climbing unverified I'll keep you advised". At 1417, the TI was updated "that military contact's currently in your 5 o'clock at a range of 7 miles indicating 3500ft now descending his present track should pass behind you". Shortly afterwards, the information was again updated "that contact's just passing your 6 o'clock now at a range of 3½ miles your present track is the best avoiding action". As soon as the pilot acknowledged the information, the controller observing the unknown ac turning towards the BE200, continued "correction he's turning towards you turn right heading 180 degrees". After the pilot read back the heading he was

instructed to make an *“avoiding action climb FL95”*. About 30sec later, the controller observed the unknown ac turn behind the BE200 and informed its pilot accordingly *“those contacts seem to be following he’s still in your 6 o’clock at a range of ½ a mile and indicating FL57 now descending turn left heading 115”*.

At 1419:52, the BE200 was informed it was 18nm SE of INS, clear of the traffic and instructed to resume its own navigation to the ADN.

The MATS Part 1, Section 1, Chapter 11, states the definition of a Deconfliction Service:

‘A Deconfliction Service is a surveillance based ATS where, in addition to the provisions of a basic service, the controller provides specific surveillance derived traffic information and issues headings and/or levels aimed at achieving planned deconfliction minima, or for positioning and/or sequencing. However, the avoidance of other traffic is ultimately the pilot’s responsibility.’ Additionally: *‘A controller shall provide traffic information, accompanied with a heading and/or level aimed at achieving a planned deconfliction minima against all observed ac in: Class G airspace. The deconfliction minima against uncoordinated traffic are:*

5 NM laterally (subject to surveillance capability and CAA approval) or 3000ft vertically and, unless SSR Mode 3A indicates that the Mode C data has been verified, the surveillance returns, however presented, should not merge.

High controller workload or RTF loading may reduce the ability of the controller to pass deconfliction advice and the timeliness of such information. Furthermore, unknown ac may make unpredictable or high-energy manoeuvres. Consequently, it is recognised that controllers cannot guarantee to achieve these deconfliction minima; however, they shall apply all reasonable endeavours.’

On this occasion, the controller attempted to deconflict the BE200 from the unknown ac but was unable to achieve the deconfliction minima because of the latter’s relative routing to the BE200.

Inverness ATC made an internal recommendation and, consequently, stated an intention to liaise with AIDU: *‘Military Low level handbook to include a request for transiting military crews to establish two-way communications with Inverness’*.

MIL ACC reports that Lossiemouth ATC provides Centralised Approach Control for Kinloss where the screen controller reported the workload as low with no other traffic on frequency. At 1408:40 Inverness passed TI to Lossiemouth on BE200 routing from Inverness to Aberdeen, squawking 6171, climbing to FL075 and asking if they wished to work the traffic; this was declined. Meanwhile a 7001 squawk was seen climbing out from low level 20nm SE of Inverness and the contact was believed to be one of two Hawks from Valley inbound to Kinloss.

At 1414:19 the Lossiemouth U/T Approach Controller (APP) received a garbled transmission. At 1417:26 App tried to establish communications on frequency 234.875MHz with the radar contact now 15nm SW of Lossiemouth saying, *‘C/S1 or C/S2 Lossie Approach’*. The Hawk pilot acknowledged the call and at 1417:42 APP transmitted, *‘C/S, Approach, just confirm you are South West by about 15 miles tracking North East’*; the pilot acknowledged this at 1417.46 as, *‘Affirm, C/S’*. At the time pilot was listening out on the Lossiemouth APP frequency but not under an ATS. An admin transmission is made by APP at 1417:48, *‘Roger, squawk 37... just confirm your type of recovery to Kinloss’*. App is told to standby. At 1418:01 APP transmitted, *‘C/S, traffic believed to be you has traffic East 3 miles tracking East flight level 75 civilian’*. The Hawk replied, *‘Copied C/S looking’*. The Hawk was then instructed to squawk ident. At 1418:28 App transmitted, *‘C/S identified traffic East 2 miles Eastbound at flight level 75’*. The Hawk replied at 1418:34, *‘Traffic copied. C/S looking for radar to initials for Kinloss’*. This was followed at 1418:40 by APP, *‘C/S roger squawk 3701 what type of service’*. The Hawk replied, *‘3701, traffic’*. APP transmitted at 1418:46, *‘Traffic Service. The civilian traffic has just avoided yourself, just confirm your height on clutch QFE 1017’*. The Hawk replied, *‘1010 we’re at 6500 feet’*. APP then reiterated the QFE before transmitting at 1419:04, *‘C/S the civilian traffic is avoiding you to the South and you’ve turned to the South’*. The Hawk pilot replied at 1419:10, *‘I’m looking for that traffic and I’m at 1017, C/S’*. At 1419:13 APP transmitted, *‘Roger avoiding action turn right heading 330 degrees’*. The Hawk took the turn and was then descended iaw the recovery procedure for radar to initials at Kinloss without further incident.

The Hawk pilot was operating VFR in Class G airspace conducting an instructional sortie prior to recovery to Kinloss. The Lossiemouth APP controller was proactive in trying to prevent this incident. Having observed the 7001 squawk climbing out of low level in conflict with the BE200 he raised the Hawk on frequency and passed

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accurate and timely TI. The Hawk was also passed an avoiding action turn despite that it was in receipt of a Traffic Service (TS). However, at the time of the avoiding action turn the Hawk was already descending and the CPA of 600ft and 1.9nm (1418:42) had already occurred.

HQ AIR (TRG) comments that due recognition should go to the Lossiemouth APP controller whose proactive actions should be applauded. Timely TI was passed to both ac, appropriate avoiding action was flown and both crews assessed the risk of collision as low.

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.

The Board noted that the incident took place in Class G Airspace where both ac were operating legitimately with an equal and shared responsibility to see and avoid other traffic. The BE200 pilot had opted to use a radar service to assist with this responsibility and the Hawk had switched to the Lossie APP frequency but not yet established RT contact when the incident occurred. Notwithstanding this, the Lossie controller, having been made aware of the BE200 and its intentions by Inverness, took immediate action to identify and make contact with the Hawk, which had 'popped up' on his display, since he considered it might come into conflict with the BE200. Although it took some time to establish 2-way communication with the Hawk, Lossie APP then took positive action by quickly passing accurate TI to the crew, which enabled them to gain visual contact with the BE200. With the Hawk closing on the BE200 from behind, the Inverness controller instructed the BE200 to turn R and climb; although the Hawk also turned right shortly afterwards, apparently with its student pilot not having seen the BE200 turn, it remained below and well astern of the BE200.

When assessing the cause and degree of risk Members accepted that the BE200 pilot could not see the Hawk and was understandably concerned by his TCAS indicating an ac behind him and closing; however, they agreed unanimously that there had been no risk of a collision at any time during the incident. They also noted that both pilots assessed the risk as being low and that the Hawk captain, who was in visual contact with the BE200 throughout, ensured a minimum separation of about 2nm and 600ft.

Members were briefed regarding the internal recommendation made by Inverness ATC. The Military Low Flying Handbook already has a recommendation for all ac flying within 15nm of Inverness at Low Level to call Inverness Tower and those climbing out to call Lossie Radar. It was also noted that Lossie Radar have a land line to Inverness and routinely pass details of all Lossiemouth, Kinloss and known transit traffic that may affect them. The Board therefore, did not support the recommendation made by Inverness ATC.

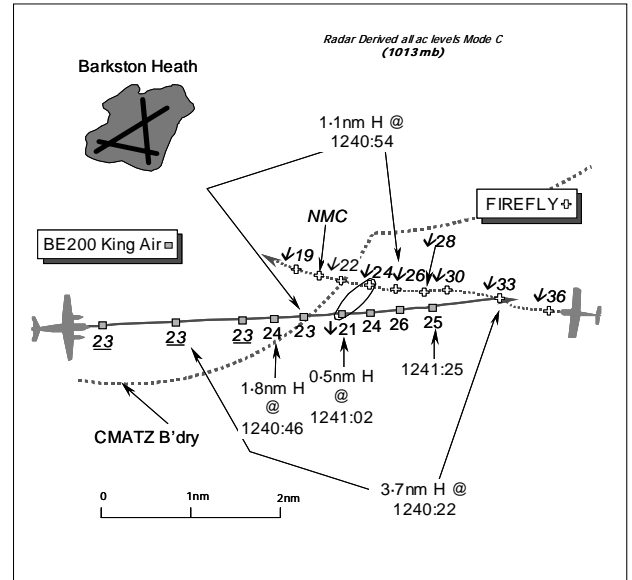
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Sighting report (TCAS).

Degree of Risk: C.

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Date/Time: 21 April 1241
Position: 5256N 00029W (6nm S Cranwell - elev 218ft)
Airspace: CMATZ/AIAA (Class: G)
Reporting Ac Reported Ac
Type: BE200 King Air Firefly
Operator: HQ Air (Trg) HQ Air (Trg)
Alt/FL: 2500ft NR
 QFE (1018mb)
Weather VMC NR VMC NR
Visibility: 8km NR
Reported Separation:
 Nil V/100-200m H NR
Recorded Separation:
 0.5nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BEECH 200 KING AIR PILOT reports that he was conducting an IFR instructional sortie from Cranwell and was in receipt of a TRAFFIC Service from Cranwell APPROACH (APP) on 280.775MHz. A squawk of A2601 was selected with Modes S & C on. TCAS is fitted.

The Airprox occurred on the DOWNWIND leg for a vectored single-engine ILS to RW27; he had been cleared to, and was level at, 2500ft Cranwell QFE (1018mb), VMC some 3000ft clear below cloud. About 5nm S abeam the aerodrome heading 090° at 160kt, TCAS “issued a warning” of an aircraft, he thought, slightly below them – about 200ft initially - but climbing on a reciprocal path from directly ahead his ac. The “warning” quickly increased to “avoidance action” with a RA to DESCEND. He complied with the DESCEND RA down to about 2200ft QFE, when the RA then changed to a CLIMB, which he then complied with to a height of about 2800ft. At this point TCAS enunciated clear of conflict whereupon a yellow Firefly was spotted for the first time in his 7 o’clock position having passed down the port side of his King Air at a range of 100-200m at a similar height. He assessed the Risk as “low”.

THE FIREFLY PILOT reports that he was conducting a VFR training flight during the period, but was not aware that the Airprox had occurred until 3 days after the occurrence when he was contacted by his Flight Safety Officer. He has no direct recollection of the event but, in his view, at no time did he get unduly close to any other ac.

At the reported Airprox time, he would have been completing a normal overhead join to Barkston Heath in VMC, in accordance with normal procedures and in communication with Cranwell APP on 280.775MHz. He would have been in receipt of a BASIC Service and squawking [A2642 was selected] with Mode C on. Neither TCAS nor Mode S is fitted. His ac has yellow upper surfaces, black undersurfaces and the HISLs were on.

THE CRANWELL APPROACH CONTROLLER (APP) reports the Cranwell and Barkston Heath APPROACH positions were bandboxed; he was controlling 2 ac in the Cranwell instrument pattern and 3 VFR recoveries inbound to Barkston Heath - all on 280.775MHz. He assessed his workload as moderate.

The BE200 had been identified and placed under a TRAFFIC Service, the crew issued appropriate traffic information and “when ready for turns” were vectored onto a heading of 140°. Further traffic information was given with a turn onto 090°. The BE200 had steadied E and further traffic information was given “traffic 12 o’clock, 3nm 1000ft above descending, Firefly”. The Firefly had switched to Barkston Heath TOWER on Stud 11, and he was in the process of handing over the operating position to the oncoming controller when the BE200 pilot at a position about 6nm SW of Cranwell reported a TCAS RA. The Airprox occurred in the upper portion of the Barkston Heath [elev: 367ft amsl] MATZ ceded to Cranwell and known as the ‘Barkston Heath Slot’.

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DAATM reports that the BE200 crew was receiving a TRAFFIC Service from Cranwell APP whilst operating in the Cranwell Radar Training Circuit (RTC) level at 2500ft QFE (1018mb). The Firefly was receiving a BASIC Service, also from APP, whilst positioning for a visual recovery to RW24RH at Barkston Heath. APP provided a positioning turn DOWNWIND in the RTC having ascertained the BE200 crew's further intentions and decision height for the ILS approach. [When asked for a weather report the BE200 pilot responded "*overhead Grantham at 2500 horizons are non existent but looks clear above*".] APP acknowledged the report and at 1239:20, advised the BE200 pilot to "*..turn left heading 0-9-0 degrees*", which the pilot read-back. By this stage, APP had already made several traffic information calls to the BE200 crew. Moments later at 1239:28, the Firefly crew free-called APP, "*Cranwell Approach [C/S] request visual recovery to Barkston with information J for overhead join*". This was acknowledged at 1239:33, "*[C/S] Cranwell Approach, J correct no radar traffic*". (SATCO commented that this call is a standard RT call and refers to the Barkston Heath radar pattern.) A further call was made to another BE200 in the instrument pattern before, at 1240:18, APP passed traffic information about the subject Firefly, "*[BE200 C/S] traffic 12 o'clock 3 miles crossing right left 1 thousand feet above descending Firefly*". This information was acknowledged by the BE200 crew with their C/S. Some 23 sec later at 1240:51, the BE200 crew transmitted without a C/S "*TCAS descending*". APP acknowledged this report before the BE200 crew transmitted at 1240:55, "*[BE200 C/S] is now in the TCAS climb*". At 1241:11 the Firefly crew transmitted to APP "*..[C/S] field in sight stud 11*". About 8 sec later at 1241:19, the BE200 crew reported "*[BE200 C/S] clear of the TCAS and re-descending to 2500*", whereupon APP instructed the crew to descend further to 1800ft.

The ATC Supervisor reported the weather at the time of the incident was such that visibility was good to moderate below 2500ft such that Barkston Heath could carry out VFR recoveries.

The BE200 crew was in receipt of a TRAFFIC Service and was passed relevant traffic information on the conflicting Firefly. The Firefly crew was passed airfield information and, although not stated on the RT, was provided with a BASIC Service. Under a BASIC Service a controller is not required to pass traffic information unless a definite risk of collision exists. Under the ATS provided, both crews were responsible for the deconfliction of their aircraft. The Firefly crew was told that there was no radar traffic; although this only referred to the Barkston radar pattern, this could be conceived as ambiguous.

UKAB Note (1): The Barkston Heath MATZ is notified as a 3nm radius from the midpoint of RW06/24, with a non-standard 2nm stub aligned on 058°(T), extending from the surface to 3000ft above the aerodrome elevation. The Barkston Heath MATZ conjoins the Cranwell MATZ that is of standard dimensions. Both form the CMATZ with Cranwell notified as the controlling authority for both. As Barkston Heath has the highest elevation of 367ft the CMATZ extends from the surface to 3000ft aal - an altitude of 3367ft amsl - excluding the Cranwell stub - which has a lower limit of 1000ft above the elevation of Cranwell at 218ft amsl.

UKAB Note (2): At the request of the UKAB, NATS Ltd helpfully conducted an InCAS simulation of this uncoordinated TCAS event.

The following assessment is based on single source radar data from the Claxby Radar Head. As radar data is available in roughly 6 second cycles and TCAS II utilizes a 1 second interrogation rate, the radar data is interpolated. The interpolation process has been known to cause discrepancies between actual and simulated TCAS II encounters.

The Firefly – squawking A2642 is not TCAS II equipped. At 1240:38 the BE200 crew – squawking A2601 received a TRAFFIC ALERT (TA) while in level flight at FL23. At 1240:49, the BE200 crew received a DESCEND RA against the Firefly. Ten seconds later at 1240:59, the RA for the BE200 was modified to an INCREASE DESCENT RA instructing the crew to increase their RoD. (At the time of this simulated RA, the *interpolated* radar data indicated that the BE200 was climbing). At 1241:03 the sense of the RA for the BE200 was modified to an upward 'sense' with a Reversal CLIMB RA. CLEAR OF CONFLICT was enunciated in the BE200 at 1241:08. No further alerts were simulated for this encounter.

Downlinked Mode S data for this day was not available from the ATM Safety Monitoring Tool (ASMT) – it was OOS. Without the downlinked Mode S data it is not possible to confirm independently what TCAS RAs were actually generated for this encounter.

UKAB Note (3): The LATCC (Mil) recording of the Claxby Radar illustrates this Airprox clearly. The BE200 King Air is shown steady on the DOWNWIND leg, level at 2300ft Mode C (1013mb) –about 2450ft QFE (1018mb)

[+150ft on the SAS] – passing S abeam Barkston Heath at 1240:22 and thus within the Cranwell CMATZ 'Barkston Heath Slot' about 16sec before the simulated TA occurred. The Firefly is shown descending through 3300ft Mode C (1013mb) – about 3450ft QFE – some 1000ft above the BE200 contrary to the latter pilot's account, as it crosses through the BE200's 12 o'clock at a range of 3-7nm. As the range decreases to 1-8nm at 1240:46, a momentary increase to 2400ft (1013mb) is shown by the BE200 some 3sec before the simulated DESCEND RA. The Firefly descends at a steady rate to 2400ft (1013mb) and draws L of the BE200 as the two ac close to a minimum observed horizontal separation of 0.5nm at 1241:02; by this time the BE200 has exited the CMATZ and descended to an indicated 2100ft (1013mb) in conformity with the TCAS DESCEND RA. On the next sweep the RA reversal into a CLIMB is evident as the BE200 climbs through 2400ft (1013mb). The vertical cross occurs before the next sweep, which shows the Firefly at 2200ft (1013mb) and entering the CMATZ some 200ft below the BE200 as the range starts to increase.

HQ AIR (TRG) comments that neither of the crews involved in this Airprox saw each other until after the CPA. The King Air crew were aware of the Firefly because of traffic information and TCAS alerts but the Firefly crew were not aware of their proximity to the King Air until some 3 days after the event. The RT call from ATC stating '*no radar traffic*' may have been a standard RT transmission referring to the Barkston Heath radar pattern but as the Firefly was crossing the Cranwell radar pattern during its recovery traffic information on the Cranwell pattern would have been useful to the Firefly crew.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It was evident to the Board that there was an anomaly between the BE200 QFI's report on the geometry of the occurrence and that reflected by the radar recording and TCAS simulation. When the BE200's TCAS enunciated the TA - warning the crew about the presence of the Firefly - the BE200 pilot reported the other ac was slightly below them, about 200ft initially he said, climbing on a reciprocal path from directly ahead of his ac. However, the Claxby Radar recording revealed that this was not the case. Although the Firefly did subsequently descend below the height of the BE200 triggering a TCAS RA reversal into a CLIMB, the recorded data had clearly shown that the Firefly was above the BE200 from the outset and had descended from above the BE200 whilst on recovery into Barkston Heath. Unless the BE200 QFI had misinterpreted the displayed TCAS indications at the time, which appeared unlikely, the Board considered that his recollections of the earlier stages of the encounter were, in all probability, mistaken.

Turning to the ATC aspects of this encounter, it was clear that the BE200 crew was operating under IFR, in VMC, under a TRAFFIC service from Cranwell APP whilst being vectored DOWNWIND in the RTC for an instrument approach to Cranwell. The Firefly crew, flying under VFR, was apparently operating under a BASIC Service from Cranwell APP whilst executing a visual recovery and the RT transcript of the APP frequency had reflected that the Firefly crew had free-called APP for their visual recovery into Barkston Heath moments after the controller had turned the BE200 onto the easterly DOWNWIND heading. Evidently, no specific ATS had been asked for by the Firefly crew at the time nor was it specified by APP; whilst it might have been the Unit SOP for visual recovery traffic to be under a BASIC Service, or deemed to be so, the type of ATS should normally be stated by the controller. Whilst it might not have been the case here, misunderstandings between aircrew and controllers very often stem from confusion over the type of ATS being provided at the time, so it is essential that this is established clearly - a salutary point.

More significantly APP had advised the Firefly crew about 1½min before the CPA that there was "*...no radar traffic*". The DAATM report had reflected SATCO Cranwell's comment that this was a standard RT call and did not encompass instrument traffic in the Cranwell RTC, but referred solely to ac flying in the Barkston Heath radar pattern. Whilst accepting the local view that had elaborated on this point for the benefit of the Board, controller Members, both civilian and military, were highly sceptical that this transmission would be understood in this way by the majority of military pilots which, without clarification, were likely to infer that there was no instrument traffic to conflict with the Firefly crew's visual approach. The Command had commented that traffic information on the Cranwell pattern would have been useful to the Firefly crew and the overwhelming view of the Members was that the RT call was at best confusing and, if overheard on the RT by another pilot not familiar with this local procedure, plainly open to misinterpretation. A military controller Member voiced doubt as to whether locally based pilots

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operating from Cranwell and Barkston Heath would have understood the specific meaning of this call. Pilot and controller Members alike concurred that the use of this phrase was plainly misleading, ambiguous and unwise in these circumstances and warranted further clarification. The Board was briefed by the DAATM military ATC Advisor that its use was being reviewed locally, which partially assuaged controller Members concerns.

It was unfortunate that the Firefly QFI had no direct recollection of the event, but it was plain to the Board that he had been given no prior warning by APP of the presence of the conflicting BE200. In this situation, controller Members believed that the conflict at the boundary of the CMATZ with the BE200 should have been obvious to the controller as soon as the Firefly crew called for recovery, but while there was no commitment to monitor the flight, APP had plainly identified the presence of the Firefly and recognised the threat to the BE200 because accurate traffic information had been passed to the latter's crew. Without any obligation placed on APP to pass traffic information under a BASIC service, good practice should have prompted the controller to pass on a warning to the Firefly crew before they descended towards the level of the twin and flew into close quarters. There was ample opportunity to do so, but this relied upon the good judgement of the controller at the time; Members opined that issuing traffic information or a warning would have been far better 'controllership' and would manifestly have assisted the Firefly crew's situational awareness. Considerable discussion ensued about the advisability of a warning on RT in these circumstances; the DAP Advisor explained that there had been considerable national debate about the application of the BASIC Service and what should or should not be given. Whilst the Firefly crew was ultimately responsible for their own separation against other ac, whether traffic information had been provided or not, APP was aware of the two ac on his frequency recovering to aerodromes in the CMATZ, which he controlled. In the opinion of the overwhelming majority of controller Members, a warning should have been passed to the Firefly crew in these circumstances. The Board agreed that the absence of traffic information to the Firefly crew about the BE200 was a Contributory Factor to this Airprox.

The Firefly pilot had no recollection of the event and believed that he had not passed unduly close to any other ac. However, at the distances revealed by the radar recording the BE200 was there to be seen and, in the Board's view, should have been spotted. However, it was pointed out that the BE200 could have been concealed beneath the Firefly's nose as the latter descended, which would have made it difficult to spot. Nevertheless, the Board concluded that non-sighting of the BE200 by the Firefly crew was part of the Cause.

The APP controller had issued the DOWNWIND vector to the BE200 crew 8sec before the Firefly crew had called. Whereas the Claxby Radar recording did not replicate exactly the picture displayed to APP at the time, the Firefly should have been evident on the Cranwell display when this instruction was issued. For this reason some controller Members were of the view that it was the controllers heading instruction that had set up the conflict between these two ac, with no form of separation being engineered in the first instance. A military controller Member suggested the Cause might be that APP vectored the IFR BE200 into conflict with the Firefly recovering VFR. However, this view did not prevail amongst the other Members. It was plain that the BE200 pilot had requested a TRAFFIC Service and as such the pilots had accepted that they were ultimately responsible for their own separation against other ac. As the BE200 pilots were following the instructions issued by the controller, Members questioned the advisability of being vectored in the pattern under a TRAFFIC Service when the crew were required to 'see and avoid' other ac themselves. It seemed illogical to some that, when following the controller's instructions for sequencing and spacing in the pattern, no consideration was taken of affording separation against other known inbound traffic, within or on the boundary of the CMATZ. Here accurate traffic information was provided to the BE200 crew about the Firefly at a range of 3nm, some 50sec after the latter's crew called. Whether this was in sufficient time for the BE200 crew to assess the situation and react appropriately was debatable, particularly since the BE200 crew were responsible for acquiring the Firefly visually and affording it appropriate visual separation. It was evident from the reporting pilot's account that the Firefly was not seen until after it had crossed ahead and was in his 7 o'clock position, having passed down the port side of his BE200 at a range of 100-200m at a similar height. Thus unseen by the BE200 crew beforehand, with no positive steps taken by ATC to establish separation because under the prevailing TRAFFIC Service none was required, it was left to TCAS to resolve the developing situation. Therefore, the Board agreed that as the Firefly was not seen until after it had passed behind their port wing this was effectively, a non-sighting by the BE200 crew and the other part of the Cause.

Whilst it seemed axiomatic that traffic entering the CMATZ visually would avoid instrument traffic, paradoxically it was the IFR flight constrained by the vectoring instructions that took action in the vertical plane to avoid the VFR flight that was itself free to manoeuvre. Whilst the NATS Ltd TCAS simulation revealed that this was a fleeting occurrence, the absence of downlinked Mode S data from the ASMT prevented the simulation from being

confirmed factually. Nonetheless, there was no reason to doubt their basic analysis that was helpful in establishing the timings of the relevant TCAS events, which lasted a mere 30sec from enunciation of the TA to the BE200 being CLEAR OF CONFLICT. Although alerted to the developing conflict by the TCAS TA, the Board recognised that the BE200 crew would have been unwise to manoeuvre on the basis of a TRAFFIC ALERT alone. Clearly, the pilots here still had 'TA+RA' selected, having been primed and aware of the position of the other ac from their display, it was not surprising that the BE200 crew's situational awareness was such that they could react promptly when they received the DESCEND RA. However, it was unclear if the momentary increase in the BE200's level by 100ft when the DESCEND RA occurred might have been an actual climb as a result of powering up the engine at idle or merely a momentary 'blip' in the Mode C data. A CAT pilot Member commented that during single engine or asymmetric approaches it is common practice to switch TCAS to 'TA only'. This is done to prevent another Mode S TCAS fitted ac from entering into a 'co-operative' RA, when the ac with 'one engine inoperative' might be unable to achieve the minimum RoC required to ensure collision avoidance during the RA manoeuvre. It was unclear to the Board if this was SOP for the BE200 pilot's unit, but it seemed to some unwise to do this in Class G airspace in a practice single engine scenario when the other engine could be quickly powered up. It was also apparent that an RA reversal had occurred with CLIMB NOW being enunciated as the Firefly crew kept descending towards the unseen BE200 and vertical separation reduced to 31ft the simulation suggested. Clearly TCAS is capable of reacting to situations where the other ac is not TCAS equipped and no co-ordinated resolution is feasible - as here. But in a CAT pilot Member's view where TCAS has to modify the resolution advice to the crew, especially in events such as this when an RA reversal from a DESCEND into a CLIMB takes place, this heightens the Risk. In his view, and that of some other Members, when one ac is not TCAS equipped and the action to resolve the conflict is uncoordinated, the safety of the ac involved is not assured. However, it was evident that TCAS was able to ameliorate the changing situation and the BE200 crew had reacted promptly by climbing. Thus moments later, coupled with the constant descent of the Firefly, separation had increased sufficiently such that the conflict was passed. Even though these two ac passed each other – 0.31nm apart the simulation suggests - as they crossed in the vertical plane with none of the pilots involved achieving visual contact with the other ac in time to affect the outcome, TCAS proved capable of resolving the conflict. This convinced the overwhelming majority of the Members that no Risk of a collision had existed in these circumstances.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Non-sighting by the Firefly crew and an effective non-sighting by the BE200 crew.

Degree of Risk: C.

Contributory Factors: Absence of traffic information to the Firefly crew about the BE200.

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AIRPROX REPORT NO 2009-029

Date/Time: 22 Apr 1232

Position: 5022N 00358W (6nm SE Plymouth - elev 476ft)

Airspace: LFIR (Class: G)

Reporting Ac Reported Ac

Type: DHC8 C172

Operator: CAT Civ Trg

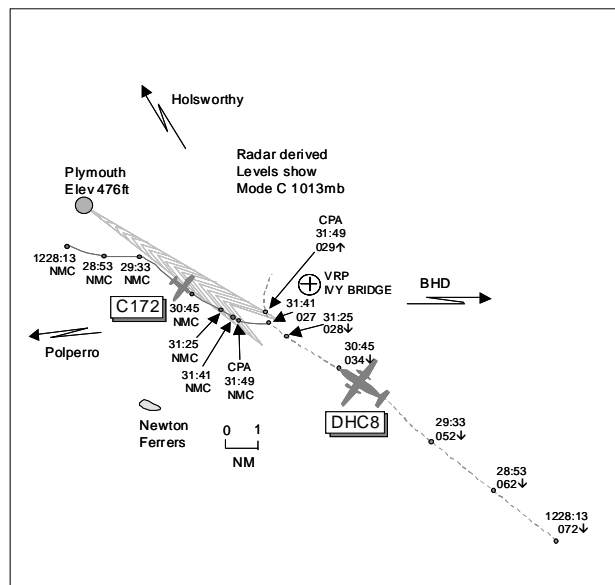
Alt/FL: 3500ft↓ 4200ft
(QNH 1026mb) (QNH 1027mb)

Weather IMC KLWD VMC CLAC

Visibility: 5nm

Reported Separation:
<1nm H 500ft V/2nm H

Recorded Separation:
0.8nm 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 4550 with Modes S and C. Approaching on the ILS RW31 heading 306° at 165kt descending through 3500ft QNH 1026mb and cleared by ATC for an ILS approach, they were aware of another ac, the subject C172, being asked to remain S of the let-down path. On 6nm final the C172 was seen on TCAS showing NMC 1nm in front flying across their track, setting off a TCAS TA. They broke-off their approach to the N and climbed above cloud before making another approach. They did not visually acquire the C172 owing to IMC and he assessed the risk as medium.

THE C172 PILOT reports flying a local navigational training sortie from Perranporth VFR and in receipt of a Basic Service from Plymouth on 133.55MHz squawking with Mode C, he thought. At their eventual level of 4200ft QNH 1027mb, the visibility was 5nm flying 1000ft above cloud in VMC and the ac was coloured white/blue with strobe lights switched on. The planned route was to Ivybridge [a VFR 8nm ESE Plymouth airport, just N of RW31 FAT], Holsworthy [25nm NNW Plymouth] before returning to Perranporth at 3000ft. En-route abeam Liskeard they climbed to 4000ft to remain VMC above broken cloud, contacting Plymouth at 1225 giving their routeing and an ETA of 1225 at Ivybridge. They were asked to report S abeam Plymouth airport which they did at 1228 sighting the airport at 1nm distant. They were then asked to remain S of the approach path to RW31, owing to approaching traffic. By now they were close to the extended C/L: nevertheless they turned onto a heading towards Newton Ferrers [7nm SSE Plymouth] to clear. It might have been better to have turned N in view of their position and routeing. Shortly afterwards heading 150° at 105kt they sighted a DHC8 in their 10 o'clock range 2nm at about their height, possibly 500ft below, and called 'contact'. There was considerable RT traffic as Plymouth was working several ac. However the DHC8 was already turning to the R to avoid conflict, probably triggered by his TCAS. They then requested to turn N towards Holsworthy with the DHC8 clearly in sight over 4nm turning away, which was acknowledged with a request to ATC after landing. At no time did he consider there was a risk of collision.

THE PLYMOUTH ADC/APP reports acting as an OJTI to a trainee on the combined Tower and Approach positions. The C172 flight called at 1223 5nm E of Polperro routeing to Ivybridge then Holsworthy at 4000ft requesting a BS. One minute later Plymouth Mil called for an acceptance level for the DHC8 inbound for the ILS RW31; FL35 was allocated. At 1226 the C172 pilot was given a BS and instructed to remain S of RW31 letdown lane as the DHC8 was inbound for an ILS approach. Two minutes later the DHC8 flight called on frequency 18nm SE of Plymouth and when the C172 pilot reported S abeam shortly afterwards at 1229 the trainee told the flight to remain S of the RW31 FAT to which the pilot agreed. At 1231 the DHC8 crew reported on the ILS and were told of general handling traffic in the area, the C172, and a PA28 that had recently departed to the SE. One minute later the DHC8 crew reported he had TCAS traffic ahead and was breaking-off the approach. He, the OJTI, took control and requested the C172 pilot to report his position which was given as approaching Ivybridge. The VDF

bearing indicated the C172 being just N of the RW31 FAT so he informed its pilot that he had just flown across the approach to RW31 in front of a DHC8 on the ILS; the C172 pilot reported that he had the DHC8 in sight. He asked the C172 pilot to descend, owing to the DHC8 returning to the ERMIN hold, but the pilot said he was unable to descend, as it would put him in IMC. The DHC8 was cleared for an ILS from the ERMIN hold when the C172 was clear of the approach.

The Plymouth METAR shows EGHD 221220Z 22005KT 9999 FEW015 SCT020 13/09 Q1027=

THE PLYMOUTH SATCO comments that the incident occurred during bandboxed operations as the ADC position was unavailable owing to a major Voice Communication and Control System (VCCS) unserviceability.

ATSI comments that the Plymouth Approach and Aerodrome Control positions were being operated combined by a mentor and trainee. NB. The ADC position was reported as being unserviceable at the time. Plymouth is not equipped with radar. The Plymouth ATZ is a circle, radius 2nm, centred on the longest notified runway (13/31), from surface to 2000ft aal.

The DHC8 was inbound to Plymouth from Guernsey on an IFR plan. The pilot contacted Plymouth Approach at 1219, whilst still under Jersey ATC's control, to request the weather information. The 1150 weather was issued, with no change expected for the 1220: surface wind 190°/7kt; visibility 25km with nil weather; cloud few 2000ft, broken 2500ft; QNH 1027mb and the RW in use was 31. Just before 1223, the pilot of the subject C172 established communication with Plymouth Approach. He reported approximately 5nm to the E of Polperro at an altitude of 4000ft on QNH 1021mb. He was on a flight returning to Perranporth, routeing via Ivybridge and Holsworthy and requested a Basic Service (BS). Although no response was made, on the frequency, to the pilot's request for the ATC service, the controller wrote in his report that he was providing it with a BS.

'A Basic Service is an ATS provided for the purpose of giving advice and information useful for the safe and efficient conduct of flights. Basic Service relies on the pilot avoiding other traffic, unaided by controllers. It is essential that a pilot receiving this service remains alert to the fact that, unlike a Traffic Service and a Deconfliction Service, the provider of a Basic Service is not required to monitor the flight. Pilots should not expect any form of traffic information from a controller, as there is no such obligation placed on the controller under a Basic Service outside an ATZ, and the pilot remains responsible for collision avoidance at all times'. The C172 did not enter the Plymouth ATZ.

The C172 flight was instructed to squawk 7010 (for ac operating in an aerodrome traffic pattern).

[UKAB Note (1): Two minutes before the C172 pilot's initial call to Plymouth just before 1223, the C172 is seen to change from a 1747 squawk (Newquay conspicuity code) showing FL33 (3720ft QNH 1027mb) and climbing, to a primary only return for 1min and then a 7000 squawk with NMC. Thereafter NMC is displayed on radar.]

Just after 1226 the pilot was requested to *"...report south abeam Plymouth and remain er south of the let down lane for runway three one traffic is a Dash Eight inbound shortly estimating er minute three zero"*. At the time, the C172 was 5nm WSW of the airport. The pilot replied *"will report south abeam Plymouth er and remain south of runway C172 c/s"*.

The DHC8 flight contacted Plymouth Approach shortly after 1228. He reported passing FL72 and on final approach RW31 at 18nm. The crew was instructed to descend to 2700ft, to report passing FL35. Shortly afterwards at 1228:53, the C172 pilot reported *"...passing south abeam your runway"*. The radar photograph indicates it was 1.9nm SSE of the airport. Again he was instructed to *"...remain south of the final approach track for runway three one Dash Eight making a final approach on the ILS"*. The pilot replied *"Roger we'll remain south abeam of the runway (C172 c/s) currently at four thousand feet on One Zero Two Two"*. The pilot had not been informed of the Plymouth QNH 1027mb. The controller reiterated *"...I say again remain south of the final approach track for the let down lane for runway three one"*. The pilot responded *"...roger remain south of the approach track for runway three one"*.

The DHC8 crew reported having just passed FL35 at 1230:50. The radar timed at 1230:46 shows the DHC8 passing FL34 (3820ft QNH 1027mb), the C172, with NMC, is 5.3nm ahead of it, tracking SE. The DHC8 was cleared for the ILS and warned about *"...general traffic handling out to the southeast various levels VFR"* (the C172 and a P28A). The pilot reported *"Roger we've got something about three miles ahead of us"*. The C172 was asked

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at 1231:25 to report his position. “...we are just south of Ivybridge now we'd like to turn on track towards Holsworthy”. The subject ac were now 2.2nm apart, the DHC8 descending through FL28 (3220ft QNH). The controller assessed from VDF indications that the C172 had crossed the approach path. After comments from the controller regarding the relative positions of the subject ac, the pilot of the C172 reported he was visual with the DHC8. The pilot of the DHC8 transmitted “DHC8 c/s we've just broken off the approach we'll make a righthand orbit and when they're out of the way we'll re-establish on the ILS”. The radar at 1231:41 shows the DHC8 in a R turn level at FL27 (3120ft QNH). The C172 is 1.1nm W of the DHC8. Subsequently the ac pass 0.8nm apart, at 1231:49, the DHC8 climbing through FL29 (3320ftQNH).

[UKAB Note (2): The C172 pilot had reported on RT level at 4000ft on a QNH of 1022mb (4150ft QNH 1027mb) and subsequently at 4200ft QNH 1027mb in his Airprox report form.]

During the event, the DHC8 was being provided with a Procedural Service (PS) from Plymouth ATC. ‘A Procedural Service is an ATS where, in addition to the provisions of a Basic Service, the controller provides vertical, lateral, longitudinal and time instructions, which if complied with, shall achieve deconfliction minima against other aircraft participating in the Procedural Service’. On this occasion, because the C172 was operating VFR under a Basic Service, there was no requirement for the subject ac to be de-conflicted. The Plymouth Approach Controller instructed the C172, on numerous occasions, to remain S of the RW31 approach path because of the DHC8's arrival. The MATS Part 1, Section 3, Chapter 1, Page 2, states ‘Although flight in Class F and G airspace outside the ATZ is permitted without an ATC clearance, controllers will act on the basis that pilots will comply fully with their instructions in order to promote a safer operating environment for all airspace users’. Both flights were issued with TI about each other, albeit as a general call to the DHC8 pilot i.e. VFR traffic to the SE.

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 neither of the subject flights had agreed a service with Plymouth ATC although this had not materially affected the outcome of the incident. The C172 pilot had requested and then assumed that a BS was being provided and the DHC8 crew had believed they were under a PS whilst inbound for the ILS onto RW31.

Crucial to this Airprox however was the C172 not squawking Mode C. It was clear from the radar recording [see UKAB Note (1)] that the ac was squawking with Mode C until the flight changed from its Newquay code to 7000 prior to contacting Plymouth: this ‘Mode A only’ setting was retained thereafter, even when the APP allocated the 7010 code. It appeared to Members that when the C172 pilot had complied with the recommended guidance to select standby whilst changing Mode A codes, he had then omitted to reselect Mode C with Mode A. Without the benefit of Mode C height-readout from the C172, the ac would only generate TA alerts to TCAS equipped ac such as the DHC8. The DHC8 crew were unsure as to the identity and level of the traffic they could see on their TCAS display close to the FAT as the C172 pilot had been told to remain S of it. Both crews were proceeding in accordance with their flight rules and clearances but the DHC8 crew were unable to visually acquire the C172 to discharge their responsibilities in Class G airspace to maintain their own separation from other traffic through ‘see and avoid’. So when the other ac produced a TA alert ahead of their track, the DHC8 crew elected to break-off their approach to the R owing to IMC. The radar recording showed that as instructed the C172 had remained just S of the FAT. Its pilot having reported at 4000ft on 1022mb was however unknown to the DHC8 crew. The C172 pilot had seen the DHC8 as it broke-off its approach and watched it pass clear to his L. Taking all of these elements into account, the Board concluded that this had been a conflict in Class G airspace in the vicinity of the Plymouth FAT and that the actions taken had been effective in removing any risk of collision.

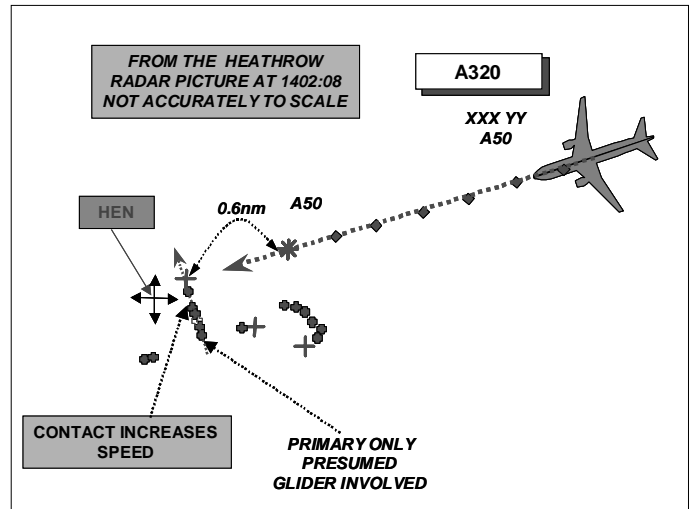
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A conflict in Class G airspace in the vicinity of the Plymouth FAT.

Degree of Risk: C.

AIRPROX REPORT NO 2009-030

Date/Time: 21 April 1402
Position: 5146N 00044W (Approaching HEN)
Airspace: London TMA (Class: A)
Reporting Ac Reported Ac
Type: A320 Untraced Glider
Operator: CAT NK
Alt/FL: 5000ft NK
 (QNH 1026mb) NK
Weather VMC Haze NK
Visibility: 10km NK
Reported Separation:
 0ft V/1nm H NR
Recorded Separation:
 NR V/ 0.2nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE A320-200 PILOT reports flying a SID from Luton and while approaching HEN NDB at 250kt and climbing through [actually just levelled at] an alt of 5000ft in slight haze, he saw a glider in a steep (20 degree) descent crossing from left to right across his nose and passing through their alt. He estimated the distance as being between 1 and 2nm. He had no TCAS indication from the glider and reported the incident on the radio to London Control, assessing the risk of collision as being low.

UKAB Note (1): The incident can be seen on the recordings of several radars. The Heathrow 23cm shows it most clearly with several (at least 4) primary-only contacts, presumed to be gliders, manoeuvring (probably soaring) in the vicinity of HEN. At 1401:30 one contact rolls out of a left hand orbit to cross 0.6nm in front of the A320 on a steady track of 355° while the airliner is heading 257° and level at 5000ft amsl. At the time of the incident one of the other primary contacts is 1½ nm to the S of the airliner still manoeuvring and another is ½ nm to the S of it and orbiting away to the right. The CPA was measured as 0.2nm when the glider was in the airliner's 2 o'clock, most likely by then well below it.

UKAB Note (2): RAF Halton airfield (the closest to HEN) was closed during the period of the Airprox and records show that they had no civil or military powered ac or gliders airborne during the period of the closure.

UKAB Note (3): The BGA provided valuable assistance both in trying to trace the glider and with an assessment of the weather conditions prevailing at the time. All Dunstable based pilots airborne at the time were contacted and ruled out. Following inspection of the data recorded on several Dunstable based gliders, expert opinion was that in the conditions at the time of the incident it was unlikely that any unpowered gliders would have been able to climb much above 3000ft agl in the incident area. That being the case the search was concentrated on powered gliders. The owners of all powered gliders based within about 50nm of the incident were contacted and almost all were either not airborne (the majority) or not flying in the area. That being the case it was concluded that the glider must have come from further afield. Although the (glider) contact showed on radar for some time before and after the incident, it could not be followed long enough in either direction to determine its take off or landing points. Since however, the recorded radar data verified the A320 pilot's report, there is good reason to believe that the (probably powered) glider penetrated the Class A CAS of the London TMA 0.1nm to the E of HEN. Two nm to the N of the incident position, the base of CAS rises from 3500ft to 4500ft and it was concluded by BGA experts that the glider pilot, on realising the error or possibly seeing the airliner, descended rapidly heading N (towards the area with higher CAS base) to leave Class A airspace and return to Class G as quickly as possible. This theory supports the belief that the glider was not locally based as most Halton, Booker, Dunstable and other local glider pilots are acutely aware of the constraints imposed by the CAS in that area.

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ATSI reports that the incident occurred within Class A CAS of the LTMA at 5000ft, near HENTON (HEN) NDB. The base of Controlled Airspace in the immediate area is 3500ft amsl (4500ft 2nm N). Following departure from Luton on a CPT3B SID, the A320 established communications on the TC Bovingdon Sector frequency, reporting climbing to 5000ft. At 1402, when the A320 had reached 5000ft and was approaching HEN, the pilot reported “...be advised just had a glider descending through our altitude about one mile ahead”. The report was acknowledged and the SC issued the flight with a climb to FL70. The SC then asked for the glider’s direction of flight, the pilot replying ‘East to West’ [sic]. While not stated on the RTF at the time, the controller later reported that the glider was not observed on radar. This is corroborated by a review of the recording of Debden radar, the service being used by the controller, and also the default service for this Sector.

There are no implications for ATC in this incident.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the A320 pilot, transcripts of the relevant RT frequencies, radar video recordings, reports from the air traffic controller involved and reports from the appropriate ATC authorities.

The Board acknowledged with thanks the assistance given by the BGA in this investigation.

There was some discussion as to whether or not the untraced aircraft had actually entered CAS. Regretting the absence of Mode C information from the untraced aircraft, Members nevertheless accepted the A320 pilot’s assessment that the other ac had descended through their level which would mean that it was indeed inside CAS at the point of the Airprox.

A Controller Member observed that it is most important that glider pilots are aware of the boundaries of CAS, even more so when operating in an unfamiliar area or well away from their home base. He also pointed out that had the glider been fitted with a transponder, it would have been visible both to the airliner’s TCAS and to the controller and most likely appropriate avoiding action would have been initiated.

As regards the degree of risk in this incident, on the basis of the A320 pilot’s assessment of ‘low’, the Board was content that safety had not been compromised in the circumstances reported here.

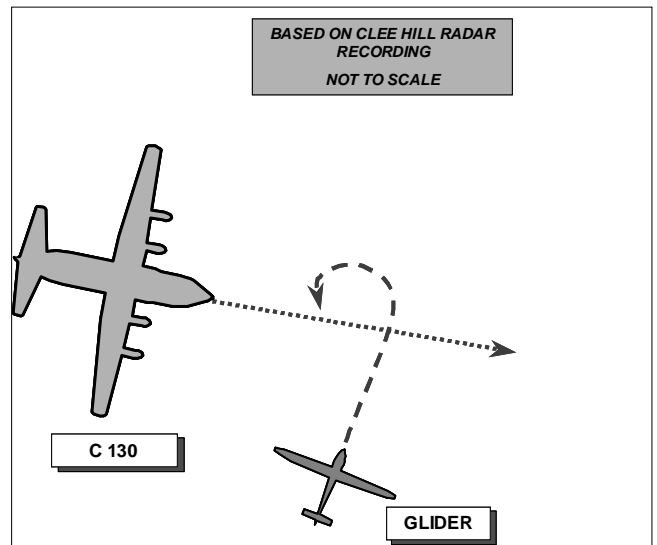
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The pilot of the untraced aircraft penetrated Class A CAS without clearance and flew into conflict with the A320.

Degree of Risk: C.

AIRPROX REPORT NO 2009-031

Date/Time: 25 Apr 1344 (Saturday)
Position: 5123N 00122W (17nm SW Benson)
Airspace: Lon FIR (Class: G)
Reporting Ac Reported Ac
Type: C130J Untraced Glider
Operator: HQ Air (Ops) NK
Alt/FL: 2400ft NK
 (QNH 1007mb) (NK)
Weather VMC CLBC NK
Visibility: >40km NK
Reported Separation:
 100ft V/30m H NK
Recorded Separation:
 NK

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

THE C130J PILOT reports on a local training flight from Lyneham squawking 7000 with Modes C and S, not in contact with any ATC unit but with a fully serviceable TCAS. While heading 090° at 145kt and 2000ft agl, just to the W of Newbury, a white glider was seen visually in their 2-3 o'clock, very slightly above them and at very close range (100ft away). The glider was heading roughly 350°, was straight and level, was not displayed on their TCAS and its pilot appeared not to have seen them. The pilot flying [the C130] bunted their ac and descended rapidly to avoid the glider and increase the separation. No avoiding action was seen by the glider and both ac then continued on their respective courses. He assessed the risk as being very high and reported the incident the following morning.

Despite extensive tracing action the glider involved could not be identified.

UKAB Note (1): The recordings of the Cleve Hill and Heathrow radars show the lead-up to the incident. At 1342:48 the C130 is squawking 7000, indicating an altitude of 2500ft on the London QNH of 1007mb and tracking about 100° when a primary-only contact, presumed to be the glider involved, pops up manoeuvring in its 1230 position. At 1343 the glider rolls out on a track of about 010° for a short time then commences another orbit to the left towards the C130 just after it crossed through the C130's 12 o'clock. The C130's Mode C readout reduces by 200ft as the ac cross and then climbs back to its former alt. At 1343:36 the contact assumed to be the glider disappears in the C130's 12 o'clock at a distance of ½ nm but reducing rapidly, just as the C130 commences a descent. By projection, if the glider continued its left hand orbit after it disappeared from the radar recording, the C130 would have passed directly below it. The glider did not reappear on the recordings of either radar.

HQ AIR (OPS) comments that the C130 crew spotted the glider close aboard but with sufficient time to react and increase the separation.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the C130J pilots, a radar video recording and a report from the ac operating authority.

The C130J pilot commented that he acquired the glider late due to it being straight and level with little relative motion and white in colour (against a white background). Furthermore, particularly when viewed almost head on, gliders have a small cross section making visual acquisition even more difficult. Bearing in mind the size, proximity and noise emitted by the C130J, Members were surprised that the glider pilot did not see it and also submit a report.

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Under the Rules of the Air Regulations (Rule 9 (1a)), the glider had right of way but 'see and avoid' is only effective if pilots see an opposing ac in sufficient time to take meaningful avoidance if required. In this instance the C130J pilots saw the manoeuvring glider about 100ft away, they estimated, which, pilot Members considered, meant it unlikely that the bunt initiated by the C130J pilot would have taken effect in the 2sec before his ac passed through the glider's nose. It was therefore fortunate that there was both vertical and horizontal separation between the two ac. That being the case, although this extant separation ensured that there was no collision risk Members agreed that there had been a degradation of normally accepted safety margins.

One pilot Member observed that, had the glider carried a transponder, then the C130J's TCAS would most likely have given the crew sufficient warning of its presence to take early and effective avoidance.

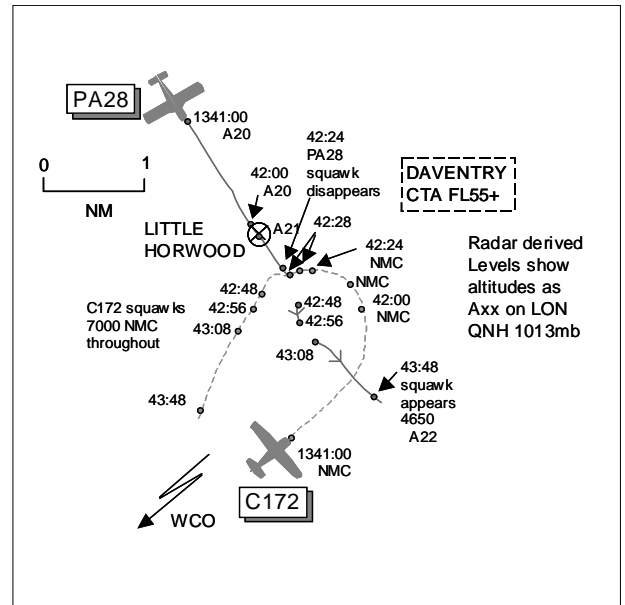
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: An apparent non-sighting by the untraced glider pilot and a late sighting by the C130J pilots.

Degree of Risk: B.

AIRPROX REPORT NO 2009-032

Date/Time: 24 Apr 1342
Position: 5157N 00051W (7nm NNE WCO)
Airspace: FIR (Class: G)
Reporting Ac Reported Ac
Type: C172 PA28
Operator: Civ Trg Civ Trg
Alt/FL: 2000ft 2200ft
(QNH) (QNH)
Weather VMC CAVOK VMC NK
Visibility: >10km NK
Reported Separation:
50ft V/<100ft H Nil V/100m H
Recorded Separation:
<0.1nm



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE C172 PILOT reports flying a dual training sortie from Elstree VFR and in receipt of a AFIS from Elstree Information on 122.4MHZ squawking 7000; he was unsure whether the ac was fitted with Mode C. The visibility was >10km in CAVOK VMC and the ac was coloured white/red with anti-collision beacon switched on. He was instructing a qualified PPL towards an IMC rating and was introducing him to NDB tracking. As this was the PPL holder's first use of the ADF and as he had been flying 'under the hood' for the previous 3 days, they decided not to use a hood so both pilots were looking out. They had tracked away from WCO on the 020° radial and then turned L back towards the beacon heading 200° at 2000ft and 100kt, when suddenly an ac, a PA28, appeared from behind their R wing, slightly above and <100ft away. Immediately prior to this the PPL holder was looking at the DI and RBI and the instructor was looking out to the front towards Westcott disused aerodrome. The instructor immediately took control, pushing forwards on the controls, diving the ac and turning to the R believing the other ac was pulling up and also turning R; he estimated that they passed <50ft vertically and <100ft horizontally. He noted the other ac's registration from his brief glimpse of it and believed it to be another training ac from Elstree [actually Denham]. He opined that the combination of their high wing ac at a slightly lower altitude than the low wing PA28 with both converging had led to their ac being obscured to the PA28's pilot by its engine until very late. Also this would have been further aggravated with both ac having an instructor in the RH seat putting himself close to the wing root and the PA28 instructor's view obscured by the engine cowling. Furthermore, this incident had occurred at 2000ft QNH, an altitude that he usually avoided like the plague, because the PPL holder had drifted down from 2300ft whilst concentrating on the ADF.

THE PA28 PILOT reports flying a dual local navigation training sortie from Denham, VFR and in receipt of a BS from Farnborough N on 132.8MHz, squawking an assigned code with Mode C. The visibility was >10km. He was cruising at 2200ft whilst 1500ft below cloud in VMC in a white/green coloured ac with strobe and nav lights switched on. Whilst routeing between Silverstone and Bovingdon in the vicinity of Little Horwood heading 150°, he was pointing out a ground reference feature to the student when a rear observer called 'traffic 10 o'clock'. He looked up and saw a low wing, he thought, single engine ac coloured white/blue/red 500m away in an apparent slow climb. He immediately altered course 30° to the R and simultaneously the other ac also altered course to the R, deviating to pass behind. He estimated at the CPA the ac were at the same level 100m apart. He assessed the risk as medium.

ATSI reports that the incident took place in Class G airspace, 7nm NE of Westcott (WCO) NDB in the vicinity of Little Horwood, a disused aerodrome. At 1341:46, the pilot of the PA28 established communications on the Farnborough LARS N frequency. He reported returning to Denham, currently overhead 'Little Harwood' (sic) at

AIRPROX REPORT No 2009-032

2000ft on 1013mb and requesting a BS. The controller confirmed that the QNH was correct (for the LARS N sector), issued a discrete SSR code 4650 and placed the flight under a BS.

A BS is described in full in MATS Part 1 Section 1 Chapter 11 Page 4 Paragraph 3. It is defined as:

“...an ATS provided for the purpose of giving advice and information useful for the safe and efficient conduct of flights. This may include weather information, changes of serviceability of facilities, conditions at aerodromes, general airspace activity information, and any other information likely to affect safety. The avoidance of other traffic is solely the pilot’s responsibility. Basic Service relies on the pilot avoiding other traffic, unaided by controllers. It is essential that a pilot receiving this service remains alert to the fact that, unlike a Traffic Service and a Deconfliction Service, the provider of a Basic Service is not required to monitor the flight.”

In addition, *“A controller may identify an aircraft to facilitate co-ordination or to assist in the provision of generic navigational assistance, but is not required to inform the pilot that identification has taken place. Identification of an aircraft in receipt of a Basic Service does not imply that an increased level of service is being provided or that any subsequent monitoring will take place.”*

The C172 flight was not receiving a Service from Farnborough and LARS N was not aware of its presence. There are, consequently, no implications for ATC in this incident

UKAB Note (1): Analysis of the Heathrow 23 and 10cm radars at 1341:00 shows a 7000 squawk, showing NMC, believed to be the C172, 2nm S of Little Horwood disused aerodrome tracking 045° with the PA28 3.25nm to its NNW tracking 150° indicating 2000ft altitude (London QNH 1013mb). About 30sec later the C172 crosses through the PA28’s 12 o’clock from R to L range 2.3nm. The C172 is then seen to commence a L turn and by 1342:00 it is turning through NW in the PA28’s 1130 position, range 1.3nm; the PA28 is just about to pass over Little Horwood and its pilot is passing his flight details to Farnborough N. Eight seconds later the PA28’s Mode C indicates 2100ft followed by its squawk disappearing at 1342:24 which correlates to the pilot having just completed a read back of the Farnborough assigned discrete code and the type of ATS offered; the C172 is turning through a W’y heading with the PA28 to the W range 0.3nm. The next radar sweep 4sec later shows the ac closing to 0.1nm the C172 still turning L as the PA28 crosses ahead. The CPA is estimated to occur during the period ahead of the next radar sweep. However the PA28 does not paint on the next sweep whilst the C172 is seen to have turned R, in accordance with his reported avoiding action. The CPA is estimated to be <0.1nm. The PA28 reappears on radar, still as a primary only return, at 1342:48 tracking 175° 0.3nm E of the C172, which has meanwhile turned L onto a SSW’y track towards WCO. The PA28 fades again after 1342:56 before appearing again at 1343:08 tracking SE’y, with both ac diverging. The Farnborough assigned code of 4650 appears at 1343:48 indicating 2200ft QNH.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members noted the C172 instructor’s comment with respect to the ac’s transponder Mode C fit. Although NMC was displayed by the ac on the recorded radar, Members were keen to promote the value of selecting Mode C on the transponder, if fitted, for the benefit of ATCOs at SSR-equipped ATSUs and the functioning of the STCA and ACAS safety nets. During this encounter in Class G airspace both pilots were responsible for maintaining their own separation from other traffic through ‘see and avoid’. A pilot Member opined that this was busy airspace used by several flying training establishments because the base of CAS was high, making it suitable for most GH training sorties. The geometry exposed by the radar recording had shown that the opportunity was there for both pilots to acquire visually each other’s ac for some time prior to their actual sightings. The C172 had crossed 2.3nm ahead of the PA28 from R to L before it turned back L towards WCO. However, at the same time the PA28 flight was contacting Farnborough to establish a service and then subsequently the pilot was changing the squawk code 4sec before the CPA. Similarly, the PA28 was in the area that the C172 pilot should have cleared during his lookout scan prior to turning L; it was then approaching from C172’s R and should have been in the instructor’s field of view clear of the wing root. Pilot Members were familiar with the workload in both cockpits during instructional flights; a fine balance needs to be struck between lookout and heads-in mentoring. The PA28 was carrying out a navigational sortie in which the instructor would have been teaching the identification and correlation of ground features to places depicted on topographical charts as well as ensuring that accurate headings were flown and enroute timing points checked. The C172 PPL holder was practicing IF with the instructor teaching NDB tracking

using the onboard ADF equipment, which would involve frequent periods of monitoring the student's actions interspersed with visual scanning for other traffic. However, these actions should not be to the detriment of maintaining a good lookout at all times. As it was, for whatever reason, both pilots only saw each other late and this was the cause of the Airprox.

Although a close encounter, the Board agreed that the late actions taken by both pilots had been enough to avert the actual risk of collision but the ac had passed with safety margins much reduced such that safety had not been assured during this encounter.

PART C: ASSESSMENT OF CAUSE AND RISK

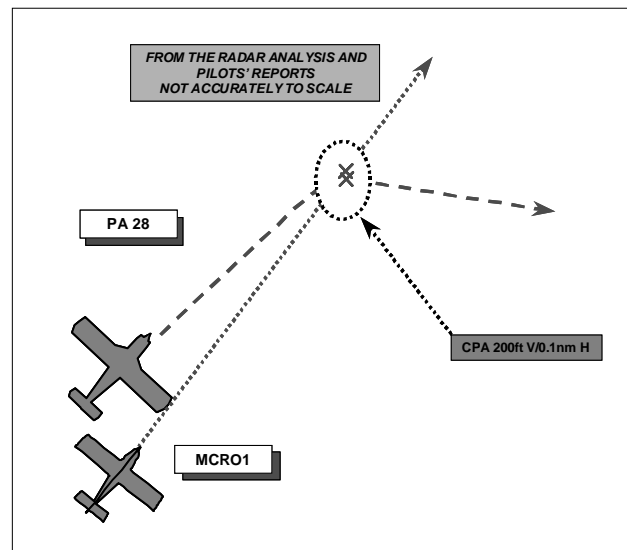
Cause: Late sightings by both pilots.

Degree of Risk: B.

AIRPROX REPORT No 2009-033

AIRPROX REPORT NO 2009-033

Date/Time: 26 April 1115 (Sunday)
Position: 5241N 00218W (2½ nm N Cosford)
Airspace: London FIR (Class: G)
Reporting Ac Reported Ac
Type: PA28 MCRO1
Operator: Civ Club Civ Pte
Alt/FL: 1300ft 1500ft
(QFE 993mb) (N/K)
Weather VMC CLBC VMC CLBC
Visibility: >10km >20km
Reported Separation:
0ft V/50m H prob not seen
Recorded Separation:
200ft V/0.1nmH



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE PA28 PILOT reports flying in a red and white ac with all lights switched on on a local VFR flight with 2 passengers, squawking 7000 with Mode C and in receipt of a Basic Service from Cosford TWR. The Weekend Procedures for recoveries to Cosford were in force which require that ac report at the unpublished VRP Alpha, a small lake 0.5nm N of the ATZ, not below 1300ft QFE. He had already reminded his passengers about keeping a good lookout, especially when approaching a VRP. He had just reported at point Alpha to Cosford TWR, while level at 1300ft and heading 100° at 90kt, and they replied with “C/S proceed direct to finals”. This required him to track directly to RW24 North side grass and as he was about to commence his right hand turn, he started to scan from left to right but before his head came round to the right, his passenger in the rear right hand seat reported “traffic 5 o’clock”. He looked round and immediately saw an aircraft about 75-100m behind them and about 20ft above them, travelling at about 130kts. He maintained his heading and the other ac passed to their left about 50m away in a descent.

The incident evolved very quickly and he considered that maintaining his course was the best course of action; he could not turn to the right since the other ac was on that side and turning to the left would have put him belly-up to it. Also he was unsure if the other pilot could see him and was on a parallel course and overtaking them while descending. He assessed the risk of collision as being very high as, had he been flying solo, the approaching ac was in his blind side and he would have been commencing a right hand turn towards the airfield.

He only heard one other ac on frequency at the time (with a C/S) but that was a PA28 en-route to Barton. Its pilot reported East abeam Cosford and although he was not visual with it he was certain that it was not the ac with which he had had the Airprox.

UKAB Note (1): The PA28 pilot described the other ac involved in the Airprox as being a white (with coach lines) high-performance 2-seat microlight with winglets which fits accurately with the reported ac.

THE LANG MCRO1 PILOT reports flying a white ac with SSR fitted and Mode C selected on, listening out on the Shawbury APP frequency. He and his passenger were on a private flight from Shobdon to Sleaf via Stafford. [UKAB Note (2): The incident taking place on a Sunday, Shawbury was closed]. The only ac that he saw during the flight was a PA28 at 1500ft tracking about 050° but it was too far away to distinguish its colour or markings and it passed about 50ft below them and was 800m away. If that was not the ac involved then they did not see the reporting ac.

UKAB Note (3): Although the recording of the Cleve Hill Radar shows the incident, in respect to both ac it suffers from track jitter. However, it is clear that a contact squawking 7000 with Mode C, presumed to be the MCRO1, overtakes another contact whose flight profile fits that described by the PA28 pilot. The MCRO1 flies from the

PA28's 5 o'clock while the latter is tracking about 045° level at FL017. The MCRO1 overtakes the PA28 in a very slow descent from FL020 passing almost directly above, separated by 200ft vertically as the PA28 commences a right turn onto 120°.

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 had been operating legitimately in Class G airspace where the prime means of collision avoidance is 'see and avoid'.

The Board noted the discrepancies between the two pilots' reports but the radar recording showed that, providing that the ac squawking 7000 was the MCRO1, the PA28 pilot's description of events was accurate. That being the case, Members agreed that the MCRO1 was overtaking the PA28 as depicted in the diagram above and should therefore have given way to it under the Rules of the Air (Rule 11). The Board tried to determine why the MCRO1 pilot had not seen the PA28 ahead and slightly to the left of his ac. No-one present was familiar with the ac or its layout. Discussion was based solely on opinion, a pilot Member suggesting that the PA28 might have been below the MCRO1's nose and therefore obscured to the pilot but no other factors were offered.

When discussing the degree of risk the Board noted that the PA28 passenger had first spotted the MCRO1 in the PA28 pilot's blind area and had done well to inform the pilot who in turn saw it - but by then it was fairly close. On seeing the opposing ac, the PA28 pilot determined that the best separation would be afforded by continuing his current flightpath. That being the case Members agreed that there had been no risk of the MCRO1 colliding with the PA28. Since however the MCRO1 pilot had (reportedly) not seen the PA28 safety had not been assured as he overtook it.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A non-sighting by the MCRO1 pilot.

Degree of Risk: B.

AIRPROX REPORT No 2009-034

AIRPROX REPORT NO 2009-034

Date/Time: 24 April 1700

Position: 5351N 00210W (7nm NNW of Pole Hill VOR)

Airspace: Airway (Class: A)
Reporting Ac Reported Ac

Type: JS41 B737-300

Operator: CAT CAT

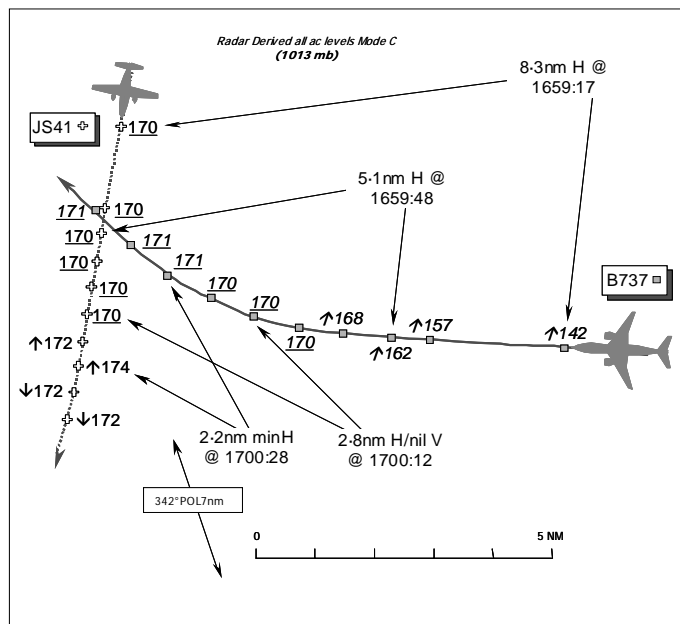
Alt/FL: FL170 FL168

Weather VMC CLAC VMC NK

Visibility: 10nm NK

Reported Separation:
Not seen NR

Recorded Separation:
300ft V @ 2.2nm min H
Nil V @ 2.8nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE JS41 PILOT reports that he was outbound from Newcastle to Birmingham under IFR and in receipt of a RCS from Manchester ACC. Flying in VMC some 1000ft clear above cloud at FL170 in a level cruise at 210kt, southbound in the vicinity of POLE HILL, TCAS enunciated a TA followed by an RA to CLIMB. In compliance with the RA instruction his ac was climbed at a RoC of some 1200-1500ft/min to FL174 whereupon CLEAR OF CONFLICT was enunciated so they returned to FL170. He believed that the pilot of the other ac reported visual with his JS41 but they did not see the B737 themselves. The Risk was assessed as "low".

THE B737-300 PILOT reports he was outbound under IFR from Leeds-Bradford Airport (LBA) enroute to Belfast Aldergrove and cleared by Manchester CONTROL to climb to FL180 in VMC under a RCS. Approaching a position 6½nm N of POLE HILL [Lat & Long given] heading 270° at 270kt climbing through FL165 at a RoC of 3100ft/min they were instructed by ATC to "stop climb FL160". He – the PF - selected 'ALT HOLD' immediately at FL168 and the ac ballooned through and levelled at FL170. ATC immediately issued an avoiding action R turn onto N, which was executed at once. During the manoeuvre he noted conflicting traffic on TCAS at the same level - FL170 – in their 12 o'clock position just under 5nm away. He reported that the other ac was not seen visually – just on their TCAS. Although he considered the conflict of medium risk they received neither a TCAS TA nor RA.

In his view, he believed that any conflict was caused by a very late call from ATC to level off, creating more of a risk than was already present, as they were climbing rapidly through another ac's level at the time.

UKAB Note (1): The MACC RT transcript reflects that the B737 pilot transmitted just after 1700:00, "...we're visual". However, in a subsequent telephone conversation with UKAB Staff to resolve this anomaly, the B737 P-i-C explained that he does not believe that he had seen the JS41 visually and was reporting to ATC that they had the JS41 displayed to them on TCAS. Moreover, he reaffirmed that a TCAS RA was not enunciated during this occurrence.

THE MACC NORTH COMBINED UPPER AND LOWER SECTOR TACTICAL CONTROLLER (N TAC) provided a very frank account reporting that the B737 was outbound from LBA under a RCS routeing towards W2D and had been given a climb to FL180 on a vector of 270°. The JS41 was under a RCS but 'own navigation' southbound to the MCT at FL170. As he was handing over the Sector to the oncoming controller, the conflicting JS41 at FL170 was pointed out to him and so he immediately stopped the climb of the B737 and issued avoiding action of a R turn onto N so that the B737 would pass astern of the JS41. The pilot of the B737 reported he was visual with the

JS41. Traffic information was given to the crew of the JS41 who advised that a TCAS RA had been received. The conflict occurred in Class A CAS and prescribed separation was eroded to 2.65nm at the same level.

ATSI reports that MACC N TAC had been in position for thirty minutes prior to the Airprox. At the time, the MACC N UPPER and LOWER Sectors were combined. The controller did not consider the band-boxing of the Sectors to be a causal factor to the incident, describing his workload as moderate and manageable. The controller had only very recently achieved a Certificate of Competence for the North Sector.

The JS41 crew established communication with the N TAC at 1641, reporting passing FL110 climbing to FL150 and heading 195°. The flight was routeing southbound on Airway P18, via GASKO, POLE HILL (POL) and MANCHESTER (MCT). The Tactical Controller instructed it to climb to FL170. Approximately 2min later, the JS41 crew was instructed to turn L heading 190°. No further communication occurred with the flight until the Airprox occurred some 15min later.

At 1655, the B737 crew made its initial call on the North Sector frequency, having just departed from Leeds Airport on a FIWUD2X SID. This routeing involves a R turn from RW14, passing N of POL and establishing on a westbound track to FIWUD, climbing to 5000ft. The flight was instructed to head 295° and shortly afterwards to climb to FL90. At 1657, the pilot was advised there was no ATC speed restriction and cleared to climb to FL140. This clearance took into account a Manchester inbound from the N which was descending to FL150. At the time, the B737 was passing 5.1nm S of Leeds Airport. N TAC then turned his attention to traffic elsewhere in the Sector until, at 1658:26, he instructed the B737 crew to *“turn left heading 2-7-0 degrees climb Flight Level 1-8-0”*. The radar photograph shows the B737 passing FL110 with the JS41, maintaining FL170, in its 12 o'clock - 14.2nm away. The controller confirmed he had overlooked the presence of the JS41, at FL170, when instructing the B737 crew to climb to FL180. He explained he was concentrating on separating the B737 from the previously mentioned inbound traffic descending to FL150. This ac was heading SE, passing FL191, 54nm NW of the B737. The controller confirmed that the appropriate fps for the subject ac were in position on the display.

At around this time, a handover of the Sector commenced. The oncoming controller noticed the confliction between the subject ac and informed the current N TAC controller accordingly, suggesting he stop the climb of the B737. Consequently, at 1659:50, the controller instructed the B737 crew to *“stop the climb imm- immediately Flight Level 1-6-0”*. The pilot read back the instruction. The Great Dun Fell radar recording timed at 1659:48 shows the B737 passing FL162 with the JS41 still in its 12 o'clock at a distance of 5.1nm. It was reported that STCA activated. Observing straight away that the B737, due to its rate of climb, had passed FL160 [indicating FL162 Mode C], the controller continued at 1700:00 *“it's avoiding action turn right immediately heading north traffic is in your 12 o'clock range of 5 miles”*. The pilot replied *“Right heading north [C/S] we're visual”*. Traffic information was then issued to the JS41 crew *“traffic in your left 9 o'clock range of 4 miles same level turning north”*. The pilot responded *“Resolution Advisory”* and shortly afterwards asked *“are we clear to descend back to 1-7-0”*. This was approved at 1700:30. The B737 crew, which had stopped their climb at FL170, then requested if it was to maintain that level. The flight was instructed to climb to FL180. The oncoming controller then took over the position and routed the B737 direct to FIWUD.

The radar photographs of the event at 1700:12 show both ac at FL170, when they are 2.8nm apart. At this stage, the JS41 has just passed through the B737's 12 o'clock. Thereafter, the B737 makes its avoiding action turn and the former starts to climb in reaction to its RA. The distance between the aircraft reduces to 2.3nm, with the JS41 at FL172 and the B737 at FL170. The CPA occurs shortly afterwards, at 1700:28, when the ac are 2.2nm apart: the JS41 is at its highest level, FL174, whilst the B737 is at FL171. Because of the position of the Airprox, the required radar separation was 5nm. Subsequently, the 2 ac remain on deconflicting tracks as they return to their original cleared levels.

In summary, the MACC N TAC controller overlooked the presence of the JS41, at FL170, when he instructed the B737 to climb through its level to FL180. Prior to STCA activating, the offgoing controller was warned about the confliction by the oncoming controller, as the Sector was being handed over. As a result of this controller's suggestion, the MACC N TAC instructed the B737 crew to stop their climb at FL160. Although the B737 was just below FL160 at the time, understandably its rate of climb resulted in the ac climbing through this level. As soon as the controller realised that the B737 had climbed through FL160, he issued an avoiding action turn. The B737 crew stopped at the same level as the JS41 - FL170 - resulting in this aircraft receiving a TCAS RA which, combined with the avoiding action turn issued by the controller to the B737, resolved the confliction.

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UKAB Note (2): As a result of the B737 pilot's assertion that no TCAS RA was enunciated although the JS41 crew received a TCAS CLIMB RA, NATS Ltd were requested to run an InCAS TCAS Simulation.

A simulation was first conducted with single source radar track data from the Debden Radar: this indicates that at 1659:53, the JS41 crew received a TA while at FL169. At the same time the simulation indicates that the B737 also received a TA while at FL167. At 1700:05 the JS41 was issued with a 'CLIMB' RA. At this same instance the simulation suggests that the B737 was issued with a 'DESCEND' RA. At 17:00:24 both aircraft were issued with 'CLEAR OF CONFLICT' messages. No further alerts were revealed by InCAS in this encounter simulation.

The ATM Safety Monitoring Tool (ASMT) records down-linked TCAS RA messages extracted from Mode-S data. In this encounter the ASMT recorded a 'CLIMB' RA from the JS41 that was detected by; Claxby, Debden and Clee Hill Radars. However, the ASMT did not record any down-linked RA messages from the B737; indicating that the B737 did not receive any RAs during this encounter. It should be noted that Mode-S messages from the B737 indicate that the airframe had a TCAS unit that was fitted, operating and capable of generating RAs. Additionally, the down-linked RA information from the JS41 indicates that there was no RA coordination between the JS41 and the B737.

A second InCAS simulation, conducted using Claxby single source radar, generated no RAs for either ac in this encounter. Analysis of the 'ACAS diagnostics' for the Claxby simulation implied that the RAs for both aircraft were suppressed - possibly by the 'Miss Distance Filter' (MDF). The Miss Distance Filter is designed to reduce nuisance RAs when the distance at the CPA is greater than 40% of the normal separation (5nm). Based on the above evidence it could be contended that the criteria for the Miss Distance Filter to suppress an RA were met onboard the B737, but not onboard the JS41 – hence the generation of the CLIMB RA – that was also confirmed by the downlinked messages.

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 and a TCAS simulation report, together with reports from the air traffic controller involved and the appropriate ATC authority.

It was readily apparent from the controller's account and the comprehensive report from ATSI that the off-going MACC N TAC controller had overlooked the presence of the JS41 at FL170 when he issued the instruction to the B737 crew to climb to FL180, some 2min before the CPA occurred. Thus it was fortunate that the oncoming controller had detected the conflict during the hand-over of the position, before either the STCA warned of the conflict or TCAS generated an RA in the JS41 cockpit. An experienced controller Member highlighted that controllers must be particularly on their guard against errors during the periods leading up to, during, or immediately after the handover of an operational position, and it was clear that Human Factors were significant in this occurrence. It seemed that N TAC had been distracted by the potential conflict with other traffic further to the NW when he cleared the B737 crew to climb to FL180. Members recognised that another opportunity was lost to forestall the Airprox when the crew read-back their cleared level of FL180, but evidently this cue was insufficient to highlight the conflict to the controller at the time. Thus the Board concluded that the cause of this Airprox had been that MACC N TAC overlooked the presence of the JS41 when he climbed the B737 to FL180.

The JS41 pilot was complying with the controller's instructions by maintaining a level cruise at FL170 when his ac's TCAS highlighted the presence of the B737 climbing below him, issued the TA and, having then determined the potential for a conflict, demanded a CLIMB. Once the conflict had been pointed out by his colleague, N TAC reacted swiftly with his instruction to "stop the climb..immediately Flight Level 1-6-0". Although the B737 pilot had suggested in his report that it might have been better to have maintained the climb, that is what TCAS demanded of the JS41's crew moments later. Whether the TCAS logic would then have reversed the sense of the RA was unclear, but it seems likely that a descent by the JS41 would have ensued had the B737 continued to climb. When assessing the 'Risk', Members could only base their conclusions on what actually happened and not what might have occurred if circumstances had been somewhat different. As it was, the B737 reports that he immediately complied with the first part of the instruction, initiated an 'ALT HOLD' and levelled his ac, which the radar recording reflected was at FL170/171. Recognising that the controller's instruction was issued after the ac had already climbed at a good rate through the prescribed level, the Board debated whether in this instance the B737 pilot should have followed the second part of N TAC's instruction by descending to FL160. Controller Members opined that they would have expected the pilot to do just that, whilst some CAT pilot Members believed that the stop climb

was the first action called for and, with the avoiding action turn instruction following a mere 10sec later, the B737 crew had little opportunity to do anything more. On balance, the Board agreed that in the absence of any TCAS RA, compliance with the avoiding action turn was the priority, to turn the B737 out of the way of the JS41. In the event the ac did not fly into close proximity, with the N TAC's avoiding action R turn instruction and the B737 crew's prompt compliance contributing to the minimum horizontal separation distance of 2.2nm. .

Whilst this Airprox illustrated the value of TCAS the absence of a co-ordinated RA in the B737 was somewhat unexpected. That the B737 pilot had not visually acquired the JS41 and had only received a TA could have had a bearing on the perceived risk. The results from the ANSP's analysis of the TCAS simulation were not clear-cut. However, the Board recognised the value of the recorded downlinked Mode S data here, as the ASMT had shown that no RA's were downlinked by the B737's Mode S and no 'co-ordination' took place between the acs' respective TCAS equipments. The apparent anomaly between the TCAS warnings in each ac was explained by referring to the TCAS Miss Distance Filter logic; the B737's TCAS had determined that it would pass sufficiently far astern of the JS41 that the RA could be inhibited. Thus, at the geometry illustrated here, it had been shown that it was quite feasible for an RA to be triggered in one ac but not in another if certain parameters were met. Weighing all these factors together the Members agreed unanimously that the combined avoiding action generated by the controller and TCAS in this situation had effectively removed any Risk of a collision.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The MACC N TAC controller overlooked the presence of the JS41 when he climbed the B737 to FL180.

Degree of Risk: C.

AIRPROX REPORT No 2009-035

AIRPROX REPORT NO 2009-035

Date/Time: 6 May 0941

Position: 5203N 00209W (½nm SSW of Strensham HLS - elev: 82ft)

Airspace: FIR/LFA4 (Class: G)

Reporting Ac Reported Ac

Type: EC135 Hawk

Operator: Civ Amb HQ AIR Trg

Alt/FL: 550ft 250ft

RadAlt msd

Weather VMC CLBC VMC CLBC

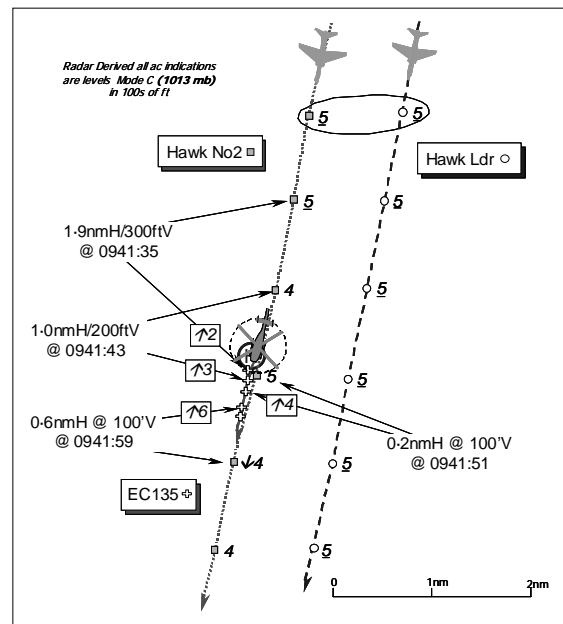
Visibility: 30km >10km

Reported Separation:

200ft V/300m H 50ft V/30m H

Recorded Separation:

Nil V @ ~140m H track displacement



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE EC135 HELICOPTER PILOT reports that after lifting at 0940 he was departing from Strensham Heliport (HLS) at 95kt under VFR on a HEMS mission in VMC some 1200ft below cloud. A squawk of A0020 was selected with Mode C but neither TCAS nor any other form of CWS is fitted.

On climb-out, passing 550ft RadAlt, heading approximately 215°(M), a single black Hawk jet was first seen at 11 o'clock about 300m away after it had passed beneath his helicopter slightly offset down their port side on a similar heading. This occurred at 0942 – some 2min after take-off - and he assessed the Risk of a collision as “high”. No avoiding action was taken as the jet had already passed by when first spotted. In his view the separation was very difficult to ascertain because of the high speed of the encounter but he estimated that vertical separation was about 200ft and horizontal around 300m. When spotted, the conflicting Hawk appeared to be flying straight and level and so had presumably directly over-flown Strensham moments earlier. A second Hawk was spotted further to the SE but was not a conflict. Because of their position and height he was not in communication with any ATSU at the time of the Airprox. His helicopter is coloured red/yellow; the 2 landing lights, white HISLs and position lights were all on.

THE HAWK PILOT, a QFI, reports he was operating under VFR as No2 of a pair of black Hawk jets conducting evasion training at low-level in VMC. A squawk of A7001 was selected with Mode C on but neither TCAS nor any other form of CWS is fitted. The formation was not in receipt of an ATS but listening out both on discrete UHF & VHF frequencies.

Flying level at 250ft msd approaching a position 52°04.97'N 002°07.04'W [the Airprox occurred about ½nm SSW of Strensham] heading 187° at 420kt, at a range of about ¼nm the student pilot in the front seat took avoiding action to prevent a collision with the stern of an air ambulance helicopter. Executing a late descent/bunt they passed 50ft beneath and overtook the helicopter to port by an estimated 30m/100ft with a “very high” risk of collision. Although conducting “a lot of look out” because it was an evasion sortie, this late sighting of the yellow air ambulance was attributed to the relative aspect of the helicopter and high closure rate.

UKAB Note (1): The recorded Cleve Hill SSR data illustrates this Airprox relatively clearly: the Hawk pair is shown squawking A7001 about 1nm apart in wide battle formation, southbound approaching the Airprox location - ½ nm SSW of Strensham – both jets indicating 500ft unverified Mode C (1013mb), which equates broadly to an altitude of 680ft QNH (1019mb). At 0941:35, the EC135 helicopter is shown as a secondary contact climbing through 200ft unverified Mode C (1013mb) – about 380ft QNH (1019mb) - directly in the 12 o'clock of the contact perceived to

be the No2 Hawk at a range of 1.9nm, itself shown at 500ft Mode C. The Hawk pair maintain a steady course throughout as the EC135 climbs further through 400ft Mode C at 0941:51, closing in the Hawk No2's R 12:30 position to a range of 0.2nm, some 100ft below the indicated level of the jet; this is probably the point at which the student PF spotted the helicopter. The CPA occurs in between radar sweeps as the No2 Hawk's projected track passes in the order of 140m to port of the EC135 which, on the next sweep timed at 0941:59, indicates 600ft Mode C, some 200ft above the No2 Hawk which itself has descended 100ft to 400ft indicated Mode C thereby replicating the Hawk QFI's account of the avoiding action bunt executed by the No2 Hawk student PF. The No2 Hawk then opens ahead of the EC135 maintaining 400ft Mode C. The absence of primary radar data to support the SSR positional information must be borne in mind when considering the minimum horizontal separation reflected here of less than 0.1nm.

UKAB Note (2): The Military LFH at Part 1-2-4-5 promulgates within the LFA4 Section brief for military aircrews, Strensham HLS (HA03) as a warning only. Therefore, no specific mandatory avoidance criteria is specified.

MOD LOW FLYING OPS comments that the low volume of traffic using Strensham dictates that it be given 'Warning' status only. It is unfortunate that the congested nature of the low-level airspace in the UK prevents most helicopter and light aircraft sites being awarded avoidance criteria. If they were awarded a statutory avoidance, the remaining airspace would become more congested by de-fault. Nonetheless, Strensham is a notified Police, Ambulance and Mountain Rescue pick-up site and short notice increased activity can be expected. In these instances, the requirement for permanent avoid status will be considered on a site-by-site basis. LFOS will re-visit the situation at Strensham with DAS Lower Airspace (LA).

HQ AIR (TRG) comments that this encounter occurred in a see and avoid environment and as the Hawks were approaching the EC135 from behind it made them very difficult for the EC135 pilot to see them. Likewise to visually acquire a small helicopter from its rear profile is difficult and the No2 Hawk student pilot did well to spot the EC135 with sufficient time to take effective avoiding action.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It seemed to the Members that at the significant speed differential evident here, the EC135 pilot would have been wholly unable to sight the two Hawk jets before take-off from the HLS at Strensham. Moreover, from the geometry of this Airprox as replicated by the recorded Clee Hill SSR data, the helicopter pilot would have been unaware of the presence of the jets before the No2 Hawk overtook his EC135 to port and some 200ft beneath his ac, as he reported. From the EC135 pilot's perspective, the No2 Hawk passed about 300m to port, which was about twice that indicated by the radar data and significantly more than that reported by the Hawk QFI. Nevertheless, it was clear to the Board that the EC135 pilot had no influence on the eventual outcome of this close quarter's encounter in Class G airspace whatsoever.

In the other cockpit it was fortunate that the Student pilot in the No2 Hawk saw the brightly coloured air ambulance when he did - at a range of ¼nm it was reported - and managed to descend below the climbing helicopter: the Board commended the Student pilot for his prompt and decisive action. The small size of the helicopter at a tail-on aspect coupled with the constant relative bearing and the added complication of the ac climbing up into the Hawk Student pilot's field of view from below, possibly masked by the jet's nose, would have added to the difficulties of sighting the helicopter in this situation. The pilot Member from HQ Air (Trg) emphasised that the Hawk instructor pilot would have been entirely unsighted on the threat from below beforehand because of his position in the rear-seat. However, fast-jet pilot Members commented on the intra-formation look-out responsibilities and emphasised that the pilots in the No1 Hawk who would have had a look-out role to starboard. In this situation the Board agreed a form of TCAS or CWS (albeit that the former is not specifically designed to operate in the low-level environment) to highlight the presence of the EC135 would have been helpful to the Hawk formation pilots. It was explained that following previous work a review is in hand regarding the fitment of such a device to the Hawk T Mk1, the HQ Air (Trg) pilot Member adding that TCAS would have been equally beneficial to the EC135 pilot. Nevertheless, it would seem that none of the other formation pilots were able to spot the presence of the helicopter before the Student spotted it at a late stage and took effective avoiding action by rapidly descending his jet, in the Board's view, just in time. Thus the Members agreed unanimously that the Cause of this Airprox was a late sighting by the Hawk formation pilots.

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Here the No2 Hawk QFI's account had estimated that his Student's bunt had achieved 50ft of vertical separation as the helicopter passed 30m to starboard. Whilst the Clee Hill SSR data suggested the ac involved were potentially further apart, plainly the No2 Hawk crew would have had a better view of the encounter as they flew past the helicopter in their nimble jet. It was suggested to the Board that in the absence of primary radar data, at the ranges involved here, the estimate from the pilot's account was probably nearer the mark and there was certainly no reason to doubt the veracity of the Hawk QFI's report. Thus with helicopter climbing up through the level of the Hawk as the latter approached from astern it was indeed fortunate that the Student spotted the helicopter when he did, managed to effect his avoiding action so promptly and achieve what separation there was. Whilst in the Board's view the Student pilot had done enough to avert an actual risk of collision, the Hawk QFI himself had stated that the Risk was "*very high*". The Board agreed unanimously that the safety of the two ac involved had certainly been compromised in the circumstances conscientiously reported here.

The absence of a mandatory LFS avoidance for the HLS at Strensham in order to provide some level of protection to the HELMS helicopters in the critical stages of take-off and landing was noted by the Members who were aware of previous Airprox in the vicinity of this HLS. Hawk crews could quite legitimately fly through this Class G airspace taking due regard to the nature of the warning about the HLS promulgated in the LFH. The complexity of Class G airspace, which results in military training routes traversing this vicinity, was explained by the LF Ops Advisor, the key being to keep the airspace as 'open' as possible for all airspace users. Nonetheless, some other military Units had elected to plan their flights so as to avoid this promulgated HLS. Whilst some would reasonably contend that the level of operations from Strensham HLS did not warrant an ATZ – that would, in all probability, attract the establishment of a LFS mandatory avoid for military crews - it was apparent from the comments by MOD LF Ops that Strensham is used as a Police, Ambulance and Mountain Rescue pick-up site, with all that this entails in terms of increased activity. However, Members were encouraged by the LF Ops initiative to re-visit the situation at Strensham with DAS LA and agreed, in light of this close quarters encounter, that a re-examination of the requirement for a permanent avoid status for Strensham HLS was warranted.

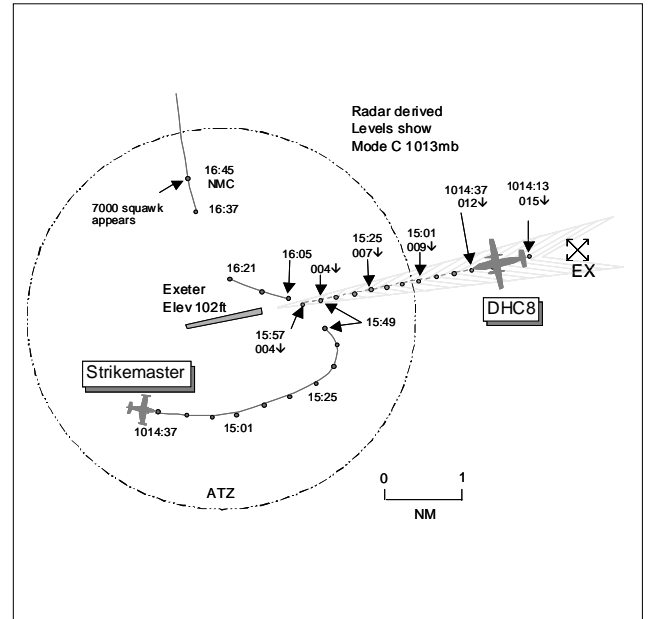
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A late sighting by the Hawk formation pilots.

Degree of Risk: B.

AIRPROX REPORT NO 2009-036

Date/Time: 8 May 1016
Position: 5044N 00323W (1nm FIN APP RW26
 Exeter - elev 102ft)
Airspace: ATZ (Class: G)
Reporting Ac Reported Ac
Type: DHC8 BAC167
 Strikemaster
Operator: CAT Civ Club
Alt/FL: 800ft↓ 1000ft
 (QNH 1011mb) (QFE)
Weather VMC CLBC VMC CLOC
Visibility: 10km >40km
Reported Separation:
 500ft V/0.5nm H 800ft V
Recorded Separation:
 NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE DHC8 PILOT reports inbound to Exeter IFR and in receipt of Aerodrome Control Service from Tower on 119.8MHz squawking Mode S and C. Whilst heading 260° at 120kt on the ILS RW26 they were informed by ATC of traffic LH downwind. At this point the Capt reported he thought he had the traffic visual, about 4-5nm away, although he did observe 2 ac on TCAS. The ac which the Capt reported visual with, a low wing small jet coloured white/red, continued downwind and then turned towards their ac and started to descend. It continued towards them and turned towards final approach at which stage its pilot reported going around and it climbed away within 0.5nm of them and above them. The FO, the PF, noted the TCAS show a TA symbol as the other ac passed 500-600ft above. He assessed the risk as medium to high in the event of them having to go-around and at a time when the PNF was having to continuously monitor other ac whilst on final approach in gusty Wx conditions.

THE STRIKEMASTER PILOT reports outbound from Exeter to Lyneham VFR and in receipt of a BS from Exeter Tower on 119.8MHz squawking 7000 with Mode C, he thought. The visibility was >40km in VMC and the ac was desert camouflage in colour and strobe lights were switched on. During a visual cct heading 060° at 130kt and 1000ft QFE he called 'downwind' to overshoot and was given TI on a DHC8 on 3nm final, which he saw and reported 'visual'. At the end of the downwind leg he carried out a level go-around onto the deadside remaining visual with the DHC8 at all times. During this manoeuvre he flew directly above the DHC8, which was at about 0.5nm final and 150ft agl, separation estimated to be about 850ft. Once the ac had been cleaned-up and was positioned on the deadside he departed the cct to the N. He assessed the risk as nil.

THE EXETER ADC reports the DHC8 was on an ILS approach to RW26 whilst the Strikemaster was making a LH visual cct to the same RW. When the Strikemaster was downwind he asked the pilot to confirm he was visual with the DHC8 on 3nm final which he did. He instructed the Strikemaster pilot to report final and gave the appropriate wake turbulence information as well as advising the DHC8 crew of the Strikemaster's position. The Strikemaster turned onto L base and as it appeared to be high and close (i.e. not making an approach) he asked if the flight was departing en route to Lyneham which the pilot confirmed. The Strikemaster flew close to the DHC8 and positioned onto the deadside and then departed to the NE. No report of an Airprox was made on the RT but the DHC8 Capt subsequently informed the DSATCO that a report would be filed.

The Exeter METAR shows EGTE 080950Z 26020G30KT 230V300 9999 SCT030 12/03 Q1011=

ATSI reports that the Strikemaster flight was cleared for take off from RW26 just after 1012:30. The pilot then requested to remain for 1 cct before departing VFR to the N (to Lyneham). He was advised to "expect a VFR left

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hand circuit". The DHC8 flight, an IFR inbound, reported fully established at 6nm and was instructed to continue its approach with an ac to depart. Shortly afterwards, the crew was cleared to land.

When the pilot of the Strikemaster reported downwind to overshoot, just after 1014:30, he confirmed he was visual with the DHC8 on a 3nm final. He was instructed to *"report final number two follow the Dash Eight caution wake turbulence recommended spacing four miles"*. The pilot acknowledged the call using his c/s. The crew of the DHC8 was informed at 1015:00 *"traffic is a Strikemaster late downwind left hand to report final behind you"*. He responded *"think I have him in sight"*. The controller reported observing the Strikemaster turning on to base leg and positioning on to the deadside. He asked the pilot if he was departing to Lyneham now. This was confirmed and the flight was, subsequently, transferred to the Radar Controller.

The controller acted in accordance with the responsibilities stated in MATS Part 1, Section 2, Chapter 1: *'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'*.

UKAB Note (1): The Burrington radar recording at 1014:13 shows the DHC8 established on the Exeter RW26 FAT at 3.5nm from touchdown descending through FL015 (1440ft QNH 1011mb). Twenty-four sec later the Strikemaster appears for the first time as a primary only radar return 1.4nm SW of Exeter downwind LH for RW26 by which time the DHC8 is 2.75nm from touchdown. When the DHC8 crew was given TI on the Strikemaster at 1015:00 the radar shows the DHC8 descending through FL009 (840ft QNH) and 2.9nm distant from it. The Strikemaster commences a L turn onto base leg just after 1015:25 when 1.3nm SSW of the DHC8 indicating FL007 (640ft QNH). As the subject ac close, the Strikemaster fades for 1 radar sweep. The return before at 1015:49 shows the Strikemaster turning through a NW'ly heading 0.4nm S of the DHC8 which is at FL004 (340ft QNH). During the loss of radar contact the DHC8 paints for the last time 8sec later approximately 0.5nm from touchdown still indicating FL004 (340ft QNH). The Strikemaster appears on the next sweep 0.4nm ENE of the RW26 threshold, just N of the FAT, on a WNW'ly track. This track is maintained for 2 further sweeps before it yet again fades for 1 sweep, reappearing at 1016:37 1.4nm N of Exeter tracking N. Eight sec later a co-located 7000 squawk appears with the primary return on the Strikemaster showing NMC. During the encounter and at the CPA, not captured by the recorded radar, the Strikemaster pilot reported carrying out a level turn at 1000ft QFE (c1100ft QNH).

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It appeared to Members that the Strikemaster pilot was flying a military type cct. When he was instructed to position No 2 to the DHC8 and informed of the recommended wake turbulence spacing, the pilot elected to go-around from the position at which he would normally commence his final turn, rather than extending downwind. This is SOP for ac flying at military aerodromes where pilots fly regular shaped cct patterns and where any extension to the cct size is carried out upwind; rather than extend downwind, a level go-around is carried out onto the deadside from where integration is commenced back into the visual cct. Military ATC inform crews of the traffic situation and it is the pilot's responsibility to position his ac accordingly into the sequence. During his go-around, the Strikemaster pilot overflew the DHC8, which was on short final for landing, and positioned onto the deadside prior to setting course for Lyneham. Pilot Members could understand the DHC8 crew's concern. There was a gusty wind and the DHC8 crew were required to establish a stable final approach by 500ft, or go around; had a go-around been necessary, the Strikemaster's flight path was in potential conflict. Members agreed that, since ATC instructions were mandatory in the Exeter ATZ, the Strikemaster pilot should have informed ATC of his intentions and requested approval. By electing not to follow the DHC8, but to go around from the base leg, the Strikemaster pilot did not comply with ATC instructions and his flight path caused the DHC8 crew concern. This was the cause of the Airprox. In their responses to ATC, the DHC8 crew and the Strikemaster pilot had both declared that they were visual with each other. Although the DHC8 crew were concerned during the latter stages of the approach, the Strikemaster pilot was always in a position to manoeuvre his ac further away, if necessary, which led the Board to conclude that any risk of collision had been effectively removed.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Strikemaster pilot did not comply with ATC instructions and his flightpath caused the DHC8 crew concern.

Degree of Risk: C.

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AIRPROX REPORT NO 2009-037

Date/Time: 13 May 0708

Position: 5902N 00246W (Between SUM and KWL)

Airspace: Scottish FIR (Class: G)

Reporting Ac Reported Ac

Type: SF340B JS31

Operator: CAT CAT

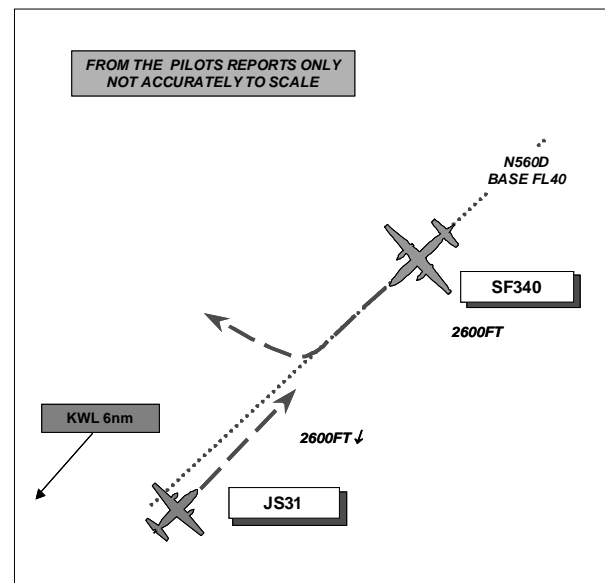
Alt/FL: 2600ft 2600ft
(QNH 1028mb) (QNH 1028mb)

Weather VMC NR VMC NR

Visibility: 10km 40km

Reported Separation:
NR 200ft V/0.5m H

Recorded Separation:
NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE SF340B PILOT reports they were inbound to Kirkwall tracking 225° on the 'N560D airway' (*sic*) between SUM and KWL. They were in good VMC, level at 2600ft (which is also MSA) on the QNH of 1028mb, and in two-way contact with Kirkwall TWR.

A Jetstream departed from Kirkwall tracking Northerly towards Sumburgh and an Islander was also in the vicinity. They were monitoring both ac on TCAS and also looking out. He acquired (visually) the Jetstream at a distance of about 3-4nm directly ahead of them and about 2-300ft below so immediately turned 90° right to avoid it and on passing through about heading 290° they received an ACAS climb RA. He was flying in good VMC and was visual with the ac passing down his left hand side so he ignored the RA instructions, as he believed it was the correct thing to do. ATC informed him what had happened and an uneventful visual approach to RW09 at Kirkwall was carried out.

He contacted ATC later who advised him that they had been cleared to 3600ft QNH and not to 2600ft, despite both crew believing that it was 2600ft and recording 2600ft on the PLOG. ATC advised them that their ATC transmission was weak and they had problems before with misunderstanding between No's 1 and 2.

They requested ATC to review the RT tapes and pulled the CVR CB after landing, but did not assess the risk.

THE JS31 PILOT reports after departure from Kirkwall RWY09 they were instructed to proceed on a direct track to Sumburgh with an alt restriction of 2600ft. After establishing at 2600ft on the direct track they had a TCAS TA against a SF340 coming from the N at around 9nm from the airfield and maintaining the same level. ATC asked the crew of the other ac if they were aware of them and they replied '*negative*'. They then had an RA descend so they started to manoeuvre the ac while confirming visually that they were clear of the other ac. On clearing it they recovered to their cleared alt and reported the incident to ATC on the frequency in use. He assessed the risk as being Medium.

After arriving at Sumburgh they contacted Kirkwall ATC by telephone and apparently the traffic descending from the North was cleared only to 3600ft.

ATSI reports that this incident occurred in Class G airspace, outside the limits of the Kirkwall ATZ (radius 2nm, vertical limit 2000ft aal) and ADR N560D (the base is FL40 to the N of KWL). Both ac were receiving a Procedural Service from the Kirkwall Approach/Aerodrome Controller. The MATS Part 1, Section 1, Paragraph 6, defines a Procedural Service:

'A Procedural Service is an ATS where, in addition to the provisions of a Basic Service, the controller provides vertical, lateral, longitudinal and time instructions, which if complied with, shall achieve deconfliction minima against other ac participating in the Procedural Service. A controller shall provide deconfliction instructions by allocating levels, radials, tracks, and time restrictions, or use pilot position reports, aimed at achieving a planned deconfliction minima from other ac to which the controller is providing a Procedural Service in Class F/G airspace'.

On this occasion, the controller was intending to use the vertical minima of 1000ft until the subject ac had reported passing each other.

The RW in use at Kirkwall was 09. The JS31 requested taxi clearance for its flight to Sumburgh at 0701. They were instructed to route along RW33 and to hold at R1 i.e. clear of RW09/27. Shortly afterwards, an Islander on a VFR flight to Sanday was cleared for take-off from RW09 and, when this had departed, the JS31 was instructed to backtrack RW09 for line-up. Meanwhile, while the JS31 was at R1, the SF340, inbound from Sumburgh, established communication with Aerodrome/Approach Control at 0702, reporting descending to FL40. The controller confirmed the weather information and instructed the pilot to *"descend to altitude Three Thousand Six Hundred feet QNH One Zero Two Eight"*. The pilot responded *"Two Thousand feet Two Thousand Six Hundred feet One Zero Two Eight (C/S)"*.

The MATS Part 1, Appendix E, states that 'Errors in a read-back must be corrected by the controller until the pilot gives an accurate read back'. However, the controller believed that the pilot had read back the cleared altitude correctly. Additionally, a trainee was also plugged in with the controller and listening to the frequency; he also did not realise that there had been an incorrect read-back. Although the frequency is also broadcast via a loudspeaker the controller confirmed that both controllers were wearing headsets at the time. The RTF recording reveals that the descent clearance to 3600ft was issued clearly, albeit the controller did not use the correct pronunciation for three as stated in MATS Part 1/CAP413: 'tree'. During the incident period, the quality of the SF340's transmissions was poor. Closely listening to the recording confirmed that the pilot did read back 2600ft even though the first mention of 2000ft in the reply was not clear.

The SF340 was then *"cleared to the Kilo Whiskey Lima report visual for runway Zero Nine there will shortly be a Jetstream departing opposite direction and there is an Islander just airborne VFR on a Basic Service to Sanday"*. The pilot asked if the message was for him. The controller continued *"Yes it was clear to the Kilo Whiskey Lima report visual for Zero Nine Jetstream shortly departing opposite direction also an Islander outbound VFR on a Basic to Sanday"*. The pilot replied *"Kilo Whiskey Lima call you visual and traffic copied thanks"*.

The JS31 flight was issued with its clearance to Sumburgh via N560D to climb to maintain FL70. Once the clearance had been read back correctly, a local restriction, to provide the vertical separation as detailed above, was issued *"local restriction after departure on track climb maintain altitude Two Thousand Six Hundred feet One Zero Two Eight there is a SAAB Three Forty opposite direction Three Thousand Six Hundred"*. The pilot read the restriction back correctly and after TI was issued about the Islander, the JS31 was cleared for take off from RW 09 at 0705.

The SF340 pilot reported their range as being 14nm at 0707 and he was informed *"the Jetstream's in the left turn now report if you get the traffic in sight"*. Approximately 30sec later the SF340 pilot reported *"we are visual with the airfield requesting visual approach for Zero Nine"*, the controller asked *"Are you visual with the departing Jetstream opposite direction"* and the pilot replied *"negative...on TCAS but looking"*; he was asked to report visual and the JS31 pilot was also requested to report visual with the inbound, opposite direction, SAAB.

Starting at 0709:30, the following transmissions were made on the frequency:

SF340 *"Kirkwall (C/S) just er managed to avoid that er Jetstream it's passed us now so I'd like to do ?????? that one and er visual with the airfield"*.

ATC *"(SF34 C/S) roger break (JS31 C/S) can you confirm you've passed the SAAB now"*.

JS31 *"Yeah affirm er we have a er traffic er resolution"*.

ATC *"(SF34 C/S) you are cleared for a visual approach runway Zero Nine report left base"*.

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SF340 *"Clear visual approach er Zero Nine call you left base (C/S)".*

ATC *"(JS31 C/S) climb Flight Level Seven Zero".*

JS31 *"Climb Flight Level Seven Zero (C/S)".*

ATC *"And (JS31 C/S) report your passing level".*

JS31 *"Er we are now leaving Two Thousand Six Hundred feet climbing er".*

ATC *Roger".*

SF340 *"And (C/S) just to let you know there we've er literally near flew into the er the (Airline company) we had to make evasive action to the right we were literally on the same altitude straight out".*

ATC *"Oh roger well you should have been at Thirty-six and the (Airline company) at Twenty-six".*

The controller commented that, although the Transition Altitude at Kirkwall is 3000ft, it is usual practice to use altitudes, rather than Flight Levels, just above this level to ensure that clearances issued provide the vertical separation of 1000ft.

The SF340 pilot believed that he had been cleared to descend to 2600ft rather than 3600ft as cleared. Neither the Kirkwall controller, nor the trainee, detected that the pilot had read back the incorrect altitude. As a result, the subject ac were on opposite direction routes and proceeding to the same altitude causing the confliction.

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

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board determined that, despite the apparent complexity, this incident resulted from a straightforward mishearing by the SF340 crew of the cleared altitude (3600ft), and the Kirkwall Controller not picking up their incorrect readback (2600ft). Bearing this in mind, Members focussed on the quality of the RT transmissions from both the ac and the Tower. In clearing the SF340 to 3600ft, the Kirkwall controller did not use the correct pronunciation of the word 'three' as stated in MATS Part 1/CAP413: 'tree'; however, the pronunciation of 'three' is clear in the recording of this transmission, and other aircraft have not reported any difficulty in the clarity of other transmissions. Conversely, the quality of the transmissions from the SF340 was poor, although it is just possible to hear that the altitude read back was 2600ft. Members agreed that if there had been an RT problem, it was most likely in the SF340. A Controller Member familiar with the area suggested that this was not uncommon with that type of ac and suggested that Controllers working such ac should be vigilant in ensuring that their instructions are correctly read back.

Airline Pilot Members observed that the Jetstream crew had been passed their outbound clearance by ATC **after** the Saab came on frequency at 0702; furthermore, the Saab crew had been passed TI regarding the Jetstream twice (repeated at the request of the pilot), albeit without any mention on either occasion of altitude restriction of 2600ft placed on the Jetstream. On balance however, and notwithstanding possible poor RT reception, bearing in mind that both crews would likely have been familiar with local operations, they considered that the Saab crew's SA had been incomplete.

Members agreed unanimously that the Saab crew's turn away from the Jetstream and the latter's compliance with the TCAS RA had ensured that in this incident there had been little risk of collision; however, it did, in their opinion, demonstrate how a combination of two simple mistakes can lead to a degradation of normal safety standards.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The SF340B crew misheard their cleared altitude and Kirkwall ADC/APP did not detect the incorrect read back.

Degree of Risk: B.

AIRPROX REPORT No 2009-038

AIRPROX REPORT NO 2009-038

Date/Time: 13 May 1559

Position: 5321N 00007W (6½nm NW of OTBED)

Airspace: London FIR (Class: G)

Reporter: Humberside APR

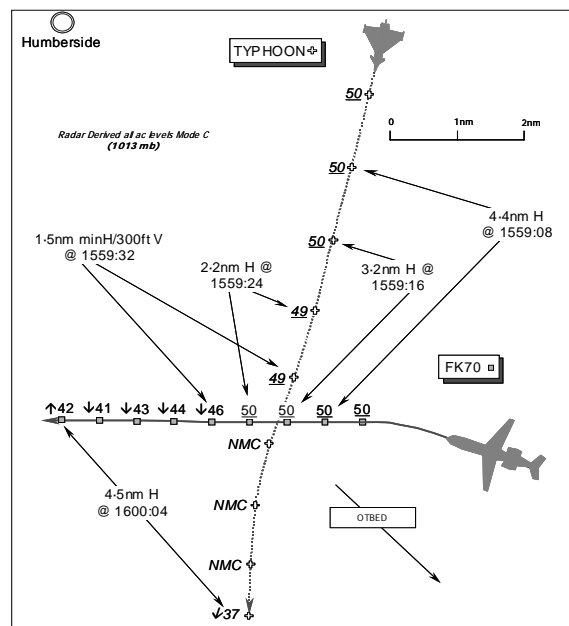
	<u>1st Ac</u>	<u>2nd Ac</u>
<u>Type:</u>	FK70	Typhoon
<u>Operator:</u>	CAT	HQ Air (Ops)
<u>Alt/FL:</u>	↓FL50	FL50
<u>Weather</u>	IMC IICL	VMC CLOC
<u>Visibility:</u>	NR	7nm

Reported Separation:

<u>Humberside APR:</u>	< 1nm/100ft.	
	NR	500ft V/2000m H

Recorded Separation:

300ft V @ 1.5nm minH
Nil V @ 3.2nm H



CONTROLLER REPORTED

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE HUMBERSIDE APPROACH RADAR CONTROLLER (APR) provided a very comprehensive account reporting that the FK70 was operating IFR inbound to Humberside under a DECONFLICTION Service. The ac was heading 300° from OTBED to position for RW02 whilst descending to FL50 against traffic under his control at 3000ft [BARNSELY RPS (1009mb)]. Another aircraft was observed descending on radar which had been tracking southbound at high speed squawking A6152 but then changed squawk to A1751 and levelled at FL50 – the Typhoon. He tried to initiate co-ordination with Coningsby, to take 1000ft vertical separation below the observed Mode C or 3nm horizontally. However, Coningsby had not established 2-way RT contact with the Typhoon but would try to effect the co-ordination he requested. Shortly afterwards, the SSR data on the Typhoon disappeared from his display. An avoiding action turn onto 270° was then issued to the FK70 crew. Traffic information was given and he estimated that prescribed separation was eroded to <1nm/100ft. He did not hear the FK70 crew report executing an RA on RT because he was answering the landline to Coningsby, who informed him that they now had the Typhoon on frequency and that it was at 4000ft BARNSELY RPS. Confirming with the FK70 crew that they had responded to a TCAS RA, which was now complete, he then vectored the FK70 towards R base for an NDB approach to RW02.

Commenting that he was operating under a medium to high workload, he added that the Great Dun Fell SSR was in use with the Humberside ASR because the Claxby SSR was on maintenance.

THE FK70 PILOT reports that they were inbound to Humberside under a DECONFLICTION Service and in receipt of radar vectors for an NDB approach to RW02. Flying in and out of ill-defined cloud layers and IMC when the incident occurred, they were maintaining FL50 flying towards a R BASE position on a radar heading of 300°, when ATC advised that they had traffic in their 12 o'clock position he thought, with no height information and they should turn onto 270° [it was actually reported as “..north of you 6 miles southbound..”]. This they did. There were 2 contacts on their TCAS display screen at this moment, both with White height information; the one at 12 o'clock was on the edge of the 3nm range ring and became a TA with an Amber dot with an aural “TRAFFIC” warning, together with an Amber height readout of 00. Shortly after this, TCAS enunciated a DESCEND RA that was followed. The TCAS ‘Intruder’ square turned red, in their 5 o'clock position with a relative height readout of +01. The RA was successful, and when ‘CLEAR OF CONFLICT’ was enunciated, the AP was re-engaged and they returned to their assigned level of FL50. They were subsequently given descent to 3000ft and were able to continue with a visual approach to RW02, to an uneventful landing.

THE TYPHOON PILOT reports that he was the leader of a pair of Typhoons recovering to Coningsby as singletons under VFR with a TRAFFIC Service from London (Mil) [The No2 recovered first]. After a stepped descent to FL50 instructed by London (Mil), he was in the process of being handed over to Coningsby APPROACH (APP) when he gained AI radar contact with a track in his 12 o'clock at a range of 4nm. Approaching a position about 15nm E of Scampton, heading 190° (M) at 300kt he thought, flying in VMC he soon spotted the Blue and White low-wing twin some 2-3nm away and corrected his flight path. To avoid the FK70 he turned L and initiated a descent to pass 500ft below and 2000m astern of the other ac at the closest point. When he established RT contact with Coningsby he advised them that he had had the traffic in his 12 o'clock visual, despite not having been advised of it by London (Mil). Assessing the Risk as "medium", upon landing a telephone call was made to Coningsby ATC but no reporting action was initiated at that point. During the period of the Airprox he was operating some 5km and 3000ft clear below cloud in VMC and assessed his workload as "low". The HUD tape was not selected 'on' for the recovery. His ac has a grey camouflage scheme but the HISLs were on.

THE CONINGSBY APPROACH CONTROLLER (APP) reports that at about 1545, London (Mil) Assistant15 (Asst15) pre-noted 2 Typhoons for recovery via individual radar to visual approaches – the No2 was recovering first and individual squawks were allocated – the subject lead Typhoon was allocated a squawk of A1751. Some 5min later the No2 was handed over by Console 15 London (Mil) and vectored for RW07RH. By about 1555, he was alone in the ACR with APP, DIR and LARS all bandboxed together but the only traffic he had under control was the No2 Typhoon. Humberside APR then rang requesting co-ordination on traffic 10nm S of OTTRINGHAM (OTR) squawking A1751 – the subject Typhoon – against Humberside's own traffic N of OTBED squawking A4274 [the FK70] but the APR then asked him to standby whilst he responded to an RT call. The APR was overheard on the landline calling the subject Typhoon to his traffic whereupon the line from London (Mil) E rang in the Coningsby ACR. Responding to the APR first, he said that he was not yet working the subject Typhoon but that London (Mil) was on the other line trying to hand it over. Humberside APR then asked him to take 1000ft below their FK70's Mode C. Before he responded he instructed the No2 Typhoon to switch to TOWER and then restated that as he was not yet working the subject lead Typhoon he would not have time to impose the descent and thereby obtain the requisite co-ordinated separation. The Humberside APR then rang-off and he answered the London (Mil) E landline. The subject Typhoon was then handed over under a TRAFFIC Service at 5000ft BARNSELY RPS (1009mb). He rushed the receipt of the hand-over and instructed the London Controller (*sic*) to descend the Typhoon to an altitude of 4000ft for co-ordination, but he did not ask if Console 15 had called the FK70, which was in the Typhoon's 11 o'clock 5nm away at the same level. The Typhoon pilot called on frequency, just as the two radar contacts merged, advising that he was visual with traffic passing down his right-hand side. As the Typhoon was now clear of the confliction the ac was vectored in to RW07RH. He assessed his workload as "light" with 2 ac under control.

LATCC (MIL) CONTROLLER 15 (CON15) reports that he had just completed about 30min training on the ALLOCATOR position before taking over as CON15 and had been on console for about 5min before the Airprox occurred. The Claxby Radar was not available for use and he was operating 2 UHF frequencies with a "high" workload, which included the subject Typhoon descending inbound to Coningsby. Other traffic [not the FK70] had been called under the TRAFFIC Service provided and shortly after acknowledging this traffic information the Typhoon pilot said he was also visual with traffic crossing his nose at 2nm – the FK70. This ac had not been seen on radar until the Typhoon pilot mentioned it as his attention had been focused on another ac under his control. His Assistant – Asst15 – was handing the Typhoon over to Coningsby as this took place and further descent was issued by Coningsby APP. He stressed that he had been unable to check the Claxby Radar for low-level tracks in the area prior to the transfer - as is the normal procedure - because it was offline.

ATSI reports with RT transcript [UKAB Note (1): the Humberside tape recordings only inject a time reference every 30sec] that the FK70 crew established communication with Humberside APPROACH at 1553, reporting descending to FL100. The crew was informed by the APR that the flight was "*..identified 4-0 miles southeast of Humberside Deconfliction Service as you clear controlled airspace and descend Flight Level 5-0*". The crew acknowledged the information and clearance correctly and was advised it would be vectored for an NDB approach to RW02. When the FK70 pilot reported approaching OTBED, at 1556, he was instructed to fly a heading of 300° - the ac now approximately 27.5nm SE of Humberside Airport, passing FL61. The radar recording shows an ac displaying a London (Mil) squawk, subsequently identified as the subject Typhoon, heading S at FL50, approximately 33nm NNW of the FK70. Its squawk changes to a Coningsby assigned code at 1557, when it was at a range of about 22nm from the FK70 on a conflicting track. The Typhoon's Mode C was FL51, with a Ground Speed indicating in excess of 500kt as the FK70 indicates FL50. The APR reported that he had observed the

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military ac, both when it was showing its original squawk and also when it changed to the Coningsby assigned code.

The Humberside APR Controller decided to telephone Coningsby [at about 1557:23 from the Coningsby transcript] to try and co-ordinate a course of action. However, he was informed that the Typhoon was not working Coningsby ATC at the time. Due to the unserviceability of the Claxby SSR, the controller was using the Great Dun Fell (GDF) SSR source. He explained that, shortly after telephoning Coningsby, the Typhoon's SSR response disappeared from his radar display. This is confirmed from the GDF radar replay. At 1558:33, the Humberside Controller issued an avoiding action turn to the FK70 crew, "*[C/S] avoiding action turn left..heading of 2-7-0 degrees traffic was north of you 6 miles southbound..believed to be a Typhoon passing Flight Level 5-0 got no height..no height indication on him now*". Approximately 30sec later the pilot of the FK70 reported "*Yeah I got him in sight he's about a thousand below*". [UKAB Note (2): This statement from the FK70 crew follows the transmission of traffic information about the subject Typhoon to another military training flight under the control of Humberside that was 1nm NW of the FK70 at 3000ft BARNSELY RPS (1009mb). Thus it is not clear whether the FK70 crew were referring to the Typhoon that was at their level or had actually seen the other military training flight that was 1900ft below the FK70]. The controller replied "*if you maintain your present heading it's the best form of avoiding action against traffic north of you by 3 miles southbound should pass behind*". The FK70 pilot reported a "*descent..TCAS R-A sir*". The controller said that he did not hear this report as he was talking on the telephone to Coningsby at the time, who informed the APR that the Typhoon was at 4000ft Barnsley RPS. Shortly afterwards the pilot of the FK70 reported 'CLEAR OF THE CONFLICT' climbing back to FL50. When asked by the controller if he had received a TCAS alert, the FK70 crew confirmed they had received an RA. The pilot added "*that got within 100 feet on a Resolution Advisory with us*". The FK70 was then vectored for its approach to Humberside.

[UKAB Note (3): Although 'on maintenance' Claxby Radar data was used to produce the schematic diagram to illustrate this encounter more fully. Whereas the ATSI report included data from the GDF radar recording, resulting in a slight variation in range, time and levels when the Typhoon's squawk was displayed by the GDF once more from 1559:06. For ease of reference, data from the Claxby Radar is included here: The Typhoon is shown at FL50, southbound, 4.4nm N of the FK70 that is indicating the same level. When the range had closed to 2.2nm, the Typhoon's Mode C is indicating FL49, 100ft below the FK70, just before the latter had started its descent in response to the reported TCAS RA. At 1559:32, minimum horizontal separation of 1.5nm is shown just before the Typhoon, passes astern of the FK70, which has at this point descended to FL46, but thereafter for three sweeps no Mode C is shown by the Typhoon. The Claxby Radar shows the FK70 descended to a minimum of FL41, before climbing once more. The Typhoon's Mode C is shown again indicating FL37 at 1600:04, 4.5nm NW of the FK70, which is climbing through FL42. The Typhoon's radar calculated GS was 555kt during the period leading up to the encounter.]

MATS Part 1, Section 1, Chapter 11, states the definition of a Deconfliction Service:

"A Deconfliction Service is a surveillance based ATS where, in addition to the provisions of a basic service, the controller provides specific surveillance derived traffic information and issues headings and/or levels aimed at achieving planned deconfliction minima, or for positioning and/or sequencing. However, the avoidance of other traffic is ultimately the pilot's responsibility."

Additionally:

"A controller shall provide traffic information, accompanied with a heading and/or level aimed at achieving a planned deconfliction minima against all observed aircraft in: Class G airspace.

The deconfliction minima against uncoordinated traffic are: 5nm laterally (subject to surveillance capability and CAA approval); or 3000 ft vertically and, unless SSR Mode 3A indicates that the Mode C data has been verified, the surveillance returns, however presented, should not merge.

High controller workload or RTF loading may reduce the ability of the controller to pass deconfliction advice and the timeliness of such information. Furthermore, unknown ac may make unpredictable or high-energy manoeuvres. Consequently, it is recognised that controllers cannot guarantee to achieve these deconfliction minima; however, they shall apply all reasonable endeavours."

On this occasion, the Humberside APR attempted to resolve the potential confliction by trying to co-ordinate with Coningsby, rather than initiating avoiding action earlier. When this proved unsuccessful, due to the Typhoon not yet being in communication with Coningsby, it was too late to initiate effective avoiding action.

Since this Airprox, Humberside ATC has produced a Standards Bulletin to 'underline the importance of early avoiding action and not relying on co-ordination to the extent that any subsequent avoiding action that may be needed would be too late'. Additionally, it is planned to introduce simulator exercises 'for all radar controllers to practice avoiding action turns against fast moving conflicting traffic'.

MIL ACC reports that the Typhoon pilot was in receipt of a TRAFFIC Service from CON15 at LATCC (Mil) in level flight at 5000ft Barnsley RPS (1009mb). CON15 reported that his workload was high, exacerbated by his own inexperience and the Claxby Radar being unavailable due to maintenance. Workload was also increased by the closure of the ALLOCATOR position. This meant all landlines and pre-notes would be managed by the controller and support controller on Console 15 in addition to the management of their own traffic.

Coningsby APPROACH received a request from Humberside APP for co-ordination on the Typhoon whilst the flight was still under the control of CON15; the Typhoon was squawking A1751 allocated to Coningsby.

The radar analysis clearly shows the Typhoon tracking SSW and level at FL50 with the FK70 co-level in the Typhoon's 11 o'clock - 15nm crossing L to R. The Typhoon is approximately 45nm N of Coningsby and operating at high speed. At 1556:57, CON15 instructed the Typhoon pilot to *"..squawk 1-7-5-1"*; the instruction was acknowledged. At 1558:03, the Humberside APR first made contact with Coningsby APP, *"Hello requesting co-ordination please, [unrelated C/S] standby my traffic is North of OTBED 4-2-7-4 [the FK70] heading South 4-2-7-4 Squawk"*. Coningsby APP identified the traffic whereupon the Humberside APR responded at 1558:11, *"Against your Traffic 1-7-5-1 [the Typhoon] I can see just south of Ottringham by 6[nm]"*. At 1558:14, Coningsby APP informed the Humberside APR, *"Not working him yet, London [Military] are trying to hand him over to me"*. [UKAB Note (5): The Humberside APR then requested *"okay can you just take 1000ft below me on Mode C please or avoid by 3[nm]"*. After checking that *"you are maintaining flight level 5-0 are you?"*, the Coningsby controller stated *"okay I will try and get him on now..but I haven't got, I'm actually not speaking to him at the moment"* adding *"will take me a few minutes to get hold of him"*. Whereupon the APR terminated the call with *"okay Ta"* at 1558:28.] Thus APP had agreed to take 1000ft vertical separation below the FK70's Mode C, or, avoid it by 3nm horizontally, but stressed that he was not [as yet] working the Typhoon. The LATCC (Mil) Console 15 Assistant Controller (Asst15) commenced the handover on the Typhoon to Coningsby APP at 1558:34, during which at 1558:51, Coningsby APP controller requested, *"Roger for coordination descend to altitude 4000ft on the Barnsley"*. At this time the FK70 was in the Typhoon's 11 o'clock about 5nm. Asst15 acknowledged the instruction, however, it wasn't until 1559:22 [over 30sec later] that CON15 transmitted to the Typhoon pilot *"[C/S] instructions from Coningsby, descend 4000 feet Barnsley 1-0-0-9"*. The Typhoon pilot acknowledged at 1559:28, *"Descending 4000 feet, visual with the traffic passing nose right now"* - the FK70 being in the Typhoon's 12 o'clock at a range of 2.2nm. [Some 4secs later at 1559:32, the Typhoon pilot was instructed to *"..contact Coningsby Stud 4"*.] The avoiding action turn onto 270° issued to the FK70 crew by the Humberside APR can just be seen taking affect. The CPA occurs with the Typhoon passing behind the FK70 with a lateral separation of 1.5nm and 300ft as the FK70 crew reacted to the TCAS DESCEND RA. [Note (6): APP called Humberside at 1559:25, advising the APR that *"..I've finally got that traffic now that you were trying to co-ordinate...4 thousand feet on the Barnsley"*. This was acknowledged by the APR who responded, *"okay I'll be turning north-westerly track now"*. The Typhoon pilot called APP at 1559:53, *"...joining from the north currently 4 thousand feet on 1-0-0-9"*. No comment was made either by APP or the pilot about the FK70.]

There are several factors that raise concern within this Airprox; at no time was the Typhoon pilot passed traffic information on the FK70 and the delay in passing on the descent instruction to descend to 4000ft RPS. This delay of 31sec in the passing of the descent instruction by CON15 was because the handover was not being closely monitored as during that period the controller was conducting another handover on an F15 to Lakenheath APPROACH. CON15 was responsible for monitoring the handover of the Typhoon to Coningsby by Asst15. While it is not uncommon for controllers and their assistants to be handing over traffic simultaneously during busy periods, it is difficult to measure the level of monitoring that was occurring during this handover as it is not possible to capture the use of visual cues. The LATCC (Mil) controller was operating using a composite radar picture with the GDF and Debden Radar heads selected - the Claxby was unavailable due to maintenance. The Typhoon was at a range of approximately 100nm from the GDF head and 75nm from the Debden with no stated limitation to the ATS. The theoretical base of solid radar cover was therefore 7500ft and the TRAFFIC Service should have been

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limited accordingly. The Claxby Radar replay was used for this analysis. If the subject ac were painting in both primary and secondary on both the Debden and GDF radars then this is not a factor and should be considered as a breakdown in procedures by the controller. However, this may have been an indicator of how busy the controller was. If both ac were painting on radar then traffic information should have been passed. [UKAB Note (4): Both of the subject ac and the additional 3000ft Humberside transit traffic were painting on the Debden Radar throughout; on the GDF only the Typhoon faded from a range of 15nm and was shown again from 4-6nm.]

The decision by the LATCC (Mil) SUPERVISOR to close the ALLOCATOR position had a direct bearing on this incident. CON15 was already working an F15, and the subject Typhoon. A transmission was also made on the ICF to another flight that had attempted to call the ALLOCATOR but was not under an ATS at the time of the Airprox. This and the additional workload of filtering the landline calls increased the workload of this inexperienced controller.

HQ AIR (OPS) comments that a combination of factors appear to have brought these two ac together. The Humberside APR's plan to coordinate with Coningsby APP was thwarted by the delay between squawk change and the comms handover resulting in him calling the Coningsby instead of London (Mil) and delaying the APR's decision to provide avoiding action. The Typhoon, moving at speed, was allocated his Coningsby squawk some miles before the handover, which took some time to complete. The subsequent delayed descent effectively brought the Typhoon into conflict at the same level causing the FK70's DESCEND RA. Finally, the lack of traffic information about the conflicting FK70 to the Typhoon pilot was also a factor.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

During this close quarters situation in Class G airspace it was evident that there were many lessons for the unwary and a significant number of Contributory Factors; since many of these factors were inter-related, in the Board's view, it was inappropriate to record them all separately in the Part C.

The ATSI report showed that the Humberside APR was providing a DECONFLICTION Service to the FK70, under which he was aiming to achieve planned deconfliction minima in Class G airspace. In this case the stipulated minima against uncoordinated traffic were 5nm horizontally or 3000ft vertically against ac with verified Mode C read-outs. Thus it was the APR's responsibility to vector the FK70 clear of the Typhoon by such a margin unless co-ordination could be achieved. Broadly, if a co-ordination agreement could be struck then the regulations in the MATS Part 1, where approved by the CAA, permit civilian controllers to operate to reduced minima against co-ordinated traffic of 3nm horizontally or 1000ft vertically on verified Mode C. On this point, the investigation of this Airprox has revealed an anomaly between current civilian and military ATC practice following the introduction of revised ATSOCAS procedures on 12 Mar 2009. Civilian controllers are permitted by MATS Pt 1 Sect 1 Chap 11 pg 8 article 5.6.4, to operate to a reduced horizontal separation minima of 3nm against ac that "*have been subject to co-ordination*". However when this Airprox occurred – about 2 months after the introduction of the new ATSOCAS – this same caveat, although agreed in principle during policy discussions between the military and civilian ATC stakeholders, had not been notified to military controllers nor had the regulations been updated to incorporate this significant change. The Board was briefed that this situation has subsequently been remedied and the changes promulgated. Whilst this had a bearing on this Airprox insofar as APP was not permitted by the extant regulations to agree to requests from other ATSUs for separation minima of 3nm *horizontally*, APP tried here to effect 1000ft separation in the *vertical* plane.

It was clear that the Humberside APR had noticed the Typhoon's squawk change from the London (Mil) assigned code to that of Coningsby, which occurred at a range of 22nm from the FK70, when he contacted Coningsby APP to effect co-ordination. Controller Members noted that the Typhoon was not at that stage under the control of Coningsby APP, who made this plain to the APR; however, it was evident that APP believed that LATCC (Mil) CON15 was intending to transfer the flight soon [the transcript reflects that 6 sec after terminating the call to Humberside, APP answered the LATCC (Mil) landline for the hand-over of the Typhoon]. The phraseology used by the Humberside APR made it clear what he was seeking to achieve – "*..can you just take 1000ft below me on Mode C please or avoid by 3 [nm]*", which was in accord with the minima stipulated against co-ordinated traffic for civilian controllers. A view was expressed that Coningsby APP had made it clear to the APR that he was unable

to conclude an agreement because the Typhoon was not yet on his frequency and he could not guarantee that the pilot would accede to the request – albeit that there was a reasonable expectation that the Typhoon pilot would do so if the flight was transferred to APP in time. However, in the subsequent handover of the Typhoon from London - under the TRAFFIC Service that applied - it was clear from the APP controller's account that he was eager to conclude the hand-over expeditiously so that he might pass on this co-ordination. Furthermore, it was clear that APP believed that he had concluded an agreement as he had instructed LATCC (Mil) to descend the Typhoon to an altitude of 4000ft “..for co-ordination”. So, with the best of intentions, but perhaps unwisely, APP had agreed to the co-ordination requested of him and tried to put it into effect. It was also noted from the transcript that it was London Mil Asst15 who initiated and conducted the hand-over, so APP should have asked for CON15 if there was co-ordination to pass on. Moreover, APP did not ask if CON15 had alerted the Typhoon pilot to the presence of the FK70, which was in his 11 o'clock at 5nm at the same level; this was an essential element of the hand-over process to ensure continuity of service during the period of the transfer of communication. Thus another opportunity was lost to pass on traffic information before the ac flew into close quarters.

CON15 had not spotted the confliction between the Typhoon and the FK70. His report indicated that he would normally have checked for low-level tracks in the vicinity of his traffic by switching to the Claxby Radar, which provided better coverage in this location. However, this source was 'out of service' to both CON15 and Humberside, who receive its SSR data, and its unavailability had an impact here. The Mil ACC report showed that the Typhoon was at a range of about 100nm and 75nm from the GDF and Debden radars respectively; in this position the theoretical base of solid radar cover was perceived to be about 7500ft. Since the Typhoon at FL50 was below the base of primary coverage, the Mil ACC advisor pointed out that it would have been good practice for CON15 to have limited the TRAFFIC Service accordingly. This might then have alerted the pilot that traffic information could be either incomplete or late and would perhaps have prompted him to pay more attention to his AI radar. But it had been shown that the FK70 was 'painting' on the Debden Radar while the Typhoon faded on the GDF recording at 15nm range from the FK70 until it reappeared at a range of about 5nm away. It was significant that no comment was made by CON15 on RT that he had lost radar contact on the Typhoon. Therefore, the Debden was probably still showing the ac to him, in which case traffic information should have been given. Conversely, he might have been unaware of the confliction because he was too busy handing over the F15 to Lakenheath. This had been suggested in the Command's report, where Mil ACC said that the decision by the LATCC (Mil) SUPERVISOR to close the ALLOCATOR position had a direct bearing on this Airprox by increasing CON15's workload; the inexperience of the CON 15 could also have been a factor. Supervisors must guard against closing operating positions too early if the traffic situation warrants retaining additional capacity for a little longer, especially where the ICF is included with the potential for free-calls.

Plainly ATC had done nothing to warn the Typhoon pilot of the imminent confliction before CON15 switched the flight to Coningsby APP. An Area controller Member opined that traffic information does not have to be passed under the Traffic Service and, moreover, the pilot's compliance must be obtained before co-ordination is agreed. However, this was not the Command's view. Furthermore the UK Mil AIP at ENR 1-6-3 makes it plain that “..where compliance with a controllers instructions is optional, a controller may assume that a pilot receiving an ATS will comply with such instructions unless he states otherwise.” Here under the ATSOCAS TRAFFIC Service, “..the controller will [shall in the MATS Pt 1 for civilian controllers] pass traffic information on relevent traffic and update the traffic information....”. Notwithstanding that the Typhoon pilot was ultimately responsible for collision avoidance whether traffic information had been passed or not, the FK70 - clearly indicating the same level - did constitute a definite hazard and both ac were displayed to CON15 before the Typhoon pilot was instructed to change frequency.

Thus the APR thought that APP had agreed to the co-ordination he proposed under the DECONFLICTION Service. It seemed clear to Members that APP had indeed done so – perhaps unwisely - and had incorrectly endeavoured to pass this on expeditiously through Asst15. However, it then took some time for the message to be passed by CON15 to the Typhoon pilot and, by the time it was passed, it was too late; with the Typhoon flying legitimately at a radar calculated GS of 555kt there was insufficient time for the coordination to be effected before the ac flew into close proximity.

Whereas the Mil ACC Advisor opined that the co-ordination apparently agreed by APP was valid, the ATSI view, concurred with by several controller Members, was that no clear-cut agreement had been struck as the Typhoon was not under control of Coningsby APP at the time. Although civilian ATC practice permitted co-ordination upon ac that “..are about to be in receipt of” an ATS according to the MATS Pt 1 Sect 1 Chap 10 pg 1 para 2.2, in this situation and with the Typhoon flying at a high speed, it was unlikely that the agreement could have been

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implemented. In that case, 5nm horizontal separation was required against the Typhoon. For military controllers the UK MIL AIP at GEN 3-3-2 4.4 permits tactical coordination to be agreed against an ac that is not yet on frequency but is about to be provided with an ATS.

Whilst there can be many factors that influence the exact nature of avoiding action instructions, some controller Members were of the view that the avoiding action issued by the Humberside APR was far too late. There were alternative options that, taken earlier, could have ensured that horizontal separation was maintained before trying to improve the situation through co-ordination. Clearly the Board has the benefit of hindsight, and it was acknowledged that the loss of GDF radar contact on the Typhoon would have undoubtedly impeded the tracking of the fast jet by the APR, although the primary contact should still have been apparent on the Humberside ASR. In the event, having turned the FK70 on to W when he did, there was little else that APR could have done; given the speed of the Typhoon, running ahead of it was not an option, and the transit traffic below at 3000ft RPS was a complicating factor. Whilst an earlier turn might have provided more time for the coordination to be implemented, the Board agreed that the avoiding action had been initiated too late to be effective and was a Contributory Factor to the Airprox. Final resolution of the conflict eventually came about solely through the action of the pilots involved. With no traffic information forthcoming beforehand, the Typhoon pilot had detected the FK70 on AI radar, acquired it visually and elected to turn L and descend to remain clear. Shortly thereafter, and prior to the Typhoon crossing through their 6 o'clock, the FK70 crew reacted to their TCAS RA and descended themselves. Weighing all these factors carefully during a wide ranging debate, the Board concluded that this Airprox had resulted from a conflict in Class G airspace, resolved by the Typhoon pilot and the FK70 crew reacting to their TCAS RA.

Turning to the Risk, the FK70 crew's response to the APR's traffic information about the Typhoon suggested that they had seen the fighter. However, as the FK70 crew referred to traffic seen below them, it seemed more likely that they had actually seen the other military training flight that was 1900ft below them, rather than the Typhoon at their level. Members agreed that as the FK70 pilot had reported flying in and out of ill-defined cloud layers and IMC when the incident occurred it was unlikely they had seen the Typhoon. Fortunately, the Typhoon pilot had detected the FK70 on his AI radar, which cued his eyes on to the airliner and enabled him to turn and descend away from it. Fortuitously, the FK70 had passed through the Typhoon's 12 o'clock by the time they reacted to the TCAS RA instruction to descend. This Airprox provides a good illustration of what can occur in a TCAS RA event when the other aircraft is squawking but not fitted with TCAS, thus preventing any TCAS-TCAS coordination. Nevertheless, the Typhoon pilot would have been able to manoeuvre his agile fighter further out of the way if needs be. Finally, in the geometry of this Airprox, replicated by the radar recording, the Typhoon was always passing astern of the FK70. These factors, when considered with the minimum horizontal separation of 1½nm, persuaded the Board that there was no risk of collision.

PART C: ASSESSMENT OF CAUSE AND RISK

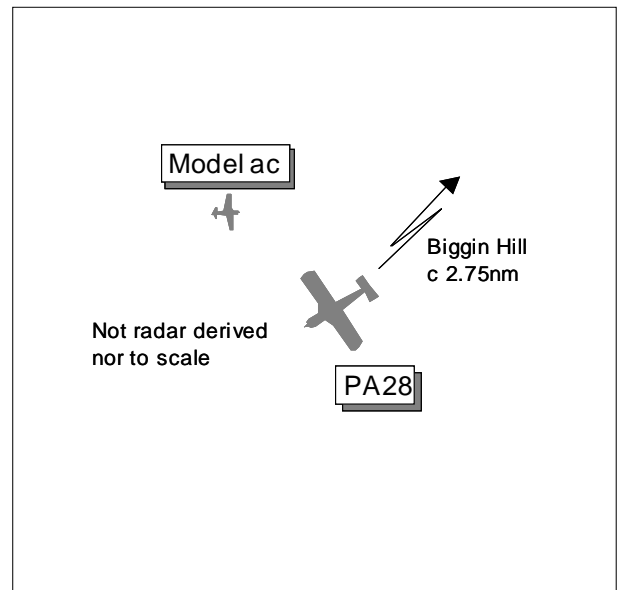
Cause: Conflict in Class G airspace resolved by the Typhoon pilot and the FK70 crew reacting to their TCAS RA.

Degree of Risk: C.

Contributory Factors: Late avoiding action initiated by the Humberside APR.

AIRPROX REPORT NO 2009-040

Date/Time: 21 May 1716
Position: 5118N 00001W (2.75nm SW Biggin Hill
 - elev 598ft.)
Airspace: FIR/ATZ (Class: G)
Reporting Ac Reported Ac
Type: PA28 Model Ac
Operator: Civ Pte Civ Pte
Alt/FL: c1800ft↑ (QNH) (N/K)
Weather VMC CLBC NK NR
Visibility: >10km NR
Reported Separation:
 100-150m H NR
Recorded Separation:
 NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE PA28 PILOT provided a very comprehensive report including his GPS track superimposed on a 1:500k topographical chart as well a large scale local map showing the same track overlaid with GPS derived altitudes. He reports outbound from Biggin Hill VFR and in receipt of a BS from Biggin on 129.4MHz squawking with Modes S and C. The visibility was >10km in VMC and the ac was coloured white/blue with anti-collision and strobe lights switched on. Prior to departure he had briefed his passengers about the 'see and avoid' principle and the use of the 'clock' code when reporting traffic. They departed RW21 at 1714 enroute to Headcorn via Caterham Motorway junction, Guildford, Goodwood, Selsey Bill and Beachy Head; the departure clearance included a R turn at 1nm. He commenced the R turn slightly later than instructed, about 1.3d and then noted crossing the ATZ boundary on the GPS display. Shortly after this his front seat passenger, seated on the R, reported seeing an ac but instead of using the agreed method he stated 'Here look at this (pilot's name) coming up on the right hand side'. The pilot, seated on the L, could not see anything and asked his colleague to be more specific. Before any response was made he saw what he thought was a red/white model rocket with smoke trailing from the rear appear just behind the R wing in a vertical or near vertical attitude and climbing rapidly. At the time he was heading 250° at 80kt climbing through about 1800ft QNH and by the time of the sighting there was no opportunity or requirement for avoiding action. The model ac had come from below his altitude, climbed through it and was still climbing. He then realised that it was not a rocket but a low-winged large model ac, which he lost sight of above him. In his RT report to Biggin he stated that the model was <200m away but subsequently he believed that separation was 100-150m. His passenger later said that initially the model ac had been flying below them on a reciprocal heading slightly to their R when first sighted. He did not note his altimeter reading at the time but his GPS recorded his altitude as 1776ft and showed the ground elevation at the incident location as 790ft. The NOTAM narrow route brief retrieved 2hr before the flight did not give any warning of model ac flying on his intended route. He assessed the risk as high. The incident occurred on the portion of the flight between the ATZ and the S edge of the Kennel Farm [Warlingham] notified Hang-Gliding and Parascending launch site, where he turned slightly L. He reported seeing 4-5 cars parked side by side in a field that could have been the model flyer's site but he could not be sure.

RAC MIL contacted Biggin Hill ATC where the Manager ATS said that they were having problems with model flying in the local area; he was aware of 3 regular model flying clubs, and these were contacted. One of these clubs was not operating on the day in question and a second was no longer operating near Biggin. A third was operational but commenced flying 30mins after the time of the reported Airprox. Two of the 3 club's operators stated that it was not unknown for "rogue" operators to set up at a random open area and commence model flying.

THE BIGGIN ADC/APP reports that at 1715 the PA28 was cleared for take-off on RW21 with a L turn at 2nm (standard VFR noise abatement departure route from RW21) [UKAB Note (1): RT recording reveals the PA28 was

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given a R turn out at 1nm]. At 1716, during the early stages of the PA28 climb-out, the pilot reported a radio-controlled ac at the same level on the RHS. When asked by the ADC/APP if he wished to file an Airprox, the pilot said that he did, adding that, had he been further to the R by 200m, to the W of the climb-out, there would have been a collision.

The Biggin Hill METAR shows EGKB 211720Z 21009KT 170V250 9999 SCT045 15/08 Q1018=

BIGGIN HILL MANAGER ATS comments that there has been an increase in the number of pilots making comment about seeing model ac flying since April/May this year, usually in the area to the SW of Biggin.

ATSI had no comments.

UKAB Note (2): The incident is not seen on recorded radar. The reported position of the incident is about 2.75nm SW of the Biggin Hill ARP.

UKAB Note (3): The UK AIP at AD 2-EGKB-1-6 promulgates the Biggin Hill ATZ as a circle 2.5nm radius centred on the longest notified RW (03/21) 511951N 0000157E from SFC-2000ft aal, aerodrome elevation 598ft.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included a report from the PA28 pilot, recordings of the relevant RT frequencies, radar video recordings, reports from the air traffic controllers involved and reports from the appropriate ATC authorities.

It appeared that someone who was not a member of an affiliated club using a notified site or abiding by BMFA rules and guidelines was flying the model ac seen by the PA28 pilot. The model ac appeared to be flying higher than normal, and possibly high enough to create problems for the ground operator to assess visually the model's attitude or control its flightpath. Also, with increased range between model and operator it was unknown whether the model would be continuously 'under control' - within range of the operator's transmitter - during its manoeuvring. Members agreed that without knowledge of the model ac's weight and size, it would be difficult for the PA28 pilot to gauge separation with any degree of accuracy (possibly a small model close-by or large model further away), particularly when only a brief sighting occurred. In light of these inconclusive elements, the Board could only agree that the untraced model had flown close enough to cause the PA28 pilot concern but that the actual risk that pertained at the time could not be determined.

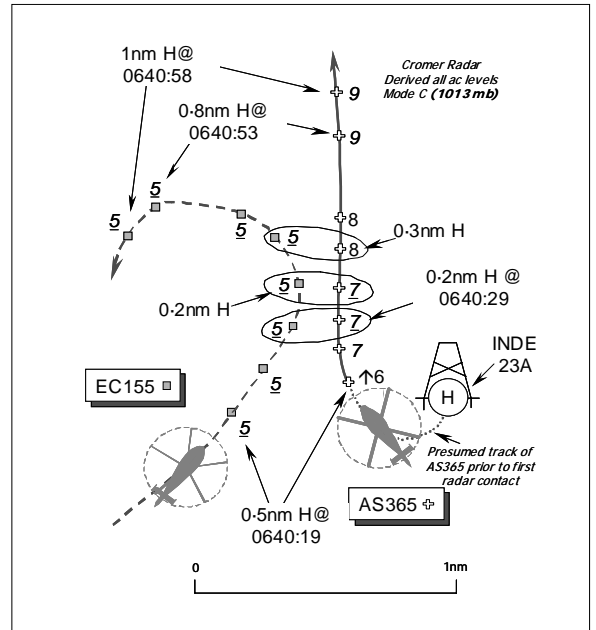
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The untraced model ac flew close enough to cause the PA28 pilot concern.

Degree of Risk: D.

AIRPROX REPORT NO 2009-041

Date/Time: 21 May 0640
Position: 5320N 00233E (060° (T) Cromer 49nm)
Airspace: HPZ (Class: G)
Reporting Ac Reported Ac
Type: EC155 B1 AS365
Operator: CAT CAT
Alt/FL: 450ft 700ft
 Rad Alt amsl
Weather VMC CLOC VMC
Visibility: 25km +10km
Reported Separation:
 50ft V/4-500m H 200ft V/0.5nm H
Recorded Separation:
 200ft V/0.2nm H



BOTH PILOTS FILED

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

UKAB Note (1): This Airprox occurred in the INDEFATIGABLE Helicopter Protected Zone, no ATS is provided in this airspace only a Flight Watch - a watching brief over the movement of ac - and an Alerting Service – to notify appropriate organisations regarding ac in need of SAR assistance and assist such as required. Here the HPZ is not accorded the same status as, for example, an ATZ. The HPZ is to all intents and purposes Class G airspace where ‘see and avoid’ prevails.

THE EC155 B1 PILOT reports that he was outbound from Norwich to the Seafox1 - a self-elevating accommodation, maintenance and workover rig - under IFR in VMC. Mode S is fitted but his ac is not equipped any form of CWS.

He had ended “*their contract*” with ANGLIA RADAR passing 1000ft in the descent and switched to the ‘Area’ frequency for the INDEFATIGABLE Helicopter Protected Zone (HPZ) (123-625MHz) for a FLIGHT WATCH/ALERTING SERVICE from the Rig - SEAFOX1 RADIO. Once level at 450ft Rad Alt, some 50nm ENE of Cromer Light [Lat & Long given] heading 052° at 145kt with 5nm to run to their destination rig, the PF called “traffic 2 o’clock” and immediately initiated avoiding action of a 45° banked turn to the L into an orbit. The other ac - a yellow Eurocopter 365N3 Dauphin helicopter – had been spotted about ½nm away climbing slowly as it crossed ahead from R – L at the same altitude. Minimum vertical separation was estimated to be 50ft and the minimum horizontal separation some 400-500m with the Risk of a collision assessed as “*high*”.

THE AS365 PILOT reports they were operating under IFR on a flight from Norwich via the THAMES field, INDE 23A platform and TYNE field, thence back to Norwich in VMC. They were departing from the INDE 23A [within the INDEFATIGABLE HPZ – surface to 2000ft ALT - and from the UK AIP charted in position 53°19’ 24”N 002°34’28”E]. After take-off heading 240° they turned R onto a northerly heading and climbed to an altitude of 700ft, when the left hand seat PNF reported he’d seen another helicopter “*very close*”, slightly lower, and to their left. The crew did not see the EC155 when they took-off from the deck of INDE 23A and, since their post takeoff manoeuvre was a climbing turn away from it, the PF had not seen the EC155 helicopter at all and no avoiding action had been initiated. It was estimated that the EC155 passed 200ft below his helicopter about ½nm away to port at the closest point.

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The AS365 crew were about to call ANGLIA RADAR on 125-275MHz but when the Airprox occurred they were still on - 123-625MHz – [UKAB Note (2): the pilot noted this as “*the offshore freq.*” – but is the Area Traffic Frequency for INDEFATIGABLE] and had given their take-off call on that frequency. Before their initial approach to INDE 23A, Anglia RADAR had told them about another helicopter [the EC155] that would be in the area later on. He assessed the Risk as “*high*” and a report was filed with his company FSO. Neither Mode S, TCAS nor other form of CWS is fitted.

THE ANGLIA RADAR CONTROLLER reports that he was operating on 125-275 MHz the two helicopters were shuttling within the INDE Gas Field in the ANGLIA RADAR area of responsibility. The AS365 departed the INDE Field and requested a northbound transit at 1500ft amsl to one of the northern fields and was advised there was nothing to affect his transit, however, it seems that whilst departing the INDE Field the AS365 flew very close to the EC155.

ATSI reports that neither helicopter was in contact with Anglia RADAR at the time of the Airprox - about 0640. Before the Airprox occurred, the AS365 was routeing from the Thames Platform to the INDE Field (Rig 23A) under an OFFSHORE DECONFLICTION Service from Anglia Radar. The EC155 was outbound from Norwich to the INDE Field (SEAFOX 1), also under an Offshore Deconfliction Service. At 0626:27 – over 10min before the Airprox occurred - the AS365 crew reported “*two way with the INDE they have the watch request descent and frequency change*”. Anglia RADAR approved both the descent and frequency change, adding that there was no known traffic in the field at this time. The controller then passed traffic information to the AS365 crew about two helicopters, one being the subject EC155 which was “*just passing the HEWETT outbound to the INDE 2000 feet at this time*”. The AS365 crew replied “*copied all the traffic and frequency change and descent approved call you later..we will be going to the Tyne*”.

At 0636:52, the EC155 pilot reported “*we’re in the descent and frequency change to the Seafox 1 they have our flight watch*”. The descent and frequency change was approved. Some 3min later the AS365 crew contacted ANGLIA RADAR and reported airborne from the INDE 23A, inbound to the Tyne, at 500ft, requesting 1500ft. The pilot was informed there was “*no known traffic to affect your 1 thousand 5 hundred feet*”. At 0641:50, the pilot of the EC155 returned to the ANGLIA RADAR frequency requesting information about a helicopter, which had taken off from INDE 23A “*in front of us*”. This was confirmed as the subject AS365. No comments were made, at the time, about filing an Airprox report.

In their subsequent reports, both pilots stated they were on the INDE Field frequency - 123-625MHz. These field frequencies are not recorded. The UKAIP at ENR 1-15-11, states that from off-shore installations “*Lifting calls should be made on the [Area] Traffic frequency*”. The same publication, at ENR 1-15-1, states the ATC services provided in the Anglia area of responsibility:

“The ATSU will provide, within its specified area of responsibility, Deconfliction Service or Traffic Service within the limits of surveillance cover. Outside surveillance cover or in the event of surveillance failure, a Basic Service and Alerting Service will be provided within the limits of VHF cover. These services will be provided to helicopter pilots routing: (a) To off-shore installations, until the time that the pilot is in contact with the destination rig/platform; (b) from off-shore installations, from the time two-way communication is established with the ATSU, until the time that the pilot is in contact with the destination landing pad or other agency”.

UKAB Note (3): The Cromer Radar recording shows the EC155 identified from its Mode S AID indicating a level cruise at 500ft Mode C (1013mb), which was maintained throughout the encounter. At 0640:19, the AS365 is displayed for the first time during the Airprox, climbing through 600ft Mode C (1013mb) as it departs from the vicinity of the INDE 23A, some 0.5nm ENE of the EC155. At 0640:29, the AS365 steadies northbound and levels at 700ft Mode C as the two helicopters close to a minimum horizontal separation of 0.2nm and 200ft vertically. The EC155 then commenced a L turn into the reported orbit maintaining a range of 0.2nm, still some 200ft below the AS365. On the next sweep the AS365 has climbed to 800ft Mode C and the range has opened to 0.3nm as the EC155 maintains the L turn. Horizontal separation of 1nm and 400ft is evident at the point the EC155 turns through SW at 0640:58, as the AS365 clears to the N.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It was evident to the Members that neither of these two helicopter flights was in receipt of an ATS after the crews had terminated the OFFSHORE DECONFLICTION Service and switched from Anglia RADAR to the Area Traffic Frequency. Thus, whilst under a 'flight watch' from the respective radio stations, and despite both reports stating that they were operating under IFR, in the Class G environment of the HPZ, 'see and avoid' prevailed in VMC as the only means of maintaining separation between ac. Commercial pilot Members were in little doubt, therefore, that this was fundamentally a lookout and sighting issue.

It was plain that the EC155 crew was unaware of the presence of the AS365 before it was spotted departing from the INDE 23A and avoiding action taken to remain clear of it. Whilst it is reported that both crews were listening to the same RT frequency – the Area Traffic Frequency – when the Airprox occurred, this frequency is not recorded. Therefore, while the Board had no reason to doubt the AS365 pilot's statement that a 'lifting' RT call was made on the Area Traffic Frequency, it could not be independently substantiated. Clearly, the EC155 crew did not hear a 'lifting' call and Members were keenly aware of the myriad of reasons why RT transmissions might have been missed – in either cockpit. Without any RT recording it was impossible to determine positively whether the transmission went out or why it was not heard by the EC155 crew as they transited to the W of the INDE 23A toward their destination. This Airprox was a good illustration of the reliance that is placed on RT broadcast calls in highlighting the presence of traffic to other pilots and, in the absence of ATC, the role of RT in enhancing crews' overall situational awareness in this busy environment.

One CAT pilot Member opined that the EC155 crew seem to have been surprised by the sudden appearance of the AS365 and thought that, as crews are aware of the intense nature of offshore helicopter operations, they would naturally be looking out for other helicopter traffic taking off from rigs with heli-decks along their route. Whilst this view was supported by a controller Member, it would seem that the near 'head-on' aspect of the small AS365 as it climbed away from the INDE 23A's heli-deck, heading 240°, with little crossing motion at that stage to draw attention to the helicopter, had plainly defeated the EC155 crew's visual scan. Similarly, the AS365 crew was completely unaware of the approaching EC155 as they took-off. In the Board's view, a collision warning system could have assisted both crews' visual lookout here and Members were cognisant of the intrinsic value of TCAS and previous Safety Recommendations made by the UKAB on this topic. As it was, with no form of TCAS to highlight the presence of the AS365, it was not until it was turning R onto its outbound heading that the EC155 crew spotted it in their 2 o'clock, recognised there was a conflict and turned L to avoid it. Therefore, the Board agreed unanimously that this Airprox had resulted from a conflict in a Helicopter Protected Zone resolved by the EC155 crew.

Turning to the Risk, the radar recording illustrated the geometry of the encounter and Members agreed that the EC155 was in the AS365 crew's field of view. Nevertheless the AS365 crew had not been aware of the other helicopter and did not see it until after they turned outbound and had climbed through its level, when the left hand seat PNF reported he'd seen another helicopter "very close", slightly lower, and to their left. Plainly the AS365 crew had been unaware of the conflict beforehand and had, therefore, not been able to affect the outcome. For their part, the EC155 crew had spotted the other helicopter at a range of ½nm and taken prompt and effective action to stay out of its way. Whilst not ideal, in the Board's view this had been sufficient to enable the EC155 crew to take positive action to remain clear. The radar recording confirmed the EC155 pilot's estimate that horizontal separation was not less than 0.2nm – 400yd. Moreover, the Mode C data had reflected that the AS365 was in excess of ½nm away when it climbed through the EC155's altitude and 200ft above the latter at the closest point. Members agreed unanimously that no risk of a collision had existed in the circumstances conscientiously reported by both pilots.

PART C: ASSESSMENT OF CAUSE AND RISK

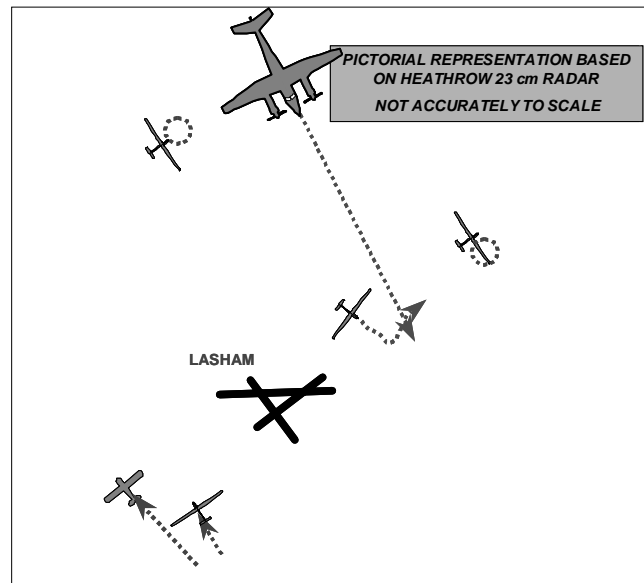
Cause: Conflict in a Helicopter Protected Zone resolved by the EC155 crew.

Degree of Risk: C.

AIRPROX REPORT No 2009-042

AIRPROX REPORT NO 2009-042

Date/Time: 24 May 1650 (Sunday)
Position: 5111N 00100W (1nm NE Lasham - elev 618ft)
Airspace: London FIR (Class: G)
Reporting Ac Reported Ac
Type: KA6 Glider BE200
Operator: Civ Pte Civ Comm
Alt/FL: 3500ft 3400ft
(QNH) (QNH 1019mb)
Weather VMC NR VMC NR
Visibility: 30km untd
Reported Separation:
50ft V/50m H 500ft V/1600 H
Recorded Separation:
NR See UKAB Note (2)



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE GLIDER PILOT reports that she was flying a white and red glider with no radio or transponder fitted and, at the time of the incident, had been soaring locally for about 2hr. She was thermalling in a right turn at 40kt, just to the ENE of Lasham airfield and each turn was taking about 20-25sec to complete. During the course of her lookout she had noticed a glint in the distance to the N, which appeared to be far enough away not to cause any concern and could have been another thermalling glider.

On completing the next turn some 20sec or so later, the other ac had become a significant threat as it was by then approximately 500m away at her level and approaching very fast on a collision course. As she was already turning to the right, her only course of avoiding action was to increase the bank to the right and dive away; as the ac passed by behind and slightly above her she clearly heard its engines. She then reduced the angle of bank and converted the additional speed back into height and as she did this she flew through the wake of the other ac and saw it continue on its way without having changed course. She identified the other ac as being a low-winged twin, either white or silver in colour and estimated that it was flying at about 200kt and on a southerly track. She believed that the other pilot had not seen her ac as no avoiding action was seen. She assessed the risk as being very high, reported the incident to the CFI on landing, and he called Farnborough to try to identify the other ac.

She helpfully provided a 1:25000 map showing the ac positions and tracks. This showed the other ac tracking about 1.5km to the E of the Lasham ARP.

THE BE200 PILOT provided a comprehensive report stating that he was on a flight from Inverness to Shoreham in a silver ac with all lights switched on, squawking as directed by Farnborough APR, with Modes C and S. Farnborough asked them if they wished to route CPT- GWC-Shoreham, thus leaving CAS airspace in the descent, rather than following the IFR flight planned route of CPT-PEPIS-SAM-GWC-Shoreham. They accepted the rerouting and exited CAS airspace in the descent N of CPT descending initially to 5000ft in receipt of a TS and at CPT descended further to 3400ft (QNH 1019) routing CPT-GWC-Shoreham.

The weather was CAVOK with good visibility; it was a bright sunny afternoon.

On-route from CPT to GWC, APR informed them that they would be passing near Lasham (they passed to the E of Lasham, passing latterly between Lasham and Odiham ATZs sic) and that there were multiple contacts in the vicinity. As they approached the Lasham area they were again informed that there were multiple contacts, possibly gliders, in the area, height unknown.

They were heading a about 155° at 180kt and were keeping a good lookout as they approached the Lasham area from the N when they were informed of a glider contact in their 12 o'clock, height unknown. Both he and the pilot assistant (CPL/IR) saw a glider left of their 12 o'clock position, he estimated about 1nm ahead, 500ft above and between 300-500ft to their left. The glider was heading roughly N and was commencing a turn to the right (E), which he took to mean the pilot had seen them. The turn they were in the process of executing resulted in their paths diverging further.

Of the 4 other reported gliders in the area, the BE200 pilot was visual with one of them, at least 1000ft below him and at least 1nm to the right (W). This 2nd glider was also on a Northerly heading and was not in conflict. He judged that there was no conflict or danger of collision with either of the gliders he could see and did not make any altitude or heading changes as he did not believe any to be necessary. He maintained visual contact with both gliders until they passed clear of them and continued to look out for the 3 other reported contacts.

On landing at Shoreham he was asked to contact ATC, who informed him that the Farnborough controller wished to advise him that a glider pilot was intending to file an Airprox (he assumed it was the glider ahead and to the left of them).

Upon his return to Fairoaks later that day, he informed the duty management staff. He provided copies of the weather from their flight and the PLOG from that leg of the flight. In addition to the onboard equipment his ac had a portable GPS, which logged flight data. He has checked the recorded track from the flight, which was a direct track from CPT to GWC passing between Odiham and Lasham.

He assessed the risk as being low.

ATSI reports that at 1644:19, the BE200 made its first call to Farnborough Approach (APR) while in the descent to leave CAS; the pilot reported descending to 5000ft on "1019 at Compton". APR responded by issuing the ac a descent to 3400ft on the Farnborough QNH 1019, for traffic purposes and adding "...it'll be a Traffic Service outside controlled airspace, reduced traffic information due to your track taking you through an area of high traffic density, possible late warning of traffic". The pilot correctly read back both level and the pressure setting adding, "...limited traffic service ...now routeing Goodwood". The BE200 was at this time 342°/20nm from Lasham and according to the APR's report, on its own navigation CPT - GWC - Shoreham.

A TS is defined in MATS Part 1, Section 1, Chapter 11 as:

"...a surveillance based ATS, where in addition to the provisions of a Basic Service, the controller provides specific surveillance derived traffic information to assist the pilot in avoiding other traffic. Controllers may provide headings and/or levels for the purposes of positioning and/or sequencing; however, the controller is not required to achieve deconfliction minima, and the avoidance of other traffic is ultimately the pilot's responsibility". In addition *"The controller shall pass traffic information on relevant traffic, and shall update the traffic information if it continues to constitute a definite hazard, or if requested by the pilot. However, high controller workload and RTF loading may reduce the ability of the controller to pass traffic information, and the timeliness of such information"*. Chapter 11 also expands upon the various reasons why a controller may consider a reduction in traffic information. For the one quoted on this occasion it explains *"High traffic density can cause difficulty interpreting ATS surveillance system data and may affect RTF loading or controller workload to the extent that the controller is unable to pass timely traffic information ...on all traffic"*.

At 1645:46, APR issued the BE200 with TI *"(callsign) traffic in your twelve o'clock and half past twelve range of seven miles and eight miles intermittent contacts believed to be gliders, level unknown"*, the pilot replying *"...looking"*. Over the next 2min, APR attended to other traffic until 1648:00 when the controller returned to the BE200 and passed further TI, *"(callsign) traffic twelve o'clock range of four miles believed to be a glider at Lasham level unknown, there's further contacts also between your eleven o'clock and your two o'clock er at least five contacts observed levels unknown believed to be gliding at Lasham, caution as you transit through their overhead"*, to which the pilot replied *"copied and looking..."*

At this time, the radar recording shows, the BE200 is about 5nm NNW of Lasham and on a track that would take it about 1nm to the E of the aerodrome. Not all the primary-only targets reported by APR are seen on the radar recording available to ATSI (Heathrow 23cm) as the controller was using the Farnborough airfield primary-radar source, which is not recorded.

AIRPROX REPORT No 2009-042

At 1649:00, the BE200 pilot was given further descent to 2400ft, which he also correctly readback. The only guidance to radar controllers on the avoidance of Lasham appears in the Farnborough MATS Part 2, where it states, at APR-26, "*Lasham does not have an ATZ but radar controllers are advised to avoid vectoring ac within 3nm of Lasham.*" 'Vectoring' is defined in the MATS Part 1, Glossary, as "*Provision of navigational guidance to ac in the form of specific headings, based on the use of an ATS surveillance system. (ICAO)*". On this occasion, the BE200 was under its own navigation.

At this point, the radar recording shows intermittent slow moving primary only targets in the BE200's 12 o'clock to 1 o'clock at a range of about 1nm. In addition a single target is visible, manoeuvring in the BE200's 10:30 position at a little over a mile. Although issued with further descent, the ac remained at 3400ft Mode C and over the next 30sec, flew through this area of activity, but the pilot made no reference to either seeing any gliders or that an incident had taken place. Unfortunately, the CPA of the subject ac does not appear on the available radar recording. By 1654, the ac had descended to 2400ft at which point the pilot requested a change of frequency to Shoreham, which was approved and the Traffic Service terminated.

There are no apparent implications for ATC in this incident. The Farnborough APR provided both specific and generic traffic information to the BE200 in accordance with the terms of the Traffic Service being provided to the flight.

UKAB Note (1): Lasham is promulgated as a Glider Launching Site HJ, (by winch/ground tow and tug aircraft/motor glider) 0-3000ft agl [3618ft amsl] site in the UK AIP ENR 5-5-1-3.

UKAB Note (2): The recording of the Heathrow 23cm radar shows the BE200 tracking 150°, level at 3400ft, 3nm to the N of Lasham at 1648:43. It is tracking directly towards a group of 3 intermittent primary only manoeuvring contacts presumed to be gliders. At 1649:20 the BE200 passes through the orbit of a glider, between sweeps, very close to it (estimated to be less than the minimum accuracy of the recording (0.1nm – 185m)). Since the glider has no Mode C the minimum vertical separation cannot be determined. The diagram above is approximate as the glider was most likely turning between sweeps.

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.

Controller Members familiar with operations in the incident area informed the Board that, despite the flight planned routeings, pilots inbound to South Coast airfields from the CAS to the North of London are frequently offered such a rerouteing, requiring a descent out of CAS at CPT, even though they are still operating under IFR. It was explained that this procedure avoids the congested Heathrow and Gatwick arrival and departure routes and minimises the time flown through the London TMA. It was also explained that almost certainly, the re-routeing would have been offered by LTCC (TMA South), not Farnborough as stated in the BE200 pilot's report; this alternative was given further credence since the Farnborough RT transcript and radar recording showed the BE200 to be already in the descent out of CAS to the S of CPT when it was handed over to Farnborough. Since this was not initially apparent, a transcript of the London RT was not requested by the UKAB; therefore the detail of the reroute proffered to the BE200 pilot could not be determined. Both controller and pilot Members agreed, however, that this was not a prudent routeing to be either offered or accepted since Lasham is well known as being active with very many gliders, particularly on weekend days in the Summer, in CAVOK and good gliding conditions [from the weather report attached by the BE200 pilot]. The BGA nominated Member advised that on such days remaining in CAS until required to leave it on descent, although not totally eliminating the risk, significantly reduces the possibility of encountering a glider.

As confirmed by the BE200 pilots, the ATSI report and the radar recording, the Lasham/Odiham/Farnborough area was unsurprisingly very busy with gliders. Controller Members noted that the Farnborough Controller had placed the BE200 on a TS, presumably because a DS was not practicable due to the high traffic level and the airspace constraints; further this high traffic density had caused the controller to limit the TS. Pilot Members accepted that the controller had no alternative but opined that the ATC service had been reduced to the minimum normally compatible with IFR operations. Controller Members observed that within these constraints the Farnborough Controller had passed accurate and timely TI to the BE200 pilot regarding the contacts seen by the controller to be in conflict. The ATC proffered re-routeing had directly resulted in the BE200 pilot effectively flying VFR (see

and avoid) in an area of high traffic density at his altitude and, once committed, it was too late to adopt an alternative course of action. Indeed, one Member pointed out that although the BE200 did not fly over Lasham Airfield, it passed within 1km at an alt below the max cable launch alt of 3618ft and that Odiham too is promulgated as a glider Launch Site [up to 2905ft amsl]. Further, although not a prohibition (see ATSI report) the **London** Radar Map Overlay has a 3nm radius round Lasham to remind controllers of its significance.

Having examined the ATC and procedural aspects of this incident and accepting that the BE200 pilot had been offered and accepted an imprudent routeing, Members noted that both the BE200 and the glider had been operating legitimately in Class G airspace where they had an equal and shared responsibility to see and avoid other ac; they agreed, therefore, that the cause of the incident had been a sighting issue. While orbiting, the glider pilot had seen the BE200 (probably) at some distance but had not recognised it as a threat until a fairly late stage, 20sec or so later after the next orbit. She then took effective action to avoid the BE200, thus removing any risk of collision. The BE200 pilot on the other hand saw several gliders but considered none to be a threat. Members considered that the Glider pilot's reported miss-distance was most likely to be reasonably accurate and it was verified (partially) by the radar data. That being the case, Members agreed that the BE200 crew had probably not seen the glider actually involved but rather the two others some distance away; bearing that in mind, and also that they considered the (unverified) miss-distance to be significantly less than optimal, Controller and pilot Members agreed that the normal safety margins had been reduced.

The Board was concerned that there had been several cases recently (2 others also reviewed at the same meeting) where apparently experienced professional pilots had flown very close to gliders without seeing them. A Controller Member observed that, although in this case the BE200 was not TCAS equipped, had the glider had a transponder, the Farnborough Controller would have been aware that it was at the same alt as the BE200 and would most likely have passed more informative TI to the crew.

PART C: ASSESSMENT OF CAUSE AND RISK

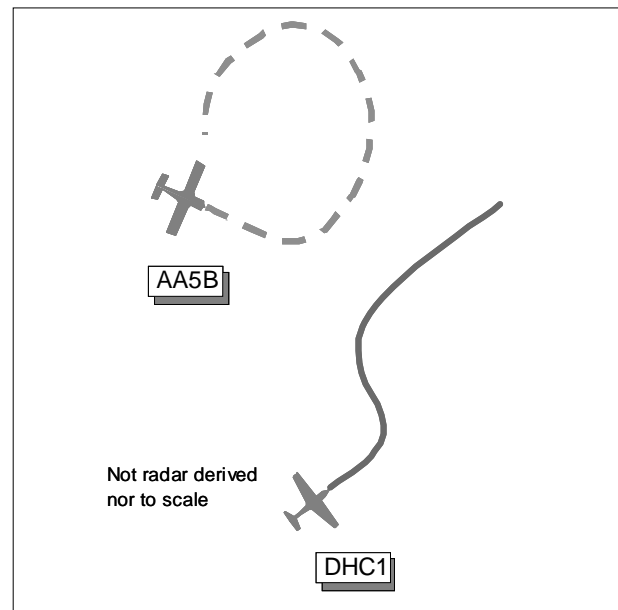
Cause: Probable non-sighting by the BE200 crew.

Degree of Risk: B.

AIRPROX REPORT No 2009-043

AIRPROX REPORT NO 2009-043

Date/Time: 31 May 1248 (Sunday)
Position: 5731N 00321W (4nm SSW Easterton
G/S - elev 361ft)
Airspace: FIR (Class: G)
Reporting Ac Reported Ac
Type: AA5B Tiger DHC1
Chipmunk
Operator: Civ Club Civ Club
Alt/FL: 3500ft 3000ft↓
(QNH 1030mb) (QFE)
Weather VMC CAVOK VMC CLBC
Visibility: NR 'Unlimited'
Reported Separation:
<30ft V/<0.5nm H 100ft V/200m H
Recorded Separation:
NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE AA5B PILOT reports enroute from Dornoch to Aberdeen VFR and in receipt of a BS from Inverness Radar on 122.6MHz squawking 6176 with Mode C. The Wx was CAVOK and the ac was coloured white/blue with strobe lights switched on. Whilst in the cruise at 3500ft, he thought, QNH 1030mb heading 115° at 110kt he received TI on traffic to the W, he thought, at about 1nm range but there was no height information. He looked for the traffic but did not visually acquire it, later believing that it may have been obscured by the starboard canopy arch. After speaking to his passenger he resumed his scan and saw a single engine ac in his 2 o'clock range 0.5nm travelling R to L across his ac's nose at what he thought was the same height, within 30ft vertically. He monitored the situation for a few seconds to determine if the other ac's pilot had seen his ac and what avoiding action he might take. Given the relative positions of the ac, continuation on his present heading would have resulted in a collision so he broke hard L into a 360° orbit. He lost sight of the ac as he turned away to the N but saw it again off to his port side about 0.5nm away as he turned through S to pass behind. The other ac then made a slow turn to the N and commenced a gentle descent. He contacted Inverness Radar and obtained confirmation that the other ac was visible on radar but that it was not on frequency. He thought it might have been a tug ac from the nearby gliding site at Easterton as it appeared to be descending towards the site although he had no evidence for this. He assessed the risk as high.

THE DHC1 CHIPMUNK PILOT reports flying aerotow sorties from Easterton VFR and in communication with Easterton on 130.1MHZ; no transponder was fitted. The Wx was good with unlimited visibility below cloud and the ac was coloured white/red; no lighting was mentioned. There were quite a few gliders airborne and he had just towed a glider up to a height of 3500ft on the QFE to a position near a wind farm about 4nm downwind to the SW of Easterton. After glider release he was descending at 100kt heading back towards the airfield on a roughly NE'ly heading and as he made a positioning turn to the L at about 3000ft he saw a PA28 type on an E'ly track come into view at about the same height, within 100ft vertically, on a converging course. It was difficult to judge the separation at this point but estimated it to be about 200-300m. On seeing the other ac he immediately altered course to the R and simultaneously the other ac altered course to the L; he watched it continue to turn away until he lost sight of it well behind him. He then continued his descent into Easterton and then saw it again, well off to the S, having made a 360° turn away. He assessed the risk as low. He opined that initially the other ac would have been approaching his position from behind and, in effect, be overtaking him. It was only when he made his course alteration to the L that the other ac came into view. He surmised that the other ac's pilot would probably have been receiving a BS from Inverness and would have been advised of other known traffic in the area. Furthermore, he believed that had the other ac continued on its original course, it would have passed very close to, if not O/H Easterton where extra vigilance would be required owing to the gliding and tugging operations.

THE INVERNESS APP/APR reports mentoring a trainee who was maintaining the fpps as well as observing the traffic situation. The AA5B flight called on frequency on a transit flight from Dornoch to Aberdeen cruising at 3000ft QNH. As the ac turned on track to Aberdeen S of Kinloss MATZ the APP/APR issued a generic warning to its pilot alerting him to the possible presence of gliders before passing the RPS (Orkney 1026mb). The rationale behind this warning was a verbal report of glider activity that had been received from another pilot transiting this area within the previous 5min; radar data did not provide any information at this stage to confirm this report. Shortly after changing the AA5B's squawk from 6177 (Inverness conspicuity) to 4260 in preparation for transfer to Aberdeen, a pop-up primary only return appeared 1nm SE of the AA5B. He passed TI as he believed a definite risk of collision existed. The AA5B pilot initially reported no contact, closely followed by reporting contact at the same level and a sharp avoidance turn to the L. A brief exchange ensued in an attempt to ascertain the identity of the unknown ac and the AA5B pilot was asked if he wished to file an Airprox which he declined. Later after landing, the AA5B pilot telephoned to state he wished to file an Airprox.

The Inverness METAR was EGPE 311220Z 05008KT CAVOK 21/11 Q1030=

ATSI reports that the incident took place about 20nm ESE of Inverness in Class G airspace and occurred outside of recorded radar coverage. At 1227:30, the pilot of the AA5B established communications with Inverness Approach reporting flying an AA5B Grumman Tiger en-route from Dornoch direct to Aberdeen at 2000ft and requesting a BS. The controller, operating combined APP/APR, confirmed a BS would be provided and issued the Inverness QNH 1030mb, which was all readback by the pilot. The controller then ensured that the ac was wearing the Inverness SSR conspicuity code 6177, to provide some initial visibility of the flight. About 5min later, the pilot reported levelling at 3000ft for the cruise and was then issued an Inverness discrete code. A Met Special report was issued at 1228, recording a QNH change to 1029mb, however, the RT recording does not show that this was passed to the AA5B flight.

Details of a BS appear in MATS Part 1, Section 1 and is defined as *"...an ATS provided for the purposes of giving advice and information useful for the safe and efficient conduct of flights. This may include weather information, changes of serviceability of facilities, conditions at aerodromes, general airspace activity information, and any other information likely to affect safety. The avoidance of other traffic is solely the pilot's responsibility."*

Also, *"A controller may identify an aircraft to facilitate co-ordination or to assist in the provision of generic navigational assistance, but is not required to inform the pilot that identification has taken place."*

"Pilot's should not expect any form of traffic information from a controller, as there is no such obligation placed on the controller under a Basic Service outside an Aerodrome Traffic Zone (ATZ), and the pilot remains responsible for collision avoidance at all times. However, on initial contact the controller may provide traffic information in general terms to assist with the pilot's situational awareness. This will not normally be updated by the controller unless the situation has changed markedly, or the pilot requests an update. A controller with access to surveillance derived information shall avoid the routine provision of traffic information on specific aircraft, and a pilot who considers that he requires such a regular flow of traffic information shall request a Traffic Service. However, if a controller considers that a definite risk of collision exists, a warning may be issued to the pilot."

Following a report from another flight of a soaring glider observed to the SE of Kinloss, the controller issued a warning, at 1246:55, to the AA5B pilot *"...keep a good look out in your present vicinity there might be a lot of gliding activity that I can't see on radar"*. This was acknowledged and the flight was then provided with the Orkney RPS 1026mb and, in preparation for its transfer, was issued an Aberdeen squawk. Moments later, at 1247:35, the controller issued TI to the AA5B flight *"...traffic er one mile southeast of you appears to be crossing right to left very slow no height"* the pilot responding *"We're maintaining lookout I'm not visual at the moment (c/s)"*. Thirty seconds later, the AA5B pilot reported *"...visual with that traffic er he's at our height"*. In the controller's written report, he stated he had issued the TI as he *"...believed a definite risk of collision existed"*. After a short period of silence, the pilot enquired if the traffic was on the Inverness frequency, the controller replying that it was not known to him. The pilot added *"We came within about half a mile at the same altitude I just made a quick three sixty...(unintelligible word)...to avoid that"*. About a minute later the pilot informed the controller that *"...I suspect that was the tug from Easterton gliding site"*. (Note: Easterton airfield is situated 24nm to the E of Inverness airport). Although declining to do so at the time, the AA5B pilot elected to file an Airprox by telephone to Inverness later the same day. At 1250:10, the AA5B was transferred to Aberdeen without further comment.

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There are no apparent implications for ATC in this incident. The Inverness APP/APR, though providing a BS, judged it prudent to issue specific TI in this instance, because he felt that a risk of collision existed. In the event it was a good call.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It was clear that this incident occurred in Class G airspace where pilots are responsible for maintaining their own separation from other ac through 'see and avoid'. The AA5B pilot had climbed and reported level at 3000ft routeing towards Aberdeen and had been given generic TI on possible gliding activity ahead of his track. Although well above the promulgated winch launch height for Easterton (2400ft amsl), a GA Member opined that pilots should always maintain extra vigilance when close to gliding sites by looking out for gliders setting course on, or returning from, cross country flights and for aerotow operations, which can take place several miles from the site at higher levels. Without the benefit of recorded radar data it was unclear how close the AA5B was to Easterton; however, following specific TI from the Inverness APR on an unknown conflicting ac at range 1nm, the AA5B pilot saw the Chipmunk 30sec later. Members believed that this had been a late sighting as the opportunity to see the Chipmunk had probably been there for some time. Members commended APR for giving specific TI once he believed that a hazard existed, even though the AA5B flight was only under a BS. However, pilots should not expect this 'upgrade' to the agreed service to happen routinely. A GA pilot Member opined that, although the view from the Chipmunk during its descent would have been good and its pilot was responsible for clearing the area into which he was intending to fly, he saw the AA5B late as he turned L. The late sightings by both pilots had caused the Airprox.

Turning to risk, both pilots report seeing each other although their estimates of the separation between ac disagree. That said, both pilots took positive avoiding action to deconflict their flightpaths, the AA5B orbiting L and the Chipmunk turning R, which allowed the Board to conclude that any risk of collision had been quickly and effectively removed.

PART C: ASSESSMENT OF CAUSE AND RISK

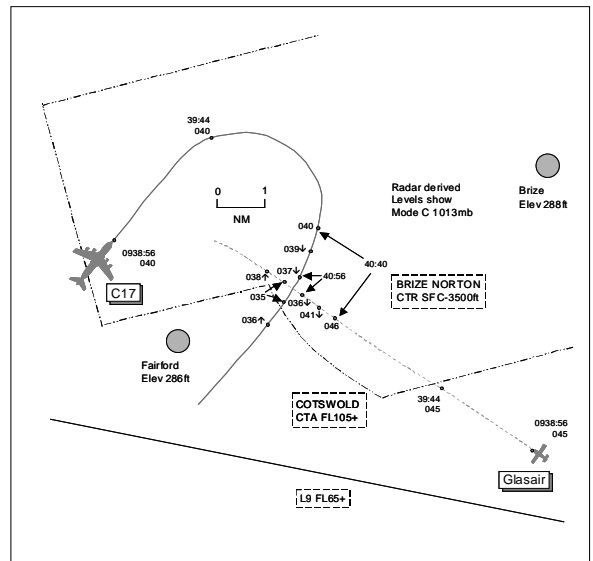
Cause: Late sightings by both pilots.

Degree of Risk: C.

AIRPROX REPORT NO 2009-044

Date/Time: 1 Jun 0941
Position: 5142N 00143W (6nm SW Brize)
Airspace: Oxford AIAA (Class: G)
Reporting Ac Reported Ac
Type: Glasair RG C17
Operator: Civ Pte HQ Air (Ops)
Alt/FL: FL45 FL40

Weather VMC SKC VMC CAVOK
Visibility: 20km 40km
Reported Separation:
 <200ft V 200ft V
Recorded Separation:
 <100ft V/ Nil H



BOTH PILOTS FILED

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE GLASAIR PILOT reports flying solo en-route from Fairoaks to Gloucestershire VFR and listening out with Brize Norton on 124.275MHz squawking with Modes S and C. The visibility was 20km in SKC VMC and the ac was coloured ivory/red with anti-collision light switched on. His ac is a very small 2-seat type with high performance and a normal cruise speed of 170kt. On the first part of his sortie he received a LARS from Farnborough flying as high as the LTMA permitted. He passed CPT at 4400ft QNH 1025mb and advised Farnborough that he was climbing to quadrantal FL45 on a direct track to Gloucestershire. This track passes over part of the Brize Norton Class D CTR but his level was well above its upper limit of 3500ft. Passing CPT he requested to change to Brize frequency and this was approved. On his initial call to Brize he was asked to standby, the frequency was busy and he covered a substantial distance without being contacted by Brize. As his track would pass so close to Brize he was keen to identify himself and when there was a significant lull in radio traffic he called again. This time, without allowing him any opportunity to pass his flight details, he was instructed to call London Information and remain outside CAS. He believed that London Info would not have been any help so he maintained a listening watch on the Brize frequency, which at least gave him the opportunity of hearing other traffic which may come into conflict. He had left his transponder on the Farnborough squawk, he thought, in anticipation of changing the code on instruction from Brize but on their refusal of a LARS he recognises he should have selected 7000 but he omitted to do so. [UKAB Note (1): Radar recording shows that 7000 with Mode C was selected prior to contacting Brize Norton]. He saw no other traffic until about 5nm SW of Brize heading 307° at 170kt and level at FL45, after setting up the standby frequency for Gloucestershire, he looked up and saw a plain grey twin-jet, he thought, transport type ac in his 0130 position. The ac's engines were large fanjet type mounted below wing and the wing tips had upward raking winglets; he didn't recognise the ac type. The other ac was flying straight and level crossing from R to L at exactly his level. The separation was probably about 1-2nm but was difficult to judge, as he did not know the actual size of the other ac. It soon became apparent that their courses would result in a collision. He was fully aware under the Rules of the Air that it was his duty to keep clear and he had adequate time for this. His preferred option was to descend below the other ac to keep it fully visual rather than turn, when his wing would have excluded the ac from his view. He expected to give it a comfortable 200-300ft vertical clearance and had it happened this way it would not have been a reportable Airprox. Unfortunately having committed to go beneath, the other ac also started to descend and he was then faced with a very fraught situation of steepening his dive to avoid a collision, all in a few seconds at a high closing speed, estimated 300kt. He descended 750ft to achieve separation, with the other ac passing <200ft directly O/H; immediately after this he climbed back to FL45 as the other ac was in his 0730 position, well below and apparently still descending. His impression was that the other ac's crew were never aware of his ac. After contacting Brize on RT and reporting

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the Airprox, he later telephoned ATC to give his flight details. He assessed the risk as high. In all his 1500hr of flying he had almost always been in receipt of a service during his enroute phase of flight and he couldn't remember when this had not been so. Also, he expressed concern that the other ac was flying close to Brize without being in contact with the Brize ATSU.

THE C17 PILOT reports inbound to Lyneham IFR and in receipt of a TS from Brize on 127.25Mhz squawking with Modes S and C. The visibility was 40km in CAVOK VMC and the ac was coloured grey with HISLs switched on. The ac was positioned in a hold over Fairford at FL40 heading 220° at 230kt when ATC advised them of traffic 500ft above in their 10-11 o'clock; this advice was coincident with a TCAS TA, shortly followed by a RA 'descend'. The ac was descended and shortly after this TCAS commanded an increase in their ROD. Again, almost immediately after this TCAS called for a 'climb' and, during this subsequent climb a small light ac was spotted passing directly beneath them by about 200ft with no horizontal miss distance. Until this sighting, despite 5 pairs of eyes looking out from the flightdeck, the other ac was not seen. He assessed the risk as medium.

THE BRIZE LARS CONTROLLER reports that after approximately 10min on position, traffic levels were increasing from low to medium-high; it was his first session after a weekend off. The Glasair pilot called on frequency when 3-4 other flights requesting a service were on standby and had been told to remain outside CAS. At the time he had 3 flights under a TS with 2 awaiting partial airways clearances and 2 flights under a BS. The Glasair pilot was told *'This unit is working to capacity freecall London Information West on frequency xxx.xxx'*. He did notice that it appeared to be an ac at FL45 to the S of Brize and therefore would probably not infringe the Brize Class D airspace. If the 2-3 flights on standby had been provided with a service he would have been working 8 ac, the limit on LARS. Furthermore, he also had 3 ac pre-noted for a TS and Oxford awaiting a callback for another pre-note. Approximately 5min later the Glasair pilot recalled on frequency stating that he wished to pass details of an Airprox, which was accomplished after LARS had released a flight to airways. The Glasair was en-route from Fair Oaks to Gloucestershire and indicated approximately 5nm W of Brize, the pilot stating he was at FL45 but had descended to FL43, he thought, to avoid a twinjet ac.

THE BRIZE APP reports he had taken over the console at 0937 following a break and was screening a trainee who was providing a TS to the C17, the only flight on frequency. The C17 had been holding in the Fairford area at FL40 above the Brize CTR for some time prior to a timed approach into Lyneham. The trainee passed TI on a contact which was approximately 3nm SE of the C17 tracking NW'ly squawking 7000 and indicating FL45. The conflicting ac's Mode C then indicated that it had started a descent. On receipt of the TI the C17 crew reported they were responding to a TCAS RA and both ac were seen to descend until the labels merged with the C17 indicating FL38 before then climbing again in response to a further TCAS instruction. The other traffic was seen to continue on a NW'ly track in the direction of Gloucestershire and the C17 re-established in his holding pattern at FL40 without further incident.

MIL ACC reports that the C17 was in a RH holding pattern overhead Brize Norton at FL40 awaiting a timed arrival at RAF Lyneham and was receiving a Traffic Service (TS) from the Brize Norton APP. The Glasair was transiting from Fair Oaks to Gloucester and had been refused a Basic Service from Brize Norton LARS. The reported weather at the time was 40kms visibility and few cloud at 30,000ft.

LARS had just replaced a colleague who was on a break when the traffic levels increased dramatically. At 0933.55 the Glasair flight first made contact with LARS, *'Brize Radar, C/S'*. The call was acknowledged by LARS at 0934:03, *'c/s Brize Radar you are number 3 on standby just remain outside controlled airspace, standby'*. The Glasair pilot called again at 0935:31, *'Brize Radar, c/s for Basic Service'*. LARS replied at 0935:34, *'c/s roger this unit working to capacity remain outside Brize and controlled airspace, free-call London Information, one two four decimal seven five zero'*. The Glasair pilot responded at 0935:46, *'c/s understand not offering a LARS service at the moment Q S Y'*. At this point the radar replay shows the Glasair approximately 14nm SSE of Brize Norton squawking 7000 at altitude 4800ft London QNH 1026mb (FL44) before showing FL45, the correct Quadrantal, just over 2min later when 8nm due S. The Supervisor was managing some of the flight strips for LARS whilst also maintaining supervision of the radar room. The U/T APP was working the C17 providing a TS whilst also providing the control authority for the Class D airspace which involved liaising with the Director, Zone and LARS controllers for the safe integration of their various tracks through the Class D airspace. In the Supervisor's report he stated that LARS was under a high workload with 2 BS tracks 3 TS tracks under service and 3 TS pre-notes pending. In addition there were also 4 flights on standby. It was whilst assisting LARS that the Supervisor noticed the 7000 squawk at FL45 approaching the C17 from the SE. He asked the U/T APP if he had called the traffic which led to TI being passed, at 0940:42, when APP transmitted, *'c/s, traffic South one mile probably tracking Northeast*

indicating FL45 descending'. At this time the C17 was in a R turn onto a SW'ly track with the Glasair still indicating 600ft above SE of the C17 by 2nm crossing on a NW'ly track. It was at this point that the Glasair commenced descent and lost 500ft in one radar sweep. The C17 crew replied at 0940:52, '*c/s, copied just responding to a TA at moment, standby*'. This was acknowledged by APP.

[UKAB Note (2): During the C17 crew's transmission the radar recording shows (0940:56) the Glasair, having descended another 500ft in the period of the next radar sweep (8sec), descending through FL36 with the C17 descending through FL37 in its 0130 position range 0-4nm crossing R to L. The next radar sweep occurs after the CPA, and shows the Glasair with the C17 in its 8 o'clock range 0-4nm, both ac indicating FL35. Thereafter, lateral separation increases and both ac commence a climb. Taking into account the subject ac's speed and tracks both prior to and post incident it is estimated that the ac crossed with no lateral separation with vertical separation of 100ft or less.]

At 0941:21 the C17 pilot transmitted, '*Just for your info we took evasive TCAS action on him he went the opposite way to our TCAS, we got a rapid descent followed by a rapid climb, but he went underneath by about one hundred feet*'. The TI was subsequently updated with the C17 continuing to Lyneham without further incident.

The Oxford AIAA is not only busy airspace but it is also complicated by controlled airspace that funnels traffic overhead Brize Norton. The Brize Norton CTR Class D airspace is surface to 3500ft amsl which protects large military traffic on climb out and descent but leaves them at risk in Class G airspace whilst conducting a hold. The ability of Brize Norton to provide a LARS is based on irreducible capacity; this was reached with only one LARS controller being available who was working to capacity. This fact as well as the late and inaccurate TI passed by APP were contributory factors that exacerbated the situation, which worsened alarmingly when the Glasair pilot took his own avoiding action.

C17 STATION comments that whilst he believed that the captain of the C17 carried out the correct actions on receiving the TCAS RA, the incident highlights the possible challenges faced when dealing with a (presumably) non-TCAS equipped ac that is taking avoiding action based on visual clues. In this case, it appears the size of the C17 may have led the pilot of the light ac to believe that he was below the C17, when in reality he was above it, and it is fortunate that the descent initiated by the light ac pilot did not result in a more serious incident. Some valuable lessons can be derived from this incident and it deserves wide publication in order to highlight the visual challenges that might occur when avoiding large ac, the continuing importance for TCAS equipped ac aircrew to continue to react to TA/RA information, and the need for non-TCAS equipped ac pilots to understand what RA demands mean and the likely reaction of a TCAS equipped ac. Additionally, whilst TCAS will not drive a lateral displacement, a decision to build in lateral correction would have significantly increased the safety margin in this incident. Finally, although the call from ATC could have been more timely, it does serve to remind aircrew of their responsibilities for taking avoiding action.

HQ AIR (OPS) comments that the Glasair pilot's decision to pass below the C17 by 2-300ft was always going to create a situation by activating TCAS. His assessment that he was at the same level as the C17 was in error and, thus, his plan to descend and pass below the conflict was inappropriate. Passing directly above or below another ac by a few hundred feet is never the best plan, especially one equipped with TCAS. A few degrees of heading change would have allowed the Glasair to pass safely behind, and above, the C17.

NATS SAFETY INVESTIGATIONS DEPARTMENT carried a TCAS performance assessment at the request of the UKAB Secretariat. The assessment was based on single source Mode-S radar data from Clee Hill. The data was recorded by the offline version of the EUROCONTROL ASMT (ATM Safety Monitoring Tool) which is used by NATS to extract and record the Mode-S downlinked TCAS Resolution Advisory (RA) messages generated in the UK FIR. The Interactive Collision Avoidance Simulator (InCAS) tool was used to generate a pair of diagrams [vertical and lateral depiction, not shown] and to provide the ac separation metrics. The simulation interpolates the radar data into 1sec cycles; a process which can lead to differences between the simulated and actual encounters.

Alert Statistics based on InCAS simulation

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C17

Alert Time	Alert Description	Altitude (FL)	Intruder Range (Nm)	Vertical Sep. (ft)
09:40:27	TRAFFIC ALERT	40	3.14	489
09:40:37	MONITOR V/S	40	2.10	507
09:40:41	DESCEND	40	1.70	374
09:40:44	INCREASE DESCENT	39	1.40	264
09:40:46	CLIMB NOW (RCL)	39	1.20	202
09:41:01	CLEAR OF CONFLICT	36	0.24	7

Glasair

Alert Time	Alert Description	Altitude (FL)	Intruder Range (Nm)	Vertical Sep. (ft)
It is assumed that this ac was not TCAS II equipped				

Closest Point of Approach (CPA)

CPA Time	Horizontal Sep. (NM)	Vertical Sep. (ft)
09:40:58	0.05	26

Minimum Lateral Separation

Min. Time	Latsep	Horizontal Sep. (NM)	Vertical Sep. (ft)
09:40:58		0.05	26

Minimum Vertical Separation

Min. Time	Vertsep	Horizontal Sep. (NM)	Vertical Sep. (ft)
09:41:02		0.44	3

The InCAS simulation suggests that the C17 received a 'Traffic Alert' (TA) at 09:40:27 while in level flight at FL40. The downlinked messages from the ASMT confirm that the C17 received a 'Descend' RA at 09:40:37. At this time the ac was in level flight at FL40. (*The 'Monitor Vertical Speed' RA generated in the simulation at this time was not recorded by the ASMT; and so is likely to be an artefact of the simulation process.*) At 09:40:45 the 'Descend' RA was modified to an 'Increase Descend' RA. (*The InCAS simulation suggests that the rate of descent required by the RA would have been at least 2500fpm.*) At 09:40:53 the RA sense was reversed to a 'Reversal Climb' instructing the pilot to stop the descent and instead initiate a climb, ROC 1500fpm. (*The InCAS simulation generated this RA 7 seconds earlier; this is again likely to be an artefact of the simulation process.*) The annunciation for this RA is 'Climb Now': The downlinked clear of conflict message for the C17 was received at 09:41:09.

No further alerts or advisories were received or simulated for this encounter.

The data indicates that the Glasair was Mode-S equipped; however it was not TCAS II equipped. The downlinked messages were also received by Heathrow 10cm, Debden and Pease Pottage. The timing of the received downlinks (when viewed with respect to the radar cycle times) indicates that the downlinks recorded by Clee Hill are accurate to within 1sec of when the RA was generated onboard the C17.

UKAB Note (3): The ANO Rules of the Air Regulations Rule 8 Avoiding Aerial Collisions states: (2) *An aircraft shall not be flown in such proximity to another aircraft as to create a danger of collision.* (4) *An aircraft which is obliged by this Section to give way to another aircraft shall avoid passing over or under the other aircraft, or crossing ahead of it, unless passing well clear of it.*

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Although the onus was on the C17 crew under a TS to avoid other ac, Members were disappointed that Brize APP only passed TI to the C17 flight when separation was about 2nm, after a prompt from the Supervisor, particularly as the position was manned by a mentor and trainee and the C17 was the only flight under their control. Since LARS was working to capacity and had believed that the Glasair was the ac he could see on radar at FL45 above the Class D CTR, he advised the Glasair pilot to free-call London Information. This was unsatisfactory for the Glasair pilot, who remained on the Brize LARS frequency to listen for potentially conflicting traffic.

Turning to the piloting aspects, without any action from either crew, the ac would have passed with the 500ft separation that is to be expected whilst flying under the Quadrantal rule in this Class G airspace. Both crews were responsible for maintaining their own separation from other traffic under see and avoid. The radar recording shows the C17 flying a RH racetrack hold, level at FL40, tracking NE across the Glasair's nose from L to R before turning R on to a SW track to cross the Glasair from R to L. Both ac would have been visible to each other for some time, albeit the small size of the Glasair would make it more difficult to see. The C17 crew did not see the Glasair until it was passing beneath and the Glasair pilot reported only seeing the C17 after it had turned R on to SW and following him being 'heads in' selecting a frequency. Unfortunately, the Glasair pilot's perspective of the relative geometry of both ac led him to believe that the C17 was at the same level as his ac. Being unfamiliar with the C17's size, this large ac when seen close by, 1-2nm range, and perhaps showing some belly if, contrary to the Glasair pilot's perspective, it had not yet rolled out on track, appears to have given the false impression of being at a similar level. However, Members could not understand the rationale behind the Glasair pilot's decision to fly directly underneath the C17 without building in any lateral separation. This descent by the Glasair pilot had placed it into conflict with the C17 and had caused the Airprox.

The Glasair's descending flight path towards the C17 generated a TCAS RA 'descend' instruction on the C17 flight deck, with which the crew were required and correct to comply. As the Glasair pilot steepened his descent to pass beneath the descending C17, the RA command in the C17 strengthened to 'increase descent' before reversing to 'climb now' as the Glasair descended through its level. Although the C17 crew responded to the RA 'climb' demand immediately, they were still descending when the 2 ac crossed, showing at the same level on the next radar sweep afterwards.

Members agreed that the uncoordinated avoiding action – only one crew responding to TCAS whilst the other pilot was taking visual avoiding action - had been ineffective. The C17's TCAS-demanded descent had forced the Glasair pilot into the unenviable position of steepening his descent into a high-speed dive (1000ft in 2 radar sweeps - 16sec - equates to 3750fpm). This left the Board in no doubt that the combined actions of both crews had created a situation where an actual risk of collision existed.

This Airprox provides a salutary lesson for all aviators to consider when operating in the vicinity of ac that might be TCAS equipped. Aircrew who fly ac equipped with TCAS would be aware of the capabilities of TCAS, but those who have had no exposure to TCAS could be unaware of the implications of manoeuvring towards a TCAS-equipped ac. The DARS Advisor offered to publicise this Airprox through MoD channels and the Director agreed to write to the Chairman of the CAA Aviation Communication and Education Programme (ACEP).

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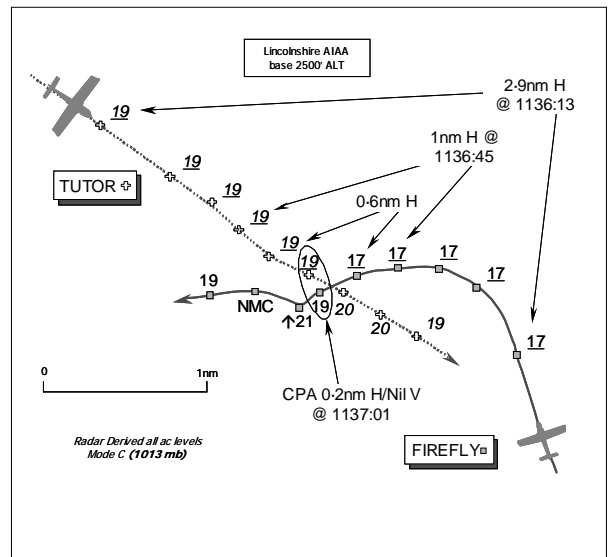
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Glasair pilot descended into conflict with the C17.

Degree of Risk: A.

AIRPROX REPORT NO 2009-045

Date/Time: 2 June 1137
Position: 5255N 00016W (10nm SE of Cranwell)
Airspace: London FIR (Class: G)
Reporting Ac Reported Ac
Type: T67M Firefly Grob Tutor
Operator: HQ Air (Trg) HQ Air (Trg)
Alt/FL: 2000ft 2000ft
RPS (1023mb) RPS
Weather VMC CAVOK VMC
Visibility: 50km+ 10km+
Reported Separation:
100ft V/0.3nm H Not seen
Recorded Separation:
Nil V/0.2nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE T67M FIREFLY PILOT, a QFI, reports conducting an elementary instructional sortie with a student in CAVOK conditions with no cloud. The QFI was demonstrating an emergency handling aspect and the RT was selected to Cranwell APPROACH (APP) although no recovery call had yet been made as they had just switched frequency from Cottesmore LARS (ZONE) on 130.20MHz. A squawk of A2641 was selected with Mode C on; Mode S is not fitted.

Heading 260° at 123kt flying out of Sun straight and level at 2000ft Barnsley RPS (1023mb) whilst initiating a RTB at Barkston Heath, the student PNF sighted another ac – a white Tutor with HISLs - in their 2 o'clock – low, very close (0.5nm) eastbound and crossing obliquely from R - L. Realising there was a confliction, the student PNF called "aircraft break left". Immediately the QFI performed an emergency L 'Break' with full power to initiate a climb. After they had rolled out of the 90° turn the QFI sighted the Tutor passing through their 7 o'clock still heading in its original direction with vertical separation at that stage of about 250ft.

Minimum separation was estimated at 100ft vertically and 0.3nm horizontally. Stressing that it was the student pilot that had called the 'break', the QFI was not visual with the other ac beforehand and the Risk was assessed as "medium". No report was filed on RT but the Radar Supervisor at Cranwell was contacted upon landing.

The ac is coloured yellow with black under surfaces and the HISLs were on.

THE TUTOR PILOT, a QFI, reports that he was conducting a VFR local area familiarisation sortie whilst instructing the 'Effects of Controls 1'. He was operating on a quiet frequency – Cranwell Stud 7 – and a squawk of A2641 was selected with Mode C on. Mode S is fitted.

Whilst general handling at 100kt about 10nm S of Cranwell at 2000ft RPS, at no stage did he observe any ac that required avoiding action to be taken, despite a good lookout being maintained throughout. The ac is coloured white and the HISLs were on.

DAATM reports that whilst recovering under VFR to Barkston Heath from the SE the Firefly crew was in receipt of a BASIC Service from Cottesmore ZONE before free-calling Cranwell APP for the airfield information prior to recovering to Barkston Heath. Whilst conducting the local area familiarisation flight to the SE of Cranwell the Grob Tutor crew was not under an Air Traffic Service. Both ac were squawking A2641 with verified Mode C: A2641 is the VFR conspicuity code for ac climbing out or descending into the Lincolnshire 'Agreed Airspace' [not the AIAA] - an area of defined lateral dimensions that extends vertically from 4000ft Cranwell QFE to FL190 excluding controlled airspace and operates on an H24 basis.

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At 1133:03, the Firefly crew transmitted on 130.20MHz to Cottesmore ZONE “[C/S] *en route switching squawk 2641 chopping to stud 5 Cranwell Approach*”, which was acknowledged by the ZONE Controller. The Firefly crew established RT contact with Cranwell APPROACH (APP) on 338.775MHz (Stud 5) 6min later at 1139:38, “*APPROACH this is [Firefly C/S] request visual recovery to join overhead with Charlie*”. APP replied, “[C/S] *Charlie correct no radar traffic*”. At 1139.53 the Firefly crew transmitted, “*...field in sight Stud 11*”, which is the Barkston Heath TOWER frequency.

The LATCC (Mil) radar recording shows the Firefly at 1134:07 some 14nm SE of Cranwell with the Tutor at 11 o'clock – 10.5nm crossing L - R. The Firefly crew had already left the Cottesmore frequency and was operating autonomously. At 1137.01, the CPA of 0.2nm occurs with both ac's Mode C indicating 1900ft (1013mb), but it was not until 1139:38 that the Firefly crew contacted Cranwell APP.

It would not have been apparent to the Cottesmore ZONE controller that the Tutor would pose a threat at the time that the Firefly was released to call Cranwell APP en-route. Additionally the BASIC Service that Cottesmore ZONE was providing would not have required that the traffic be called. The Firefly crew was operating beneath the base of the Lincolnshire AIAA [2500ft ALT – FL180] and did not request an ATS from Cranwell APP until 1139:38. The Airprox occurred at 1137:01 during the 6min period that the Firefly crew was operating autonomously.

UKAB Note (1): Analysis of the LATCC (Mil) Radar recording shows the Firefly flown by the reporting pilot commencing a L turn at 1136:13, subsequently maintaining level flight at 1700ft verified Mode C (1013mb) – equating to about 2000ft RPS (1023mb). The Grob Tutor, identified from its Mode S ac identity, is shown maintaining a SE'ly course converging on the Airprox location - some 10nm SE of Cranwell – level at 1900ft verified Mode C (1013mb). The Firefly steadies on a track of broadly 260° as the two ac close to a range of 0.6nm – just before the point that the Firefly crew potentially first sighted the Grob Tutor. However, the Firefly's Mode C indication of 1700ft (1013mb) suggests that the Grob was 200ft above the reporting pilot's ac and at variance with the reporting pilot's account that the Grob was first seen in their 2 o'clock – low, very close (0.5nm). The two aeroplanes close to a minimum range of 0.2nm at the CPA when the Firefly is shown climbing through the level of the Grob - 1900ft Mode C, when the avoiding action L break is barely evident. The Firefly ascends to a maximum indicated level of 2100ft (1013mb) – some 100ft above the Grob – which itself is shown at 2000ft Mode C, before the Firefly reverses sharply to the R, resumes its course and descends towards Barkston Heath.

UKAB Note (2): Subsequent to the review of the radar recording the Firefly pilot's unit was contacted about the apparent anomaly of the vertical disposition of the two ac when the Student PF first spotted the Grob Tutor at close quarters. The student pilot reaffirmed that the Grob Tutor was below the Firefly when first seen. Whilst both ac Mode Cs are deemed verified, the applicable tolerance is +/-200ft between the pilot reported level and that indicated on Mode C at the instant they were viewed by the controller, therefore, it is entirely feasible that the Grob was situated below the Firefly.

HQ AIR (TRG) comments that it is disappointing that only one person out of the four involved in this occurrence saw the other ac before the event. It can be difficult to see other ac in CAVOK conditions and crews need to conscientiously maintain lookout during airborne teaching sorties where cockpit instruction could detract from routine and or standard procedures. In this case the Firefly Student PNF was maintaining lookout and was able to alert his QFI PF in time 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 frequency, radar video recordings and reports from the appropriate ATC and operating authorities.

It was evident from the Firefly QFI's account that the Tutor had been spotted by the Student PNF in their 2 o'clock, low, at close range - some 0.5nm away it was reported - before she promptly took robust action to avoid the other ac, although unsuspected to the 'threat' at the time. The Board commended the student pilot for his prompt action at this critical moment and it was evident that the student's warning to his instructor, the latter's presence of mind and quick reaction undoubtedly all played their part in resolving this difficult close quarter's situation – a salutary example of good 'crew co-operation'. Clearly the Firefly crew had an implicit responsibility under the 'Rules of the Air' to see and take effective action to avoid traffic to starboard. However, in the prevailing CAVOK conditions the Board considered that the Tutor should have been spotted earlier than it was. It was readily evident to the pilot Members, therefore, that the Firefly crew's late sighting was part of the Cause.

The 'Rules of the Air' depend on ac being spotted in time; however, in the other cockpit the Tutor QFI reported that he was maintaining a good lookout but did not see any other ac that required avoiding action to be taken. Whilst recognising that the QFI was teaching a very basic lesson which would have demanded close attention to what his student was doing, it seemed inconceivable that he would not have reacted to another ac crossing the nose at the ranges illustrated by the radar recording here if he had seen it. Clearly in the see and avoid environment of the 'Open FIR' there was still an implicit responsibility on the part of the Tutor crew under the 'Rules' to remain clear of other traffic when operating under VFR. Thus, in the Board's view, non-sighting by the Tutor crew was the other part of the Cause.

Turning to the inherent Risk, the Board could not resolve the apparent anomaly of the vertical disposition of the two ac. The Student PF reaffirmed that when first spotted the Tutor was below their Firefly, whereas the radar recording clearly suggested that the Tutor was 200ft above the Firefly at the outset. Such anomalies are rare. In fact TCAS relies on the accuracy of Mode C to provide separation in the vertical plane. Clearly if the Firefly had been below the Tutor and the Firefly QFI had climbed through the Tutor's level unsighted, this would have seriously increased the risk of a collision. However, the Board took the Student pilot's assessment, as the only one of the four individuals involved to spot the other ac beforehand that the Tutor was below the Firefly when first seen; the tolerances applicable to Mode C, radar data update rates and Mode C lag made this feasible. Nevertheless, at a CPA of 0.2nm – somewhat less than that reported - with only the Firefly student sighted as his instructor executed the climbing 'Break' and neither occupant of the Tutor aware of the ac unseen ahead, there was unanimous agreement by the Members that the safety of the ac involved here was indeed compromised.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Non-sighting by the Tutor crew and late sighting by the Firefly crew.

Degree of Risk: B.

AIRPROX REPORT No 2009-046

AIRPROX REPORT NO 2009-046

Date/Time: 5 June 1450

Position: 5054N 00128W (7nm SW of SAM)

Airspace: SOLENT CTA (Class: D)
R41 (Class: A)

Reporting Ac Reported Ac

Type: B737 PA34

Operator: CAT Civ Trg

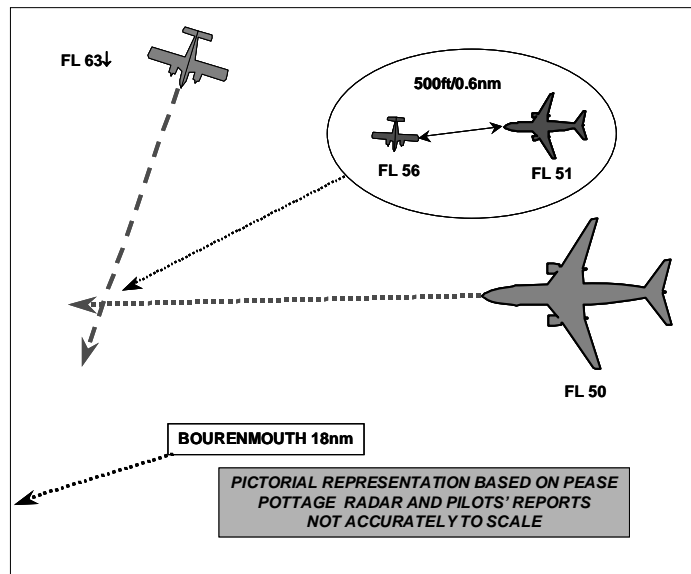
Alt/FL: 5000ft 5500ft
(QNH 1008mb) (QNH 1007mb)

Weather VMC Haze VMC CLAC

Visibility: 10km >10km

Reported Separation:
1000ft V/5m H 7-800ft V/<1nm H

Recorded Separation:
700ft V/0.2nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

UKAB Note (1): Although the B737 pilot reported that he was flying on a QNH of 1008mb, the transcript shows that he was instructed to change QNH to 1007 at 1447:20.

UKAB Note (2): All alts on the diagram based on the SPS.

THE B737 PILOT provided a brief report stating that he was inbound to Bournemouth on a scheduled passenger flight squawking as directed with Mode C and flying level at an alt of 5000ft and heading 270° at 230kt when they received a TCAS TA on a contact less than 5nm away in their 1 o'clock. Although they anticipated an RA no further alert was displayed so they took no avoiding action and assessed the risk as being low.

UKAB Note (3): The transcript of the Solent Radar (RAD) frequency shows that the B737 pilot reported at 1450:20 "C/S TCAS Descent" which was correctly acknowledged by RAD saying "Roger". This descent can be seen on the radar recording after the ac cross.

THE PA34 PILOT reports that he was the ac commander, sitting in the RHS seat of a blue and white ac with strobes switched on. The sortie was an instrument training flight (IFR) from Oxford to Bournemouth with the student flying with instrument flying screens erected. They were receiving a RCS from Solent RAD on a radar heading of 200°, descending from FL70 to 6000ft QNH and, while he was writing notes on the student's performance earlier in the flight, he did not immediately notice that ac had descend through 6000ft. He became aware of a twin-jet passenger ac in their 4 o'clock position less than 1nm away, about 7-800ft below them and climbing. On checking the altimeter he saw they were at 5500ft and so he instructed the student to climb immediately and at the same time Solent RAD instructed them to climb to 6000ft and turn onto heading 170°.

Shortly after, and on instruction from RAD to "resume own navigation to the BIA, altitude 5000ft", the student turned the ac onto a heading of 270° and commenced a descent. Then 3min later RAD instructed them to turn immediately to heading 350°, apparently to avoid another ac at the same level 4nm ahead; this was followed by an instruction to turn to 260°. One min later they were handed over to Bournemouth APR.

With hindsight he considered that he had diverted his attention away from monitoring the student's flying at an inappropriate time. He assessed the risk as Medium.

THE SOLENT RADAR CONTROLLER (RAD) reported that he was operating as the Solent RAD ATCO and was mentoring a trainee. A B737 inbound to Bournemouth was level at 5000ft on the QNH of 1007mb and heading towards their delegated airspace. Meanwhile a PA34 was No2 to the B737 and was descending to Alt of 6000ft

(which he believed was read back correctly), heading SW on a converging track. As the PA34 approached 6000ft its label garbled with another ac but he noticed it indicate 5900ft, so he moved the label to see it more clearly. He then noted that it indicated 5800ft so he told the trainee, who was on the RT at the time, to *"Watch its level"*. The PA 34 indicated 5600ft as the R/T became free but before he could give avoiding action to the B737, its pilot reported a TCAS descent. RAD ATCO gave the PA34 an 'avoiding action' turn to the SE.

The trainee gave the B737 a heading change before he had reported the TCAS-demanded manoeuvre complete, although this was a few sec after the TCAS event and the PA34 was now clearing to the SE. RAD ATCO informed the B737 crew that TCAS had been due to crossing traffic descending through its cleared level, and asked them if they wished to file an Airprox; they said that they would after the next sector.

ATSI reports that the incident took place in Class D airspace of the Solent CTA (2000 – 5500ft amsl) and Class A airspace of airway R41 (5500ft amsl – FL195) (immediately above). At the time of the incident Southampton Radar and Solent Approach were combined on a single frequency and a mentor and trainee controller were operating the position. The radar equipment in use was Pease Pottage.

At 1439 the PA34 established communications with RAD; the pilot reported maintaining FL70 then RAD instructed him to *"...fly heading 210 degrees"*. A further heading change to 200° was given at 1443 and both instructions were correctly acknowledged and complied with.

The B737 established communications with RAD at 1441, the pilot reporting maintaining FL90 inbound GWC. RAD instructed the pilot to descend to FL80 and shortly afterwards, at 1442, he was instructed to *"...leave er Goodwood heading 285"*. The radar recording shows that there were several Eastbound departures from Southampton Airport and the heading instruction to the B737 would facilitate separation against the other traffic. The B737 crew was given several more heading and level instructions against the ac departing Southampton and by 1448:39 had been instructed to descend to, and was maintaining, 5000ft on the QNH of 1007. The B737 was then lower than the PA34, which was maintaining FL70. At 1448:39 the PA34 was 3.7nm WNW of Southampton Airport and the B737 was 8nm to the SE.

At 1448:40, RAD instructed the PA34 pilot to *"...descend to altitude 6000ft, the QNH 1007"*, and this was read back correctly. Thirteen sec later the radar showed that the PA34 was at a range 2nm in the B737's 1 o'clock position and at an Alt of 6300ft. A further 20 sec later an STCA level 1 alert activated when the levels of the PA34 and B737 were 5900ft and 5100ft respectively. It is noted that MATS Part 1, Section 1, Chapter 5, (Paragraph 9.3.1 (a)) states:

"An aircraft may be considered to be at an assigned level provided that the Mode C readout indicates 200 feet or less from that level";

therefore, at this time, the levels of the ac were within the permitted tolerances.

At 1450:17 the radar showed that the PA34 had descended further to 5800ft; it was then in the B737's 12 o'clock at a range of 0.8nm, with 700ft vertical separation. At 1450:20, simultaneous transmissions are heard on the frequency: (i) the B737 stated *"... TCAS descent"*; and (ii) RAD is heard to say *"[PA34 C/S]..."* – followed by several unclear words.

The PA34's altitude then reduces further to 5600ft and at 1450:27 a level 2 STCA alert activated.

The Mentor took the RTF from the Trainee at 1450:30 and issued avoiding action to the PA34 as: *"C/S avoiding action turn left heading one seven zero degrees"*, this was read back and immediately followed by a further instruction to *"...climb immediately altitude six thousand feet"*; again this was read back correctly.

There then followed a momentary loss of the Mode C data on the PA34, the data returning at 1450:41 showing 1100ft separation between the ac (the PA34 at 5800ft and the B737 at 4700ft) with the PA34 in the B737's 8 o'clock 0.7nm away. From that point onwards standard vertical separation was maintained.

The trainee controller resumed the RTF at 1451:00 and issued a turn to the B737 but the pilot had not called 'clear of conflict' at that stage; however, the B737 did not call 'clear of conflict' on the RT at any stage. The Mentor noted the action of the Trainee, which is contrary to the MATS Part 1 instruction stating:

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When a pilot reports an ACAS RA, controllers shall not attempt to modify the aircraft (sic) flight path until the pilot reports "Clear of Conflict".

As the trainee issued the instruction the radar showed the PA34 was then about 2.5nm behind the B737 in its 7 o'clock position. Lateral separation then continued to increase.

The development of this incident was such that the RAD controller would not have been able to prevent it from occurring. Appropriate avoiding action was given and there were no apparent implications for ATC.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board was concerned by the incomplete and inaccurate report provided by the B737 pilot but noted the full and frank one given by the PA34 instructor stating that he had diverted his attention from monitoring the student at an inappropriate moment. A flying instructor Member advised that when instructing there can often be conflicting instructional and monitoring requirements but it is important to prioritise tasks such that safety critical supervision always takes place. Notwithstanding that the student was flying the ac under IFR, the instructor was the pilot in command and must, as he did, accept responsibility for the descent below the cleared alt of 6000ft.

Since both the PA34 instructor and the Solent Controller almost simultaneously recognised the alt deviation and acted swiftly to restore standard separation, Members agreed that there had been no risk of collision.

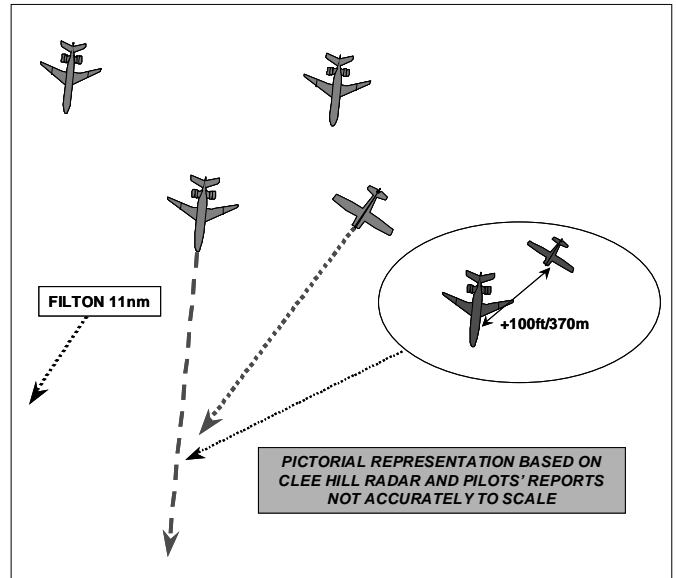
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The PA34 instructor allowed his student to descend below their cleared level into conflict with the B737.

Degree of Risk: C.

AIRPROX REPORT NO 2009-047

Date/Time: 3 June 1720
Position: 5140N 00224W (11nm NE Bristol Filton)
Airspace: Lon FIR (Class: G)
Reporting Ac Reported Ac
Type: C172 VC10
Operator: Civ Club HQ Air (Trg)
Alt/FL: 2600ft 2800ft
(RPS 1016mb) (RPS 1016mb)
Weather VMC NR IMC@VMC NR
Visibility: >20km >10km
Reported Separation:
100-150ft V/200m H 200ft V800m H
Recorded Separation:
- 100ft V/0.2nm (370m) H (see UKAB Note (2))



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE C172 PILOT reports he was flying a local VFR training flight from Gloucestershire, with strobes and nav lights switched on, squawking 7000 with Mode C; his student was flying the ac and they were receiving a Basic Service (BS) from Gloucester APP. They were tracking towards the OF NDB at Bristol Filton on a track of 218° and at an altitude of 2600ft on the Cotswold QNH of 1016mb. At 11.2 DME from the beacon he was about to instruct his student to turn to track the reciprocal bearing when a VC10 overtook them to their right and above at high speed and close range; he estimated it to be no more than 50m above and at a distance of no more than 200m horizontally. As a result of the closing angle the VC10 was initially sighted only after it had passed abeam them; he estimated its track to be 200° and it crossed their track from right to left and ahead of them.

He was concerned about the possibility of wake turbulence so he took control immediately and banked the ac hard to the left and rolled out for 3-4min on an Easterly heading before turning back inbound the OF NDB to allow any wake turbulence to dissipate. After another 1-2min they felt 2 separate bumps as they flew through what he concluded were the residual wingtip vortices. He noted the time that the vortices were felt as 1725 (i.e. 5min after the initial crossing).

On his return to Gloucester he contacted Brize Norton ATC and conveyed his concern about the proximity of their ac and he was informed that the VC10 was one of three on the approach to, and receiving a Traffic Service from, Brize.

He did not assess the risk of collision but he expressed concern that he was apparently “invisible” to Brize and Gloucester ATC and to the VC10's TCAS.

THE VC10 PILOT reports he was flying the lead ac of a 3-ship IFR to VFR recovery from RAF Marham to RAF Brize Norton for a timed flypast and were in receipt of a TS from Brize Radar. While breaking cloud at 2800ft, flying at 250kt about 30nm SW of Brize, Radar informed them of conflicting traffic but no alt was given and the traffic was not displayed on their TCAS. Shortly after a white high wing Cessna type ac was seen at a range of 1nm and about 200ft below them; he alerted the rest of the formation on a discreet frequency, resulting in all the crews seeing the light ac.

The light ac appeared to be in a left hand turn, turning away from the formation and no avoiding action was taken, as there was little/low risk of collision. He was not informed of the Airprox until several days later when Brize ATC called him.

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UKAB Note (1): The recording of the Clee Hill Radar shows the C172 SSR as intermittently displaying 0000 (SSR Data unreliable – possibly a transponder fault), which might explain why it was not displayed on the VC10's TCAS.

UKAB Note (2): The Clee Hill radar recording shows the incident. The C172 is squawking 7000 with Mode C and the lead Tanker 3741 with Mode C. As the recording starts at 1715, the Tanker formation has exited the Daventry corridor and descended to FL40 tracking W; they are already overhead the traffic on which TI was passed by DIR shortly after 1714. Meanwhile the C172 is about 20nm NNE of Filton tracking inbound to OF at FL026 with the formation about 10nm NNE of it. As noted above the C172's SSR data shows 0000 for short periods throughout the recording. At 1716:14, while due N of the C172, the formation, still at FL40 commences a slow left turn onto S and all 3 elements (in very loose vic formation) show. At about 1717:45 the formation is 12nm N of the C172 (still at FL026) tracking in a Southerly direction towards it. At 1718:45 while 5nm in the C172's 4 o'clock and closing quickly the formation, now with individual squawks (though No3 shows as a primary only), commences a descent from FL40. The formation continues to descend and close on the C172, crossing from its 4 o'clock to its 10 o'clock. The lead ac passes 100ft above (on the sweep of the CPA indicating reliable Mode C – 7000 FL026) the C172 and 0.2 nm ahead of it. Both other VC10s are well clear.

ATSI reports that the controller involved subsequently left the Company and had no recollection of the event. At 1702, a VC10 established communications with 'Gloster' with the pilot saying, *"Good evening (callsign) 'three' is one of three VC 10s lead callsign 'one' er we're currently in the Daventry Corridor Flight Level one hundred approximately ten minutes exiting the Corridor and we'll be routeing east to west just north of the airfield descending from ten thousand down to six zero"*. The controller who was operating combined TWR and APP, advised there was no known traffic to affect and asked if a service from Gloster was required. An agreement was reached that Gloster would provide a BS and the flight was requested to report passing "north abeam" (the airport). Meanwhile a C172 was taxiing at Gloucestershire Airport for a VFR departure to the SW and was cleared for take-off on RW04 at 1706, with an instruction to make a left turn out. About 3min later, the controller transmitted *"(callsign) Basic Service Cotswold (RPS) 1016 call for rejoin"*, which was read back correctly. The C172's pilot reported no level information. At 1714 the same VC10 reported, *"...er three aircraft descending to four thousand sorry Flight Level four five about er three miles north"*. The controller responded by issuing the formation TI on a Gloster departure (not the C172) that was tracking NW; in turn, the departing ac was also warned of the VC10 formation. At 1716:30, the VC10 transmitted simply *"Three's Out"*, which was acknowledged by the controller. Thereafter, up to the end of the RTF extract at 1727, there were no further transmissions from either the subject C172 or any aircraft within the military formation.

Details of a BS are in MATS Part 1, Section 1 and it is defined as:

"...an ATS provided for the purposes of giving advice and information useful for the safe and efficient conduct of flights. This may include weather information, changes of serviceability of facilities, conditions at aerodromes, general airspace activity information, and any other information likely to affect safety. The avoidance of other traffic is solely the pilot's responsibility.

Basic Service relies on the pilot avoiding other traffic, unaided by controllers. It is essential that a pilot receiving this service remains alert to the fact that, unlike a Traffic Service and a Deconfliction Service, the provider of a Basic Service is not required to monitor the flight".

In addition it states:

"Pilot's should not expect any form of traffic information from a controller, as there is no such obligation placed on the controller under a Basic Service outside an Aerodrome Traffic Zone (ATZ), and the pilot remains responsible for collision avoidance at all times. However, on initial contact the controller may provide traffic information in general terms to assist with the pilot's situational awareness. This will not normally be updated by the controller unless the situation has changed markedly, or the pilot requests an update.

The Gloster TWR/APP controller had no information to indicate that the subject aircraft would represent a risk to each other. There are, therefore, no apparent implications for Gloster ATCU in this incident.

MIL ACC reports that a formation of 3 VC10s was recovering to RAF Brize Norton under a TS from DIR for a timed flypast at 1730. They were handed over from LJAO having transited the Daventry Corridor; initial contact was made with DIR at 1709:45, *'Brize Director C/S combine formation 3 aircraft approaching Daventry West Point'*. An

initial descent to FL070 with a request to route around the N of Gloucester was passed and the formation leader was requested to report ready for further descent. At 1713:44 leader transmitted, *'C/S request descent FL040'*, this was approved and acknowledged by the pilot. Thirty secs later DIR transmitted, *'C/S pop-up traffic directly beneath you indicating 2000ft below'*. The pilot acknowledged this and the TI was updated at 1715.25, *'C/S that traffic now in your 6 o'clock 2 miles slow moving Northbound no confliction'*. [UKAB Note (3): This was not the C172 involved]. The formation leader then requested a left turn and was given own navigation. At 1716:49 a transmission was made believed to be from the No2 pilot, *'and C/S2 and C/S3 are out request squawk'*; this transmission was clipped and slightly broken. DIR confirmed that the formation wished to split and transmitted at 1717:04, *'C/S1, C/S2 squawk 3742 and C/S3 squawk 3743'*, the respective pilots acknowledged their squawks. At 1717:42 DIR transmitted TI on traffic believed to be the C172, *'C/S Combine traffic South 5 miles slow mover Southbound no height information'* but this was not acknowledged. At 1718:22 the formation leader reported, *'C/S descending 3000ft'*, this was acknowledged by DIR who also passed the RPS of 1016. The formation leader acknowledged the RPS and at 1718:34 DIR confirmed, *'C/S Combine by your last call are you still MARSAs or have you lost contact with each other'* and the leader replied *'Still MARSAs C/S'*. Director then passed further TI on the C172 at 1718:53, *'C/S Combine traffic South 2 miles westbound slow mover no height'*. [UKAB Note (4): The recording of the Cleve Hill Radar shows a Mode C reading of FL026 at this time but the DIR's display was showing primary and SSR data from the Brize head. See also Note 1]. Several more admin calls were made before at 1720:51 DIR requested, *'C/S flight what is your next turning point. You're currently 6 miles Northeast of Filton tracking south'*, the leader replied, *'We're currently heading 210 and will shortly be turning left'*. DIR acknowledged saying, *'Roger remain outside controlled airspace the Bristol controlled airspace to the South'*. The formation acknowledged at 1721:07 by saying, *'Copied coming left now'*. At 1722:32 DIR transmitted, *'C/S Combine traffic East 7 miles slow mover Northbound indicating slightly above'* [not the C172] and the formation recovered to RAF Brize Norton without further incident.

The conflict occurred in Class G airspace while the Brize Norton DIR was providing the VC10 formation with a TS. The relevant TI was passed and updated which allowed all 3 of the VC10s to acquire the C172 visually.

HQ AIR (OPS) comments that three VC10s in formation is quite an unwieldy beast. However, the TS given to the crews ensured that they all became visual with the Cessna and were content that their respective flightpaths would keep them 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, a radar video recording, reports from the air traffic controllers involved and reports from the appropriate ATC and operating authorities.

The Board noted that the VC10 lead crew were most likely very busy leading the formation down through a layer of cloud while navigating to ensure a timely arrival at Brize Norton. Specialist Members opined that the formation would have had little flexibility to adjust their routing if they were to achieve the desired over-flight time at Brize, and this routeing had taken the leader fairly close laterally to the, initially unseen, C172. Controller Members discussed why the otherwise accurate TI passed by the Brize Controller had no alt information regarding the C172; they accepted the explanation offered by the MIL ACC Advisor that there had been no Mode C information displayed to him from the Brize Radar (although it showed intermittently on the Cleve Hill recording). Had such height information been available to the VC10 leader, Members agreed that it was unlikely that he would have flown so close (vertically) to the C172, cloud base and terrain permitting.

Members were concerned by the C172 pilots remark that *'he was apparently "invisible" to Brize and Gloucester ATC and to the VC10's TCAS'* and examined his points in turn. Gloster APP do not routinely make use of their limited performance radar and, as stated in the ATSI report, this was the case at the time of the incident; further the C172 pilot was in receipt of a BS from them and, as noted above, there is no obligation on controllers to provide TI when giving this type of service. Also as noted above, the C172 was not unseen by the Brize Controller, who passed accurate positional information to the VC10 formation regarding it; unfortunately the controller did not have any Mode C data available to him so he was not in a position to give any alt information. That the VC10 lead pilot reported that *'no traffic displayed on his TCAS'* was of some concern, particularly since the C172 pilot had his SSR switched on in order to make him 'visible' to both controllers and TCAS systems. Since his SSR showed intermittently 0000, sometimes with no Mode C data, and the SSR returns, also intermittently, were some distance (about 1nm) from the primary radar responses, specialist Members considered that there had probably been a

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fault with the C172's SSR equipment that caused it to be undetected by the VC10's TCAS. A specialist GA Member recommends all GA pilots to check the performance of their SSR equipment periodically and regularly by requesting confirmation of squawk and altitude with a radar-equipped ATC unit.

When assessing the collision risk, Members noted that the VC10 pilot had seen the C172 turning away one mile ahead of him and considered that no further avoiding action was needed. Although he slightly overestimated the separation that would be achieved, Members agreed that, while there may have been a wake turbulence consideration, there had been no risk of collision.

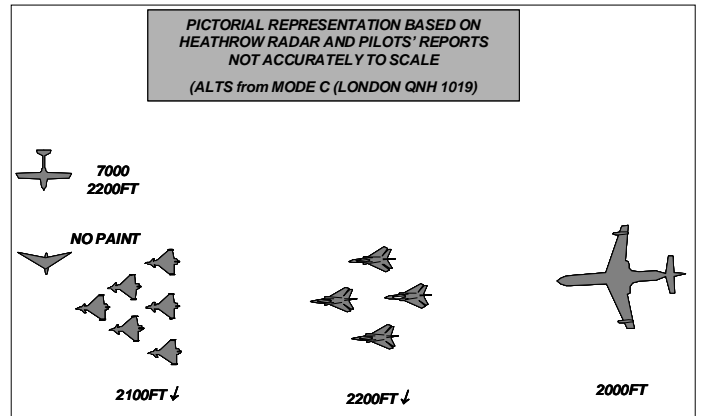
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The VC10's flightpath caused the C172 pilot concern.

Degree of Risk: C.

AIRPROX REPORT NO 2009-048

Date/Time: 13 June 1209 (Saturday)
Position: 5147N 00107W (10 nm N Benson)
Airspace: London FIR (Class: G)
Reporting Ac Reported Ac
Type: Typhoon Ikarus C42
Operator: HQ Air (Ops) Civ Pte
Alt/FL: 2000ft 2500ft
(QNH 1019mb) (QNH 1019mb)
Weather VMC CLOC VMC
Visibility: >10km >10nm
Reported Separation:
100ft V/300ft H 1000ft V/1m H



Recorded Separation:
400ft V/ 0.7nm H (700 ft V /0.2nm H against the GR4s -see UKAB Note (2))

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE TYPHOON PILOT reports flying a Typhoon ac at 269kts, with no TCAS fitted but squawking 6504 with Mode C and red strobe lights on, leading a large mixed formation of military ac for Queen’s Birthday flypast that took place over central London. The event was the subject of a NOTAM, and ACN and a RA(T) covering the route [see UKAB Note (3)]. The incident took place after the flypast when the formation was about to split and disperse (but was still within the RA(T)). At the time the formation consisted of 6 Typhoon ac in close formation (followed in trail by 4xGR4s then 16 other ac).

On handover from Luton to Brize DIR a contact was called as a 2-ship in their 1 o’clock at ½nm and at similar height. About 10sec later, he (the leader) saw a dark winged, Microlight/Paraglider ½nm away in his 1 o’clock position, approximately 100ft above, spaced by 300ft horizontally and heading South. He called the ac to ATC, and started a descent with the 6-ship Typhoon Element. He only ever saw 1 ac of the reported 2-ship conffliction.

On landing at Coningsby, the 4-ship formation of Tornado GR4s, who at the time of the incident were also in close formation about 2nm behind the Typhoons, reported that they had also had an Airprox with a microlight but they reported seeing 2 (microlight) ac close together. They also had to take avoiding action.

He reported the incident to Brize ATC and assessed the risk as being very high.

UKAB Note (1): The entire formation (at the time) consisted of 26 ac in various groups in trail; front to back was a distance of 13nm. Due to the size of the individual sub-formations, they would have been difficult to manoeuvre when compared with singleton ac.

THE IKARUS C42 PILOT reports flying a white and red fixed wing microlight with SSR (with Mode C and Mode S elementary), TCAS and a red strobe light switched on, on a private VFR flight. He was contacted some time after the event but, whilst he had retained his VFR Flight Log sheets with details of NOTAMs etc, unfortunately by that time he had deleted his track line, checkpoint ETAs and ATAs.

The flight was the second leg of a journey to Sandown IOW from Husbands Bosworth routing overhead Finmere, Greenham Common and Popham.

The NOTAMs relevant to his flight concerned the Queen’s Birthday Flypast which crossed their track to the East of Oxford and the Red Devils display on the IOW in the evening. He had used AIC M030/2009 to plot the RA(T) on the chart. Unforeseen delays on the ground at Husbands Bosworth meant that his departure was much later than planned. Another ac at Husband Bosworth had suffered radio failure and he agreed to “Buddy” him to the

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IOW. The plan was for him to fly behind the other ac (as it was slower) then overtake after crossing the Solent, to lead as a pair into Sandown.

The 'set heading' time at Hus Bos was 1225 and the boundaries of the RA(T) were at 37nm and 42nm respectively. At the original planned speed of 75kt, he would have been clear of the RA(T) before the scheduled time [for that segment], but following the other ac at only 60kt had meant that he would be crossing the RA(T) during the scheduled time. He would therefore need to be above 2500ft AMSL whilst between the lateral boundaries (Area G)

As he approached the Northern boundary of area "G" of the RA(T) he was below 2000ft as he was having difficulty keeping sight of the other ac. He began a climb to 2500ft keeping a good lookout left for the expected traffic. He was squawking 7000 Mode C to assist with TCAS. He saw the lead formation of Typhoons at about 5nm. They passed well ahead and below, followed by the Tornados and well behind them a Tanker and outriders. He did not consider there was any chance of a collision or need to file an Airprox.

UKAB Note (2): Although the above report was provided by the rear (white and red fixed wing) microlight pilot who was the flight leader, albeit from behind, based on the pilots' reports the actual Airprox was with leading (dark flexwing) Microlight. It follows therefore that the recorded CPAs in the data block above are with the squawking ac not the flexwing that at the time did not show on radar, but was most likely significantly closer both horizontally and vertically. The pilot of the front Microlight would not have known that the leader (behind him) was climbing to 2500ft to clear the top of the RA(T) as they were not in RT contact. Further, the RT transcript shows that Nimrod pilot reported to DIR that the ac was a '*paraglider*' at 2000ft, exactly on their track and at the same alt.

THE BRIZE CONTROLLER (DIR) reports that Luton Radar handed the formation over in a timely and routine manner; the formation was under a TS and at the time of the handover and initially no conflicting traffic was observed. The formation elements took some time to make contact on frequency, however, all ac eventually checked in. After putting the formation under a TS, the Brize QNH was also passed and the formation proceeded on its pre-briefed track from RAF Halton to RAF Brize Norton within the NOTAMed RA(T). Conflicting traffic, 2 contacts, believed to be in formation, were called to the Typhoon formation leader; Brize DIR also endeavoured to relay the traffic information to the individual elements of the formations following the Typhoons. This traffic was called a number of times before and up to the point of conflict, including indicating that it was at "similar level". The Typhoon leader acknowledged the information about the conflicting track, and passed the warning back to following elements. As the formation radar return passed the conflicting traffic the Typhoon leader also attempted to paint a picture to the rest of the formation by passing TI giving its range and bearing from Beckley Mast. He clearly considered there to be high degree of risk of collision. The radar showed clearly that the two conflicting contacts had penetrated the RA(T).

UKAB Note (3): The flypast was the subject of ACN 2009-06-0012, which notified that a RA(T) was in place for the Flypast. AUS designed the RA(T) to protect the formation(s) while minimising disruption to other users and airspace closure time. This was also notified in NOTAM J3231/09. The details of the flights and airspace closures were clear, unambiguous and amplified pictorially. The incident took place in RA(T) 'AREA G', the NOTAM stating: ***between 1200 and 1235 no ac is to fly below 2500ft unless they were in receipt of a clearance by one of several local ATC units or are on a HEMS or Coastguard task.***

UKAB Note (4): The recording of the Heathrow Radar shows the incident; however, only one of the Microlights paints continuously (squawking 7000 with Mode C). (Alts are amsl based on the London QNH of 1019mb, which was the same as the Brize QNH). Based on the Microlight pilot's report, it is assumed that this was the rear (northerly) ac and that the other Microlight (a very intermittent primary return painting only after the CPA) was slightly ahead (estimated as ½nm from occasional radar returns) at an unknown altitude but presumed generally the same as the rear ac. The recording shows the squawking Microlight tracking about 210°, 10nm to the E of Weston on the Green at an alt of 2200ft as the Typhoon formation turns left onto a track of 260° after leaving Halton; the Typhoon formation indicates level at 2100ft with the other elements in about 2nm trail. The respective ac continue to track towards the CPA, at unchanged alts. When the Microlight is in the lead (Typhoon) formation's 1 o'clock at 3nm, the Typhoons commence a slow descent to 1700ft and pass 0.7nm in front of the rear microlight, its alt remaining (at this stage) unchanged at 2100ft. The Tornado formation, 2nm behind the Typhoons, can also be seen to be descending from 2200ft to 1700ft as the Microlight then climbs to 2400ft; they pass 0.2nm (370m) in front of the (rear) Microlight and 700ft below it. The Nimrod, behind the Tornados, is also seen to descend from

2000ft to 1500ft. An extended radar recording shows the Microlight's SSR disappear at 1234:48 near Newbury where other slow moving contacts, presumed also to be light ac, are displayed down to about 1000ft amsl.

UKAB Note (5): There have been several previous AIRPROXs involving such formation flypasts (the most recent being 074/07).

MIL ACC reports that, following their handover from Luton Radar, the formation was being provided with a TS by an experienced Brize Norton controller on a quiet frequency assigned specifically for the task. The Brize Norton controller (DIR) passed the Brize QNH and the formation flew inbound iaw the NOTAMed RA(T).

The formation checked in on frequency at 1209:20, *'Brize C/S formation on handover'*: DIR replied, *'C/S formation, Brize Director, good afternoon identified Brize QNH 1019 Traffic Service, traffic right one o'clock half a mile no height, traffic 12 o'clock 3 miles crossing right to left, 2 contacts slow moving indicating similar height'*; the leader acknowledged the QNH and copied the TI before DIR updated the TI at 1209:44, *'C/S clear fly through at Brize, circuit clear, previously reported traffic now 12 o'clock 2 miles crossing you right to left, 2 contacts indicating 100ft above'*. DIR again updated the TI at 1210:05, *'Previously reported traffic 12 o'clock half a mile indicating similar height'*. The leader acknowledged at 1210:11, *'C/S affirm, it's a microlight at 2000ft'*. At 1210:40 DIR passed TI to the Red Arrows, *'C/S traffic right 2 o'clock 2 miles crossing right to left slow moving no height'*. They acknowledged at 1210:47, one of the formation elements transmitted, *'C/S, it's a paraglider, it's dead on track at 2000ft'*. The Nimrod then reported visual before transmitting at 1211.06, *'And formation C/S Nimrod further contact just on our nose half a mile'*. The formation then entered the Brize Norton CTR without further incident.

DIR met all of the conditions of a TS passing timely and accurate TI, by updating and passing further TI to the formation elements he ensured that the situational awareness of all of the pilots involved was accurate.

HQ AIR (OPS) comments that the Ikarus pilot appears to have devised a plan that was not going to guarantee that the formation avoided the RA(T). It is not easy to lead from behind, especially when your wingman has no radio! You need to be visual with and to your No 2 to ensure that you can attract his attention when required. The plan required a robust method of knowing when they were on the same timeline as the QBF (Time and Space), and it does not appear to have had one.

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.

The Board noted that there had been several similar Airprox in the recent past involving GA ac and NOTAMed military formations operating in RA(T)s and recommended that this incident be publicised widely.

It was pointed out by a GA Member that although the rear, fixed-wing microlight (the Ikarus C42) was accompanying the front (flexwing) ac to Sandown for the purposes of this investigation, they were separate units. Unfortunately since there was no report from the flexwing pilot, the Board was forced to make some assumptions based on the other information available.

It was clear that the military formation was clearly and correctly notified by NOTAM and that the RA(T) was in force at the time and position that the Airprox occurred. It was also clear from radar information that the rear microlight penetrated the RA(T) and did not climb until after it had crossed the Typhoons flightpath; that being the case, since the flexwing (although not showing on the Clee Hill recording at the time) was ahead of the Ikarus C42, the Board deduced that it too had penetrated the RA(T) and flown into conflict with at least the Typhoon element of the formation.

The TI provided by Brize DIR to the military formation was timely and accurate and enabled the leader to see the southerly of the two microlights, further disseminate the information and, when it became apparent that the ac was in conflict, to descend his element below it. After further discussion and TI, the Tornados and the Nimrod following the Typhoons, saw both microlights and also descended to ensure sufficient separation.

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Specialist Members agreed that the plan for the fixed wing pilot to 'lead' the flexwing microlight from Husbands Bosworth to Sandown had been fundamentally flawed and unworkable. Further, they agreed that both pilots were equally responsible for planning the flight and agreeing a safe and practicable method of transiting to Sandown, including avoiding the RA(T), or, if that were not possible, delaying until the formation had passed and/or the radio was repaired. In the event, there was apparently no positive means of ensuring that either microlight did not penetrate the RA(T), despite that the Ikarus C42 was well equipped. Notwithstanding that the flexwing had an unserviceable radio, and therefore the Ikarus C42 could not contact it, there was apparently no attempt by the Ikarus pilot, whose radio was functioning correctly, to contact any unit and obtain a clearance or TI. Bearing the position and alt of the formation in mind, however, it is most unlikely that a clearance through the RA(T) would have been agreed. Specialist Members also considered it astonishing that, if he saw the formation at 5nm as he reported, the Ikarus pilot continued on the same track and at the same alt (radar verified) in the belief that there was sufficient separation, until after the Typhoons had descended and the ac crossed almost a minute later. It is not clear if the flexwing pilot saw the formation or what action he took, although there are reports from two formation element leaders that he continued with no change alt or track.

GA and Military Members agreed unanimously that it is wise to avoid large military formations by a large distance and/or interval, or by at least the margin stated in any NOTAM.

Notwithstanding the unsound airmanship displayed by both Microlight pilots, the Board agreed unanimously that, the formation elements' descents had prevented any risk of collision.

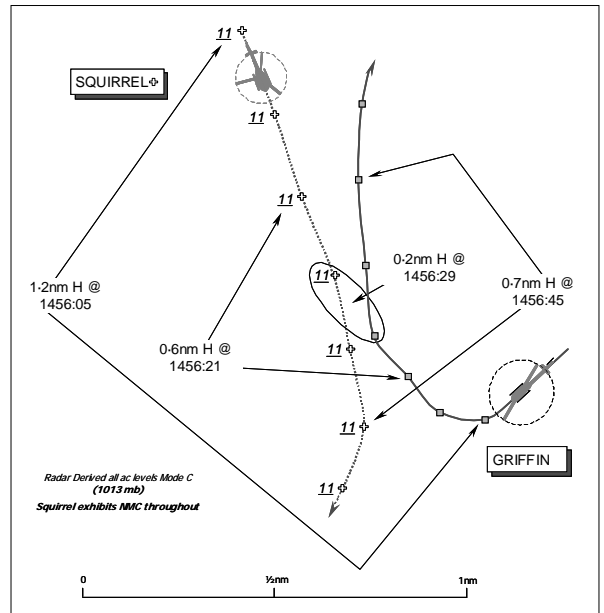
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Both microlights penetrated the RA(T) and flew into conflict with the lead elements of the military formation

Degree of Risk: C.

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Date/Time: 11 June 1456
Position: 5240N 00254W (11nm SW of Shawbury - elev 249ft)
Airspace: LFA9 (Class: G)
Reporting Ac Reported Ac
Type: Griffin HT Mk1 Squirrel HT Mk1
Operator: HQ Air (Trg) HQ Air (Trg)
Alt/FL: 500ft 1000-1500ft
 agl RPS
Weather VMC CLOC VMC CLOC
Visibility: 50km 50km
Reported Separation:
 Nil V/200m H Nil V/200m H
Recorded Separation:
 By interpolation <0.1nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE GRIFFIN HT1 HELICOPTER PILOT, a QHI, reports that he was conducting a VFR training sortie in VMC whilst listening-out on the Shawbury 'Low-level' frequency – Stud 5. Thus he was not in receipt of an ATS but a squawk of A0221 was selected with Mode C. Neither Mode S nor TCAS is fitted. [UKAB Note (1): No Mode C was evident from the Griffin helicopter during the period of the Airprox.]

At a position some 11nm SW of Shawbury heading 330° at 70kt, during the latter stages of a Practice Forced Landing (PFL) descending through 500ft agl, he saw a Squirrel helicopter in his 12 o'clock - 200m away heading directly towards them at the same height. The Yellow & Black coloured Squirrel, which had its landing light 'on', had emerged from the background of a field of Yellow Oil Seed Rape flying straight and level towards his helicopter. To avoid the Squirrel he made an avoiding action turn to the R, whilst confirming that both throttles were fully open. At the same time he saw the Squirrel turn away to starboard and pass 200m away to port at the same height, with a "high" Risk of a collision.

He reported the Airprox on the Shawbury 'Low-Level' frequency, terminated the sortie and returned to base.

THE SQUIRREL HT MK1 STUDENT PILOT reports he was flying a local VFR solo navigation exercise in the area designated "Western" in LFA 9. He was operating on the Shawbury 'Low-level' frequency - Stud 5 - not receiving any ATS and squawking A0221 with Mode C on. Neither Mode S nor TCAS is fitted.

On the first leg of his route from Nesscliffe Hill (within OS grid square SJ 3819) to a windmill N of Asterley (at OS grid SJ 373076), his track was 189°, flying at 90kt at an altitude between 1000ft and 1500ft on the Barnsley RPS. Whilst looking out for track markers he noticed a formation of 3 Squirrel helicopters turning towards his track so he adjusted his heading and altitude to maintain adequate separation. At this point the majority of his lookout and focus was on that formation. When satisfied that he was clear of the Squirrel formation, he looked back towards his original track and saw the Griffin helicopter in his 12 o'clock at a range of about 200m descending through his altitude. To avoid a collision with the Griffin, he immediately took avoiding action by breaking to the R, passing the other helicopter with minimum horizontal separation of about 200m; after rolling out of the R break he had lost sight of the Griffin. From the other helicopter's descent profile he assumed that it was probably carrying out an autorotation or a PFL. Regaining his planned track by flying to a recognisable feature at Pontesbury (OS grid SJ 400060), about 2nm to the SE of his intended turning point, he regained his NAVEX route and headed back to Shawbury.

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He assessed the Risk as “high” and stressed that his lookout scan had been distracted by the Squirrel formation. His helicopter has a Yellow & Black colour scheme and the upper and lower HISLs were ‘on’.

THE GRIFFIN & SQUIRREL PILOTS’ UNIT commented that this Airprox resulted from a solo student on a NAVEX being forced out of position both laterally and probably vertically whilst concerned about another formation and so did not see until quite late a Griffin completing a PFL. The lookout from the Griffin helicopter is constrained below the ac and the Squirrel’s colour scheme may not have helped here. Class G airspace works on the ‘see and avoid’ principle so it is incumbent on all to maintain a diligent lookout and to always ‘expect the unexpected’.

MIL ACC reports that the Griffin helicopter pilot reported an Airprox on frequency 376.75MHz - Shawbury Stud 4 - at 1458:15. The Griffin pilot reported, “*Shawbury Low Level [Griffin C/S]..Airprox in PFL Box 2 time 1558 local..approximately 500 feet..was with a Squirrel aircraft from Shawbury*”. The controller made a blind transmission and requested any Squirrel helicopters on frequency to check in, whereupon 3 flights called and the subject Squirrel helicopter pilot confirmed that he had been flying in the vicinity.

The controller provided a BASIC Service iaw CAP774 Chap 2 Para 1.

A Basic Service is an ATS provided for the purpose of giving advice and information useful for the safe and efficient conduct of flights. This may include weather information, changes of serviceability of facilities, conditions at aerodromes, general airspace activity information, and any other information likely to affect safety. The avoidance of other traffic is solely the pilot’s responsibility. Basic Service relies on the pilot avoiding other traffic, unaided by controllers/FISOs. It is essential that a pilot receiving this service remains alert to the fact that, unlike a Traffic Service and a Deconfliction Service, the provider of a Basic Service is not required to monitor the flight.

Apart from acknowledging the immediate Airprox report and trying to establish the identity of the Squirrel helicopter the controller’s actions had no bearing on the incident.

HQ AIR (TRG) comments that LFA 9 has a high concentration of rotary training aircraft conducting a wide variety of flight profiles and exercises. Just prior to this Airprox the Squirrel pilot, a solo student, had been focusing his attention on a formation of helicopters that he had been taken avoiding action on consequently he saw the Griffin late. The Griffin crew were busy conducting a PFL exercise and only spotted the Squirrel as it emerged from a background of yellow that effectively defeated the yellow and black hi-visibility colour scheme of the Squirrel. Although both crews saw each other late they did have sufficient time to take effective avoiding action reducing the risk of an actual collision.

[UKAB Note (2): The Clee Hill Radar recording shows the Griffin, with NMC evident, turning R onto a NW’ly track at 1456:05 as the Squirrel approaches on a broadly SSE’ly course 1.2nm away. The Squirrel maintains 1100ft Mode C (1013mb) - an altitude of about 1070ft RPS (1012mb) – as the two ac close to a range of 0.2nm at 1456:29. The reported avoiding action turns effected by both pilots are portrayed as both helicopters turn slightly R and pass abeam each other ‘port-to-port’ with the CPA occurring in between sweeps. The parallel track displacement is shown by interpolation to be <0.1nm. Both ac then clear respectively N & S of the Airprox location, some 11nm SW of Shawbury.

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.

With both helicopters approaching on broadly reciprocal courses, or nearly so, in the ‘see and avoid’ environment of the LFA, each pilot had an equal responsibility to sight each other’s ac and give way as necessary. It was evident to the Board that once they turned their helicopter to the NW, the Griffin crew would have had difficulty in seeing the Squirrel helicopter approaching from the N and initially below them. The constrained field-of-view forward and down from the Griffin’s cockpit had been highlighted by the pilots’ Unit. Members agreed that it would have been difficult for either the Griffin QHI or his student to spot the Squirrel – approaching from broadly ahead – given the helicopter’s nose-up attitude as they descended during the PFL. Clearly the student would have much of his attention focussed on handling the ac and the QHI would be monitoring his performance closely. It was also reported that the Yellow & Black Squirrel had blended into the background landscape, thereby impeding early visual detection. The Board was briefed that this was entirely feasible given the nature of the terrain where the

Airprox occurred, which is a 'patchwork quilt' of farmland. It appeared that the small head-on aspect of the approaching Squirrel helicopter, coupled with little relative movement and the lack of conspicuity defeated the Griffin crew's lookout scan, resulting in a late sighting at a reported range of 200m. Significantly, the Griffin QHI had mentioned that the Squirrel's landing lamp was on, and that might perhaps have been the trigger which drew his attention to the other helicopter at the critical moment. Pilot Members recognised the importance of making their ac as conspicuous as possible and perhaps here was ample justification for the use of all available lighting when airborne all of the time. Indeed the Board was aware from previous Airprox reports of the significance of the Hawk nose light in making this jet ac of even smaller cross-sectional area more obvious to other pilots. Even so, the Members agreed unanimously that this was too close in these circumstances and concluded that a late sighting by the Griffin crew was part of the Cause.

A helicopter formation had evidently distracted the solo student pilot in the Squirrel earlier and, with no other crew member to assist his lookout, the solo student was also impeded by the relative geometry of this encounter. He also reported sighting the Griffin at a range of 200m, hence this was also a late sighting on his part and the other half of the Cause.

Both the QHI and the solo student elected to turn R, in conformity with the Rules of the Air, achieving a minimum of 200m horizontal separation. The separation reported by both pilots is substantiated by the radar recording which gives a track displacement of <0.1nm as both ac passed abeam one another, in between radar sweeps. Whilst it was evident to the Members that the avoiding action taken by both pilots removed any actual risk of a collision, the late sighting distances and the limited separation ultimately achieved did not assure safety in the circumstances conscientiously reported here.

PART C: ASSESSMENT OF CAUSE AND RISK

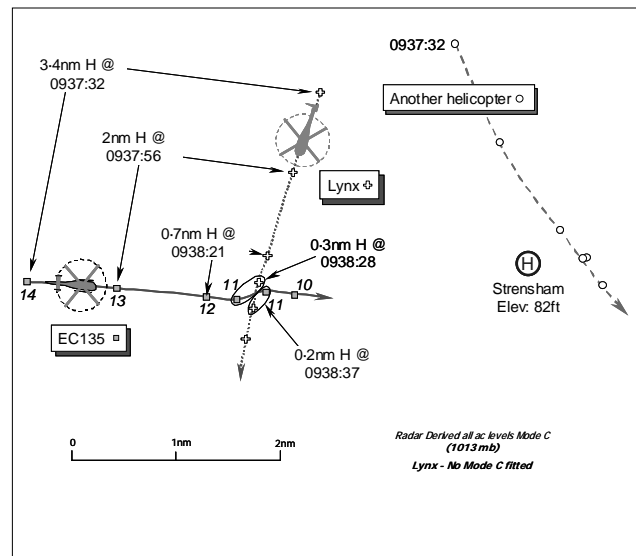
Cause: Late sightings by both the Griffin crew and the Squirrel pilot.

Degree of Risk: B.

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AIRPROX REPORT NO 2009-050

Date/Time: 15 June 0938
Position: 5203N 00214W (2nm W of Strensham)
Airspace: London FIR (Class: G)
Reporting Ac Reporting Ac
Type: EC 135 T2 Lynx Mk3
Operator: Civ Comm HQ FLEET
Alt/FL: 1100ft 1000ft
RPS (1013mb) QNH (1017mb)
Weather VMC VMC
Visibility: >40km >10km
Reported Separation:
50ft V/50m H 20ft V/75m H
Recorded Separation:
Tracks crossed



BOTH PILOTS FILED

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE EC135 T2 PILOT reports that he was in transit under VFR, flying single pilot with a crew of 2, from Hereford Hospital to Strensham at 2000ft on the Cotswold RPS (1013mb) [UKAB Note (1): Met Office archive data gives the COTSWOLD RPS for the period 0900-1000UTC as 1012mb]. 'Listening out' with Gloucestershire ATC on 128-55MHz, he was not in receipt of any ATS and a squawk of A0020 was selected with Mode C on. Neither TCAS nor any other form of CWS is fitted.

Flying in VMC some 1500ft clear below cloud at 130kt, he first became aware of another military Helicopter from its RT callsign – not the subject Lynx - flying S from the Worcester area and first spotted it while crossing the Malvern Hills. He began his descent for Strensham immediately after crossing the Malvern Hills and a few minutes later spotted the Lynx ac in his 10 o'clock position flying L – R, some 2nm away at this point. He was initially reluctant to turn L to avoid the Lynx, as he believed that its pilot would 'give way' by turning to the R. However, it quickly became apparent that they could not have seen his EC135 and so avoiding action was taken by turning L and there was "a loss of separation" he believed. Minimum horizontal separation was 50m as the Lynx passed 50ft below his helicopter and he assessed the Risk as "medium". His flight was then continued without further incident and he landed at Strensham. His helicopter is coloured red & yellow: the white HISL and two landing lights were selected 'on'.

THE WESTLAND LYNX MK3 PILOT-IN-COMMAND provided a very comprehensive account reporting that at the time of Airprox his helicopter was crewed by 2 pilots: as ac commander he was navigating the ac during the return NAVEX from Cosford to Yeovilton. They were operating VFR in VMC whilst in transit at 120kt. Maintaining a level cruise at an altitude of 1000ft QNH (1017mb) [UKAB Note (2): Met Office archive data gives the Gloucestershire A/D QNH as 1016mb for this time] with an in-flight visibility of >10km, under a cloudbase of about 3000ft amsl and 'nil' weather, they were in receipt of a BASIC Service from Gloucestershire ATC on 128-55MHz. A squawk of A7000 was selected: neither Mode C, S, TCAS nor any other form of CWS is fitted.

Overhead Upton-upon-Severn heading 197°, the PF "swerved" to avoid another helicopter – a Red & Yellow EC135 Air Ambulance - which appeared in their 1-2 o'clock position 200m away heading towards their helicopter. Initial detection was visual acquisition by the PF in the RHS who immediately took avoiding action by making a steep turn to the L, applying 30-40° angle of bank, whilst also descending. He, as ac commander seated in the LHS, did not see the EC135 until the PF warned him, at which point the other helicopter was seen to pass down the right hand side of the Lynx and draw astern. Minimum separation was estimated at 75m horizontally and 20ft vertically and both he and the PF assessed that there was a "very high" probability of a Risk of a collision with the EC135 if avoiding action not been taken.

Gloucestershire ATC was contacted on RT to ask if an Air Ambulance flight was in two-way RT contact with them, but the controller informed them that this was not so. However, on attempting to raise the Air Ambulance on RT, it became apparent that the pilot was maintaining a 'listening watch' on the frequency in question.

On the topic of the BASIC Service, he commented that at the debrief, the crew noted that the level of traffic information provided regarding the position of other ac varied depending on the ATSU providing the service. Three days previously, on the outbound transit, it was noted that some ATSUs were giving "positional traffic information" under a BASIC Service. At the time of the Airprox, no traffic information had been received. He opined that both of these cases are completely within the bounds of the regulations regarding a BASIC Service.

He pointed out that it was highly likely that the EC135 closed on a constant bearing. Additionally, he stressed that Lynx helicopters have substantial framework surrounding the windscreen positioned in the PF's 1-2 o'clock. It was also observed that there were many insects on the windscreen. Both he and the PF believed that a combination of these issues may have contributed to the Airprox.

UKAB Note (3): The Clee Hill Radar recording shows both the eastbound EC135 helicopter - squawking A0020 - and the southbound Lynx - squawking A7000 - as secondary contacts only at 0937:32, without any supporting primary radar data, converging on a point some 2nm W of Strensham HLS. The EC135 is shown in a gradual descent from 1400ft unverified Mode C (1013mb) on a track of about 100° with the Lynx some 3-4nm NE (no Mode C fitted [NMC]) maintaining a course of about 200° whilst maintaining a steady relative bearing to one another as the helicopters close. Another ac is evident further to the NE of the Lynx - squawking A7000 - which might well be the other helicopter mentioned in the EC135 pilot's account. The subject helicopters are shown 2nm apart - the range the EC135 pilot reported acquiring the Lynx for the first time - at 0937:56. Thereafter, both the EC135 and Lynx maintain a steady course down to a range of 0.3nm at 0938:28, the former indicating 1100ft Mode C (1013mb). The CPA occurred in between radar sweeps, as the EC135 turns L in conformity with the pilot's reported avoiding action and passes astern of the Lynx. The Lynx pilot's reported avoiding action "swerve" is not evident at this scale neither is the EC135 pilots descent evident: on the next sweep timed at 0938:37, the two helicopters are shown 0.2nm apart the EC135 still indicating 1100ft Mode C (1013mb) – this would equate broadly to an altitude of about 1220ft QNH, above the Lynx pilot's reported transit altitude of 1000ft (1017mb) before the tracks crossed.

The absence of primary radar data to support the SSR positional information must be borne in mind here beneath the lower limit of the Clee Hill Radar's primary coverage, nevertheless, it is evident that the tracks crossed at close quarters.

UKAB Note (4): The Military LFH at Part 1-2-4-5 promulgates within the LFA4 Section brief for military aircrews, Strensham HLS (HA03) as a warning only. Therefore, no specific mandatory avoidance criteria are specified.

ATSI comments that the GLOSTER APS/APP was providing the Lynx crew with a BASIC Service without the use of ATS surveillance radar the provision of this Service. The controller was not aware of the presence of the EC135 as its pilot had not communicated his intentions to GLOSTER. Consequently, there are no implications for civil ATC in this Airprox.

HQ NAVY COMMAND comments that the EC135 was approaching the Lynx on a constant bearing, in an area of the windscreen offering poor lookout, this markedly reduced the chance of the Lynx crew acquiring visual contact with the EC135 on their normal scan.

Navy Command considers the EC135 crew, having sighted the Lynx 30 seconds earlier and notwithstanding the fact that they had right of way, should have taken earlier action to prevent this from being a reported incident.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It was evident to the Board that, in this non-radar procedural environment, GLOSTER APP could do nothing to forestall this close-quarters encounter. As the EC135 was only listening out on the frequency and had not informed APP of his presence and intentions, the Lynx crew had no way of knowing that the EC135 was in the area until

AIRPROX REPORT No 2009-050

they saw it. If the EC135 pilot had informed APP what he was doing and had been heard by the Lynx crew operating on the same frequency, this might have alerted the latter to the presence of the helicopter inbound to Strensham, which they could then have taken into account.

In the event, this encounter between two VFR flights, which occurred in Class G airspace, relied on the principle of 'see and avoid' as the only method of detecting and ensuring separation against other observed traffic. It was plain that under the 'Rules of the Air' in this situation, the Lynx crew were required to see and 'give way' to the EC135 approaching from their right - broadly at their altitude. However, 'the Rules' can only work if the other ac is spotted in time to take appropriate action to remain clear. It was evident from the Lynx Commander's report that the PF had not detected the presence of the EC135 helicopter until it was a mere 200m away. He stated that his Lynx has a substantial framework surrounding the windscreen, positioned in the PF's 1-2 o'clock - the relative bearing from which the EC135 was approaching; notwithstanding the obscuration caused by the airframe, pilot Members were adamant that the PF should still have taken care to ensure that blind spots were regularly checked for any conflicting traffic. Military Members advised that military pilots are trained to take such factors into account in their overall lookout regime and it should have been feasible for the PF to move his ac so as to clear blind arcs from time-to-time - especially out to starboard where he had a duty to 'give way' to any ac approaching from that sector. This was a salutary lesson in airmanship from this Airprox. Members were cognisant of the difficulties of maintaining a disciplined lookout scan, but it was evident from the radar recording that the EC135 was indeed there to be seen and should have been spotted early enough to give it a wide berth. Unmistakably, under the 'Rules' the EC135 had 'right-of-way' in this crossing situation and Members concluded that the fundamental Cause of this Airprox was the late sighting by the Lynx crew.

It was also apparent from the EC135 pilot's comprehensive account that, despite being distracted by another military helicopter further to the NE, he had seen the Lynx about 2nm away. When, having allowed some time for the Lynx crew to see him and give way, the Lynx did not deviate from its course, the EC135 pilot should have considered the possibility that the Lynx crew had not seen his helicopter. Given this situation, the Board considered that it would have been preferable and good airmanship for the EC135 pilot to have made a slight alteration at range to pass well clear of the Lynx - horizontally and/or vertically - rather than 'stand-on' and maintain his course and speed into a close quarters situation. Notwithstanding the 'Rules' giving precedence to the EC135, the clear lesson here is that, if the other pilot appears to be unaware of the presence of your ac, then it is far preferable to give the other ac a wider berth yourself before it gets too close. Whilst some Members considered this to be central to the Cause, that the EC135 pilot elected to fly his helicopter into close proximity with the Lynx, which he avoided at a late stage, was considered to be a Contributory Factor to the Airprox.

Lengthy debate ensued about the inherent Risk. The undoubted late sighting by the Lynx crew at a range of 200m and their robust avoiding action had only achieved minimum separation of 75m and 20ft vertically from their perspective. Furthermore, the EC135 pilot had to make strenuous efforts to avoid the Lynx which, in his view, had only achieved 50m horizontal separation and 50ft vertically; the vertical separation was possibly assisted by the Lynx pilot's descent. In the view of some members this had not ensured safety. It was not possible to measure the actual minimum separation as the CPA occurred between radar sweeps and because this Lynx Mk3 helicopter is not fitted with Mode C. Some Members considered that by pressing on in from a range of 2nm to such close quarters the EC135 pilot had heightened the Risk and that, had the Lynx crew reacted differently, there was a serious risk of a collision. Others took the view that, since the EC135 pilot had had the Lynx in sight from 2nm and was primed to react instantly to any manoeuvre by the Lynx crew, there was little risk of a collision. Conscious that the Board could only base its assessment on what actually happened and not what might have occurred if the situation had been slightly different, the Board decided by the narrowest of margins that no actual risk of a collision had existed in the circumstances reported here.

PART C: ASSESSMENT OF CAUSE AND RISK

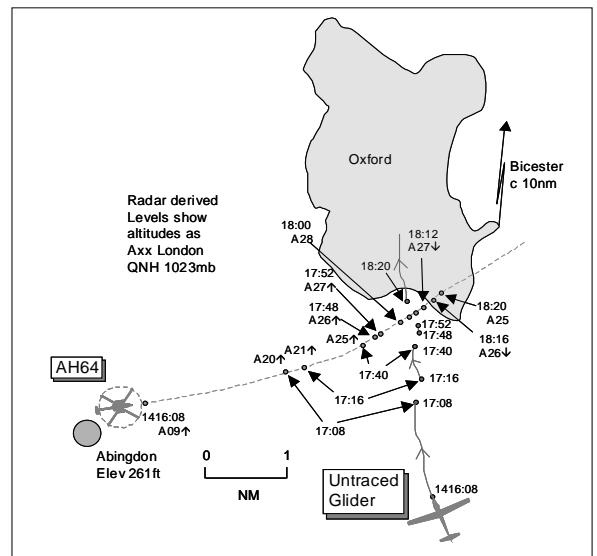
Cause: Late sighting by the Lynx crew.

Degree of Risk: C.

Contributory Factors: The EC135 pilot elected to fly into close proximity with the Lynx, which he avoided at a late stage.

AIRPROX REPORT NO 2009-051

Date/Time: 16 Jun 1418
Position: 5143N 00112W (5nm NE Abingdon)
Airspace: Oxford AIAA (Class: G)
Reporting Ac Reported Ac
Type: AH64 Apache Untraced Glider
Operator: HQ JHC NK
Alt/FL: 2380ft↑
(RPS 1019mb)
Weather VMC CLBC NK
Visibility: 30km
Reported Separation:
50ft V NR
Recorded Separation:
<0.1nm

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

THE AH64 APACHE PILOT reports outbound from Abingdon VFR and in receipt of BS from Brize Norton, squawking with Mode C. The visibility was 30km flying 2000ft below cloud in VMC and the helicopter was coloured dark green with nav lights and HISLs switched on. Heading 080° at 120kt climbing through 2380ft RPS 1019mb, he saw a glider, coloured white with a red stripe, pass directly O/H at a range of 50ft crossing from R to L. The HP initiated a rapid descent to avoid whilst the glider continued on its original course 360°, its pilot apparently having not seen his helicopter. He assessed the risk as high.

RAC MIL reports that the identity of the reported glider remains unknown. Three intermittent primary only contacts, believed to be gliders, are seen transiting through the area; however, the returns could not be tracked from a point of origin or to a destination. Procedural tracing action also proved inconclusive. Although Bicester Gliding site was active with up to 40 gliders airborne, none of the pilots operating locally reported seeing or being involved with an AH64 Apache in an incident.

THE BRIZE ZONE CONTROLLER reports in position for about 1hr 20min with a light traffic situation and conditions were good VFR. He was bandboxing the APP, DIR and ZONE frequencies. The AH64 became airborne from Abingdon and its pilot called on the Zone frequency for a BS climbing to 3000ft on the Cotswold RPS 1019mb. The flight was given a squawk and placed under a BS. Whilst routeing to the Beckley mast the pilot reported an Airprox with a glider. There were a few intermittent contacts on radar without SSR and as the AH64 was under a BS he did not call the traffic.

MIL ACC reports that at 1416:02, shortly after departing Abingdon on a VFR flight returning to Wattisham, the AH64 Apache helicopter called Brize Norton Zone on frequency 119.0MHz requesting a BS. The Apache pilot transmitted, 'Brize Zone good afternoon AH64 c/s Basic Service'. The controller replied, 'AH64 c/s Brize Zone good afternoon Basic Service squawk 3701 what altitude are you climbing to'. The Apache pilot replied at 1416:24, '3701 the squawk and AH64 c/s will be climbing for 3000 feet'. Several admin calls were made in which the Apache pilot confirmed his destination as Wattisham, was told to avoid the Benson ATZ but cleared to transit the MATZ, which he acknowledged, as well as reading back the Cotswold RPS (1019mb). At 1418:51 the Apache pilot transmitted, 'AH64 c/s should probably report just had an Airprox with a glider I probably missed it by about 50ft'. Brize Zone responded, 'Roger that's copied about 50ft you say'. The Apache pilot replied, 'AH64 c/s affirm climbing to 3000 feet and it was just above us so we managed to miss it and continuing the climb now to 3000 feet'. At 1419:13 Brize Zone acknowledged, 'Roger that's copied you are under a Basic Service'. The Apache pilot replied, 'AH64 c/s roger Basic Service um just South of Oxford there's about 3 gliders or 4 there just operating at the moment'. The Brize Zone controller confirmed that the Apache pilot would be filing paperwork at 1421:01 to which the pilot replied, 'AH64 c/s will be putting it in just trying to ascertain where in the local area there is er a gliding launch site,

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there were 3 aircraft the top one appeared to be about 3500 feet er and we missed it by 50 feet passing beneath it so we stopped the climb to prevent us climbing into them'.

The controller provided a Basic Service iaw CAP774 Chap 2 Para 1.a. *A Basic Service is an ATS provided for the purpose of giving advice and information useful for the safe and efficient conduct of flights. This may include weather information, changes of serviceability of facilities, conditions at aerodromes, general airspace activity information, and any other information likely to affect safety. The avoidance of other traffic is solely the pilot's responsibility. Basic Service relies on the pilot avoiding other traffic, unaided by controllers/FISOs. It is essential that a pilot receiving this service remains alert to the fact that, unlike a Traffic Service and a Deconfliction Service, the provider of a Basic Service is not required to monitor the flight.*

HQ JHC comments that the AH64 crew were in receipt of a Basic Service from Brize Zone and the crew were therefore responsible for traffic avoidance. Gliders are notoriously difficult to spot even in good visibility, and this area has an extremely high level of this type of traffic. This incident serves as a reminder to all crews operating under a Basic Service that lookout is vital, particularly in areas of high intensity gliding activity.

UKAB Note (1): Analysis of the Heathrow 23 and 10cm, Clee Hill and Debden radar recordings revealed 3 gliders tracking N'ly through the Oxford area but 2 have been omitted from the diagram for clarity. One of these gliders was approximately 3-5nm ahead of the glider involved whilst the other was 1.5nm NE of it; both of these leading gliders were to the N of the AH64's track when the Airprox occurred. The AH64 is first seen at 1416:08, 0.8nm ENE of Abingdon tracking 080° squawking 7000 unverified Mode C showing unverified altitude 800ft London QNH 1023mb (680ft Cotswold RPS 1019mb). At this time the untraced glider is in the AH64's 0130 position, range 3-75nm tracking N. Shortly after this the AH64's Mode A changes to the assigned Brize code of 3701 as the helicopter climbs through 1200ft QNH. The 2 ac continue on roughly steady tracks, the untraced glider fading intermittently and exhibiting track jitter, before the AH64 turns onto a more NE'ly track approaching the S outskirts of Oxford whilst climbing through altitude 2500ft QNH; at this stage the untraced glider in its 1 o'clock range 0-6nm. Although the AH64 pilot reports the incident occurred whilst climbing through 2380ft RPS (2500ft QNH) the AH64 continues climbing, passing 2700ft QNH at 1417:52 with the glider in its 1230 position range 0-5nm crossing R to L. The glider disappears from radar whilst the AH64 is seen levelling-off 8sec later at 1418:00 at 2800ft QNH for 2 further radar sweeps (8sec) before descending at 1418:12; this is believed to be the avoiding action reported by its pilot. The AH64 then levels at 2500ft QNH at 1418:20 as the glider reappears on radar in its 7 o'clock range 0-4nm. Consequently the CPA was not captured but taking ac tracks and speeds into account, both prior to and post Airprox, it is estimated the ac passed <0.1nm of each other during the encounter. Thereafter the untraced glider return completely fades from radar when just to the N of Oxford with its identity unknown.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilot of the AH64, transcripts of the relevant RT frequencies, radar video recordings, reports from the air traffic controllers involved and reports from the appropriate ATC authorities.

Concentrating on the controlling aspects first, Members were disappointed that the Brize Zone controller, having seen the intermittent radar contacts from gliders in the area ahead of the AH64, had not passed the glider activity information to its pilot. Although aware that passing specific TI to pilots whilst in receipt of a BS can lead to confusion as to type of service being provided, Members agreed that good 'controllership' (i.e. best practice) in this case required the controller to pass generic information about the intermittent activity he could see ahead of the AH64.

The AH64 pilot was apparently surprised to encounter the gliders and had tried to establish whether they were operating from an adjacent gliding site. A GA Member informed the Board that the Oxford area was usually busy with gliders and that pilots should expect to encounter them anywhere outside CAS as they could be locally-based aircraft or transiting the area whilst on a cross-country from a distant gliding site. Within Class G airspace, pilots are responsible for maintaining their own separation from other traffic through 'see and avoid'. The AH64 was in a steady climb enroute and the crew had only seen the glider late, and this was a part cause. The radar recording revealed that the glider had been in the AH64 crew's field of view for some considerable time prior to the Airprox, although it would have undoubtedly been difficult to see against a background of cloud. Equally, the camouflaged AH64 would have been difficult for the glider pilot to see against the background of countryside as it approached from below. Without the benefit of a report from the untraced glider pilot, it was unclear whether the glider pilot had seen the helicopter, although the AH64 pilot reported the glider continued on a steady course with no apparent

avoiding manoeuvre. One Member opined that if the glider pilot had seen the helicopter with the reported 50ft separation, he would have filed. Another hypothesis put forward was that the separation distance had been greater than that estimated by the AH64 pilot and consequently the glider pilot did not feel at risk. However, Members agreed that there was no reason to doubt the AH64 pilot's account and that, on the balance of probability, the glider pilot had not seen the helicopter as it approached, initially from his L, and, immediately prior to the CPA, from his rear L quarter; this probable non-sighting was also a part cause of the Airprox.

Looking at risk, the AH64 crew saw the glider and took immediate action by arresting their climb and commencing an immediate descent, estimating the glider passed 50ft above. These actions taken, albeit late, were enough to persuade the Board that the actual risk of collision had been removed but the ac passed in such close proximity such that safety had not been assured during the encounter.

PART C: ASSESSMENT OF CAUSE AND RISK

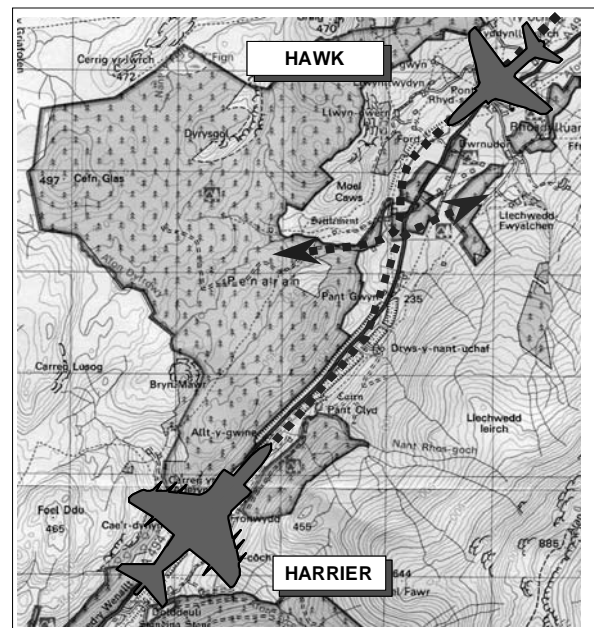
Cause: Probable non-sighting by the glider pilot and a late sighting by the AH64 crew.

Degree of Risk: B.

AIRPROX REPORT No 2009-052

AIRPROX REPORT NO 2009-052

Date/Time: 16 June 1540
Position: 5248N 00344W(4.5nm SW of S end of Lake Bala)
Airspace: UKDLFS (Class: G)
Reporting Ac Reported Ac
Type: Hawk T1 Harrier GR9
Operator: HQ Air (Trg) HQ Air (Ops)
Alt/FL: 250ft agl 400ft
(RPS 1017mb) (N/K)
Weather VMC CLBC VMC
Visibility: 10km untd
Reported Separation:
0ft V/10m H NR
Recorded Separation:
NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE HAWK T1 PILOT reports flying as No2 in a pair of non TCAS equipped ac on a low level training sortie in LFA 7, squawking 7001 with Mode C and operating on a tactical frequency. The formation entered the Bala valley heading SW into sun at 420kt. At the time, the No2 was the lead ac and the formation was flying in 'fighting wing'. While the rear seat pilot (the captain and QFI) had control, he saw an ac about 500m away bloom rapidly in the gunsight directly in front of them and heading towards their ac so he initiated a hard pull up to the right to avoid the other ac and cleared the flight path ahead. He identified the ac as a grey Harrier and made an RT call to warn his wingman but it was now well clear and heading away. He estimated that the other ac passed them by just over 2 Hawk wingspans and assessed the risk as very high and reported the incident immediately on landing.

THE HARRIER GR9 PILOT provided a very brief report stating that while flying solo as a singleton in a non TCAS equipped ac but with the HISL switched on, he was tracking NE at 400ft agl (radalt) and flying at 420kt in the centre of a narrow valley. He had just rolled out of a left hand turn when he saw the nose light of a Hawk ac about 1nm away so he immediately initiated a right hand climbing 'break' and saw the Hawk doing the same. He could not assess the separation but considered the collision risk to be high.

UKAB Note (1): The incident took place below the base of recorded radar cover.

UKAB Note (2): Both ac were in the valley to the SW of Lake Bala. At the point where the incident took place the valley is about 1200ft deep, narrow and has several bends. It is considered likely therefore that the maximum distance available for the pilots to see the opposing ac would have been about 1nm. The ac were closing at about 840kt (14nm/min). That being the case the pilots would have had a little over 4 sec to see the other ac and react.

UKAB Note (3): At the time of the incident there were 7 other ac booked into LFA7.

UKAB Note (4): The Valley METAR for 1450 was:

EGOV 161550Z 20015KT 9999 FEW025 SCT250 17/12 Q1022 BLU NOSIG=

HQ AIR (OPS) comments that once again the Hawk nose-light proved its worth and allowed the Harrier pilot to take avoiding action.

HQ AIR (TRG) comments that the pilots involved in this high speed encounter could not have seen each other sooner. Both crews took appropriate avoiding action in the few seconds they had prior to the closest point of approach thereby reducing the risk of collision.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from the pilots of both ac and reports from the appropriate operating authorities.

The Board noted that both ac were operating legitimately in LFA 7. Due to the terrain in the immediate vicinity of the incident, neither pilot would have been in a position to see the opposing ac much earlier than they did. Military pilot Members considered that both pilots did well to see and avoid the opposing ac in the very limited time available. The Board therefore concluded that this incident was a conflict in the UKDLFS resolved by both pilots. Whilst late but effective avoidance had been taken, Members agreed that safety had nevertheless been compromised.

PART C: ASSESSMENT OF CAUSE AND RISK

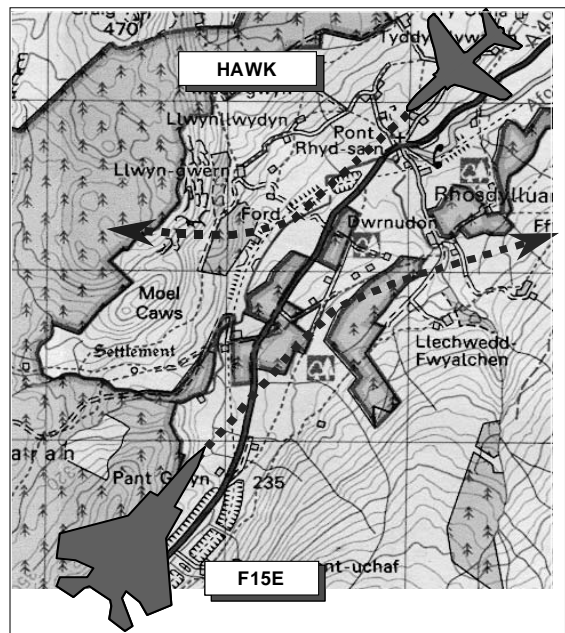
Cause: A conflict in the UKDLFS resolved by both pilots.

Degree of Risk: B.

AIRPROX REPORT No 2009-053

AIRPROX REPORT NO 2009-053

Date/Time: 16 Jun 1205
Position: 5249N 00342W (3.5nm SW of SW End of Lake Bala)
Airspace: UKDLFS (Class: G)
Reporting Ac Reported Ac
Type: Hawk T1 F15E
Operator: HQ Air (Trg) HQ 3AF
Alt/FL: 250ft AGL 500ft AGL
(RPS 1018mb) (QNH)
Weather VMC CAVOK VMC CAVOK
Visibility: >10km Unltd
Reported Separation:
1000ft V /20ft H 500ft V/ 0.75nm H
Recorded Separation:
NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE HAWK T1 PILOT reports flying as leader (at the time) in a tactical low level training sortie in a black ac with HISLs and nose light switched on squawking 7001 with Mode C but not in receipt of an ATS from any unit. At 1205z the formation entered Bala Valley in fighting wing formation heading SW, into Sun but in good visibility, at 420kt and the ac was being flown by the front seat pilot (QFI) when a grey F15 ac was seen 3nm away but approaching rapidly and heading directly towards them. A hard avoiding pull up to the right was initiated and the flight path cleared while simultaneously making an RT call to his wingman, who pulled up vertically. The F15 passed underneath with no avoiding action apparently being taken. He reported the incident on landing, assessing the risk as being high.

THE F15 PILOT reports flying as a singleton on a tactical low level training sortie in a dark grey ac with HISLs and nav lights switched on squawking 7001 with Mode C and Mode S selected but not in receipt of an ATS from any unit. At 1205Z they were just about to start a simulated attack run, heading 060° (out of Sun) at 500kt and flying at 500ft agl (radalt), from the Southern part of Bala Lake. Just prior to their action point, heading 060°, they spotted a formation of Hawks 1nm away, off to the left side of their ac in the 10-11 o'clock position, so they initiated a 10-15° check turn to the right to avoid the Hawks and passed within 0.75nm (4500ft) horizontally and 500ft vertically. They then flew along the remainder of Bala Lake on a NE heading with no further incident and assessed the risk as being medium.

UKAB Note (1): Although both ac show intermittently, the incident took place below the base of recorded radar cover.

UKAB Note (2): Both ac were operating legitimately in LFA7 and there were 4 others booked into the area at the time of the incident.

HQ AIR (TRG) comments that the crews of both ac saw each other with sufficient time to take effective avoiding action.

HQ 3 AF comments that this appears to be a routine encounter in the UKDLFS; the F15E crew were heads up at the time and saw the Hawk pair in sufficient time to take adequate avoiding action.

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 respective operating authorities.

The Board noted that both ac were operating legitimately in LFA7 under the 'see and avoid' principle and that both pilots had seen the opposing ac in good time to take effective avoiding action, both laterally and vertically. In this conflict in the UKDLFS, the prompt action taken by both pilots ensured that safety had not been compromised.

PART C: ASSESSMENT OF CAUSE AND RISK

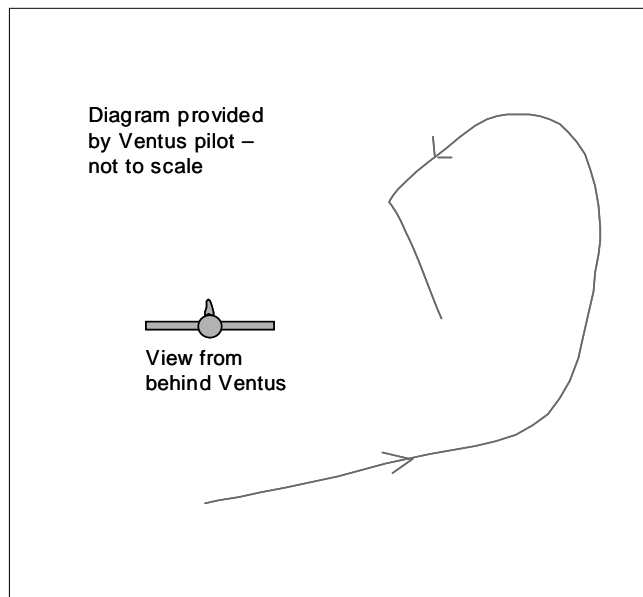
Cause: A conflict in the UKDLFS resolved by both pilots.

Degree of Risk: C.

AIRPROX REPORT No 2009-054

AIRPROX REPORT NO 2009-054

Date/Time: 14 Jun 1242 (Sunday)
Position: 5141N 00113W (4nm NE Didcot)
Airspace: Oxford AIAA (Class: G)
Reporting Ac Reported Ac
Type: Ventus Glider Untraced
Light Ac
Operator: Civ Club NK
Alt/FL: 3700ft NK
(QNH)
Weather: VMC CLBC NK
Visibility: 50km
Reported Separation:
Nil V/150m H
Recorded Separation:
NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE VENTUS GLIDER PILOT reports flying solo on a local sortie from Bicester, VFR and in communication with other gliders on the Common frequency 130.125MHz; no transponder was fitted. The visibility was 50km whilst flying 1000ft below cloud in VMC and the ac was coloured white. About 6km NE of Didcot power station heading S at 100kt and cruising at 3700ft QNH a powered ac pulled up into what turned out to be a half Cuban manoeuvre. It was 400m ahead and to his R pulling to the vertical when he first saw it. As the ac came over the top, his glider's projected flight path placed him exactly where the other ac was pointing as it began to establish an inverted 45° line towards him from R to L in his 2 o'clock. The other pilot obviously saw his glider at this point and rolled R and pulled downwards passing 150m clear to his R. He believed that had the other pilot not seen his glider he would have had just enough time to avoid a collision, assessing the risk as medium. He was unfamiliar with the other ac type but another glider pilot, flying about 50m behind and to his L, was positive it was a Grob Tutor.

RAC MIL reports that despite extensive tracing action the identity of the reported ac remains unknown. The reporting glider does not show at all on the recorded radars. Initial analysis of the Heathrow 23 and 10cm, Clee Hill and Pease Pottage radars around the reported time of the Airprox (1342BST or 1242UTC) revealed a Grob Tutor departing Benson to the NW and transiting through the reported Airprox location; however, the ac is in steady climb and turns to the W, eventually manoeuvring above 5000ft about 10nm WSW of the reported location some 10min later. When asked to confirm the location, altitude and time of the incident, the Ventus pilot was confident that the location and altitude were accurate; his only doubt was to the precise time. Further radar analysis was carried out using time windows 1142, 1242 and 1342 ±20min, 10nm radius of the reported location. No Grob Tutors, or any other primary or secondary radar contacts, are seen to carry out aerobatic manoeuvres at the reported location during any of the time windows.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilot of the Ventus glider and radar video recordings.

Members were aware that this had been a busy summer weekend. It was disappointing that the identity of the reported ac could not be established; since there were no primary or secondary radar returns in the reported position of the Airprox, and because Tutor ac are routinely visible through their squawks and skin returns, the Board believed that the other ac was almost certainly not a Tutor. The Ventus pilot saw the other ac as it pulled up from below into the vertical element of an aerobatic manoeuvre and Members believed that the Ventus pilot had seen the other ac at the earliest possible opportunity. However, without the benefit of a report from the pilot

of the other ac, Members could not be sure whether or not the other pilot had seen the glider. Given this uncertainty, the Members had little option but to classify this encounter as a conflict in Class G airspace.

Although it appeared that the other pilot had manoeuvred to avoid the Ventus, an experienced GA pilot Member opined that, in the worst case, the other ac may have 'fallen out' of an aerobatic sequence and that the 'avoiding action' manoeuvre seen may have been fortuitous. The Ventus pilot had reported that had the other ac not manoeuvred, he would have had enough time to effect his own avoiding action; however, the ac passed with an estimated 150m separation. This was enough to allow the Board to conclude that the risk of collision had been removed but the ac passed with separation margins reduced and with safety compromised.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in Class G airspace.

Degree of Risk: B.

AIRPROX REPORT No 2009-055

AIRPROX REPORT NO 2009-055

Date/Time: 16 Jun 1325

Position: 5139N 00030E (9nm NW Southend - elev 49ft)

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

Reporting Ac Reported Ac

Type: BA146 PA28R

Operator: Civ Comm Civ Trg

Alt/FL: 3400ft NR

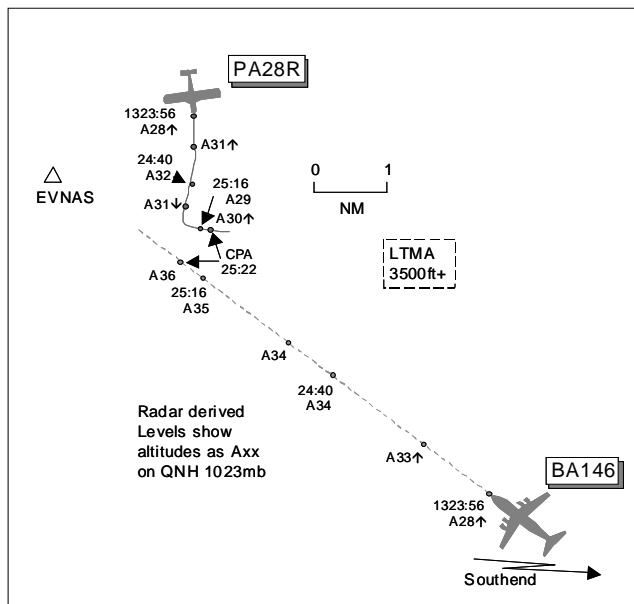
(QNH 1023mb) (QNH)

Weather VMC CLBC VMC NR

Visibility: >10km NR

Reported Separation:
500ftV/c1nm H Not seen

Recorded Separation:
600ft V/0.6nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BA146 PILOT reports en-route from Southend returning to Cranfield IFR and in receipt of a TS from Southend squawking 5003 with Modes S and C. The visibility was >10km flying 500ft below cloud in VMC and the ac was white/blue with strobe, nav and landing lights all switched on. After an approach at Southend they were following a CPT PDR [Preferred Departure Route] heading 310° at 200kt level at 3400ft QNH 1023mb when, approaching EVNAS (LAM R086/11D), a TCAS 'climb' RA popped up. Reacting to the RA, it changed quickly into an 'adjust v/s'. The 3rd pilot occupying the jump-seat eventually picked-up the traffic about 500ft below and about 1nm away. This was only a fleeting glimpse and he thought it was red/orange in colour having the profile of a Sea King's nose but no rotors were seen. Nothing further occurred during their handover to London Control and he was advised that Southend were not in RT contact with the other traffic. He assessed the risk as medium.

THE PA28R PILOT reports he was unaware of being involved in an Airprox until contacted some 2 weeks post incident. He was carrying a general handling sortie with a student in the Hanningfield Reservoir area up to the base of CAS (3500ft) and did not see the reporting ac.

THE SOUTHEND APR reports the BA146 had completed an ILS at Southend and was following a CPT PDR climbing 3400ft under a TS. Unknown traffic to the E of EVNAS (in the Hanningfield Reservoir area) was passed twice to the BA146 crew followed by a call that the ac had turned away and was clear before transferring the flight to London Control on 118-825MHz. The conflicting traffic was not working Southend or known to them.

The Southend METAR was EGMC 1320 10007KT 9999 FEW044 19/11 Q1023=

ATSI reports that the incident took place 9nm NW of Southend Airport in Class G airspace below the LTMA where the base is 3500ft. At the time, the BA146 was in receipt of a TS from the Southend APR. Southend ATC is not SSR equipped. The subject PA28R flight was not in communication with, or known to, the controller.

At 1322:40, the BA146 flight reported turning R for 'EVNAS', following a planned go-around from RW24 at Southend. EVNAS is a reporting point used for Southend departures joining CAS and is 12nm NW of the Airport. Earlier, when the BA146 was being vectored for the ILS to RW24, the flight was issued a CAS joining clearance by the APR "(BA146 c/s) after the missed approach you'll be clear to join controlled airspace on a Compton PDR be a right turn to cross EVNAS altitude three thousand four hundred feet when established inbound to Lambourne you can climb altitude four thousand feet and your next frequency when instructed will be London Control (frequency details)", which was read back correctly. At 1317:50, the flight was given the new QNH 1023mb. The Compton (CPT) is one of six PDRs available for Southend and the UK AIP (AD 2-EGMC-1-8) notes "These routes

do not constitute Standard Instrument Departure procedures, are not assessed for obstacle clearance and are not contained within controlled airspace”.

At 1323:56, the controller passed TI to the BA146 crew “(c/s) there’s unknown traffic...half past twelve five miles manoeuvring level unknown”, which the pilot acknowledges. The radar recording shows this traffic, the subject PA28R, at range 6-7nm, squawking 7000 and both ac indicating at 2800ft altitude Mode C. TI was up-dated, less than a minute later at 1324:40 “(BA146 c/s) that previously mentioned traffic’s still in your half past twelve now three miles right to left”; this information was again simply acknowledged. The unknown traffic had adopted a S’ly track at 3200ft Mode C, the BA146 now level at 3400ft Mode C with lateral separation showing 3-3nm. Finally, at 1325:16, the BA146 flight was informed the traffic was “...passing down your right hand side now contact London Control (frequency)”. The pilot read back the frequency, without any reference to the traffic. The radar recording at this point shows the unknown has turned L onto E and is now in the BA146’s 1:30 position, range 0-7nm at 2900ft Mode C. The BA146, meanwhile, is 600ft above at 3500ft Mode C. By the next sweep (1325:22), the 2 ac are passing abeam, 0-6nm apart, the BA146 now at 3600ft Mode C, though still 600ft above the other ac. Thereafter, the distance between them increases quickly as tracks continue to diverge.

A TS is defined in MATS Part 1, Section 1, Chapter 11, Page 5, as “...a surveillance based ATS, where in addition to the provisions of a Basic Service, the controller provides specific surveillance derived traffic information to assist the pilot in avoiding other traffic. Controllers may provide headings and/or levels for the purposes of positioning and/or sequencing; however, the controller is not required to achieve deconfliction minima, and the avoidance of other traffic is ultimately the pilot’s responsibility”. In addition, the guidance states “The controller shall pass traffic information on relevant traffic, and shall update the traffic information if it continues to constitute a definite hazard, or if requested by the pilot. However, high controller workload and RT loading may reduce the ability of the controller to pass traffic information, and the timeliness of such information”.

On this occasion, the Southend APR passed timely TI, with up-dates, to the BA146 flight, in line with the definition and conditions of a TS which he had agreed with the pilot to provide.

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 to the NW of Southend where pilots are responsible for maintaining separation from other traffic through see and avoid. The PA28R flight had been carrying out GH below the base of CAS and had not seen the BA146 approaching from the SE. The BA146 flight was following a PDR towards EVNAS climbing to level at 3400ft, just below CAS, to then climb into CAS after EVNAS. The Southend APR had seen the PA28R’s radar return tracking S towards the BA146’s projected track and passed TI on it to the BA146 crew. Without the benefit of SSR at Southend, the PA28R’s level was unknown to the APR but the relative tracks indicated a potential confliction, APR updating the TI just over 40sec later. The BA146 had levelled at 3400ft whilst, unknown to the APR, the PA28R had reached 3200ft just over 3nm away. Owing to this geometry, a TCAS RA ‘climb’ was generated on the BA146 flightdeck whilst the PA28R then commenced a descent before turning sharply L to the E. As the BA146 commenced climb the RA softened to an ‘adjust v/s’, the PA28R by now over 500ft below and diverging in plan. Although the BA146 passed unsighted to the PA28R instructor, the BA146 pilot seated on the jump-seat glimpsed the PA28R to his R well below. Although not germane to the Airprox, it was noted that the BA146 crew did not report the TCAS manoeuvre on the RT, and the APR was unaware of its climb when he passed the last updated TI on the PA28R to the BA146 crew during the transfer of control transmission. Taking all of these elements into account, the Board agreed that the actions taken by the BA146 crew following TCAS when combined with the PA28R’s actual flightpath flown had resolved the potential confliction, and that the cause of the Airprox had been a TCAS sighting report with no risk of collision

PART C: ASSESSMENT OF CAUSE AND RISK

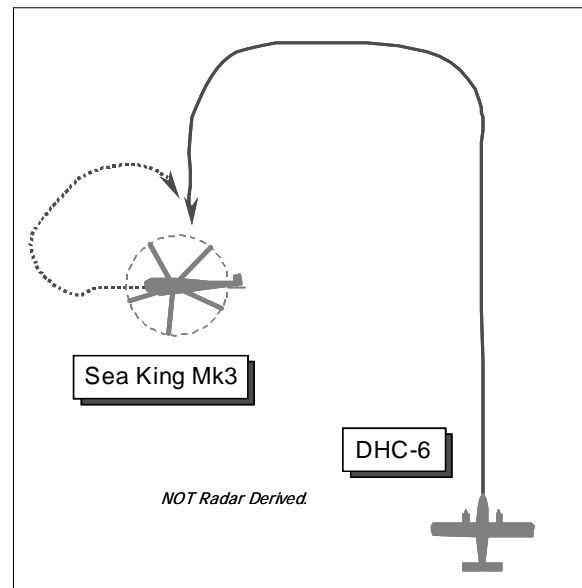
Cause: Sighting report (TCAS).

Degree of Risk: C.

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Date/Time: 17 June 1605
Position: 5319N 00441W (1½nm N of South Stack Light)
Airspace: London FIR (Class: G)
Reporting Ac Reported Ac
Type: Sea King Mk3 DHC-6
Operator: HQ Air (Ops) Civ Comm
Alt/FL: 50ft 185ft
Rad Alt Rad Alt
Weather VMC No Sig VMC NR
Visibility: >10km 10km
Reported Separation:
Nil V/100m H Nil V/250m H
Recorded Separation:
Not recorded



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE WESTLAND SEA KING HAR MK3 PILOT provided a comprehensive report that he was conducting a VFR 'over water' SAR training sortie in VMC and had flown to the Holyhead Harbour area from the W whilst receiving a BASIC service from Valley ATC. A squawk of A3753 was selected with Mode C; neither Mode S nor TCAS is fitted. As Captain of the ac he was seated in the LHS, with his co-pilot in the RHS; the 2 radar operators were looking out from the cabin door, with the winchman looking out on the starboard beam and a supernumerary crew member looking out on the port beam. His SAR helicopter has a distinctive Yellow and Black colour scheme.

At about 1550 – some 15min before the Airprox occurred - he observed other similar helicopters in the vicinity of Holyhead harbour conducting training with a surface vessel. He elected to terminate the BASIC ATS with Valley and speak directly to the other helicopters in the harbour on Stud 11 for deconfliction. UHF, VHF, Marine VHF and HF SAR Ops frequencies were being monitored, but no ATC frequencies were in use at the time of the Airprox.

Operating about 1½nm N of North Stack [Lat & Long given beneath the Valley MATZ stub] with his ac's nose on W in a 50ft hover with the Rad Alt HOLD engaged, the supernumerary crew member saw an ac – a white Twin Otter – in their 8 o'clock some 800m away at a similar altitude, but with no conflict as it passed astern. He selected the ac's upper HISL to White at this point just before the Twin Otter was seen by the winchman in their 5 o'clock position in a L turn. His crew then observed the Twin Otter turn directly towards his helicopter, approaching from their 3 o'clock at the same altitude. To avoid the Twin Otter he took control from the co-pilot, descended to 20ft asl and turned towards the conflicting aeroplane so that he could maintain visual contact. Once it became apparent that the other ac was not going to change heading, they transitioned into forward flight into a climbing turn [UKAB Note: he reported a L turn but the helicopter's own video recording indicates it was actually a continuous turn about to the R] and indicated to the other ac that they were visual; no such sign was made in return. The Twin Otter passed about 100m away at the closest point with a "very high" risk of collision.

After repositioning to recover the training drum he set course to return to Valley, but during their short transit back he was 'scrambled' on a SAROP. The Airprox was not reported on RT whilst airborne because of the high cockpit workload and subsequent SAROP.

In his opinion, and that of his crew, this event constituted a severe risk to Flight Safety as the Twin Otter was flying at 50ft asl.

Although he and his crew were aware that an aerial survey had been ongoing in the vicinity of Valley, the last information he had before launching at 1425 was that there was no survey activity currently in progress; he was not informed by RT that the survey had re-started. His SAR Flight Ops desk received a fax detailing the survey

ac's activity at 1550; the Flight Ops assistant did try to contact them on RT, but to no avail because of terrain shielding. In the Sea King pilot's view the notifying procedure for the survey activity was insufficiently robust and timely to afford appropriate flight planning to be carried out, especially when considering the nature and high intensity of helicopter training carried out in the local area.

The weather was noted as surface wind: 270/15kt; no significant cloud; visibility: >10km.

UKAB Note (1): The SAR unit provided a video recording of the occurrence from a forward facing video camera with audio of the helicopter's intercom. Unfortunately the Twin Otter is not visible within the camera field of view but the recording does give a visual illustration of the manoeuvre flown by the reporting pilot. Moreover, it also confirms the location and timing of the Airprox - the Sea King transitions from the hover into forward flight at a camera time of 1605:30 UTC and then descends. A couple of slight jinks to the L occur before the helicopter enters a ~20° AoB R turn though S onto a westerly track suggesting the Sea King pilot followed the movement of the Twin Otter as it passed to the E.

THE deHAVILLAND DHC-6 TWIN OTTER PILOT reports that he was flying with a co-pilot and navigator whilst conducting a geological survey flight under VFR in VMC. He was receiving a BASIC Service from Valley RADAR on 125.225MHz and had been "cleared to operate" in his survey block by ATC. A squawk of A3726 was issued by RADAR, which was selected with Mode C. Valley RADAR informed him about the helicopters, which he was able to see, and he passed a hovering Sea King about 1.6km away when northbound at 120kt on a 'survey line'. Whilst turning left onto a new southbound line about 2-3nm N of Holyhead at 185ft Rad Alt the yellow Sea King helicopter was about 1.5nm away, before it passed down their starboard side at a range of 250m. The Sea King was at the same altitude as his aeroplane, hovering tail rotor towards them – the Sea King's heading was W as they headed S - but no action was needed to avoid the helicopter. Assessing the Risk as "low", he thought the helicopter crew had "radioed" to him that they could see his aeroplane [see Note (5)].

UKAB Note (2). A NOTAM was not issued for this aerial survey. However, Airspace Utilisation Section issued an ACN for this Unusual Aerial Activity under Activity No: 2009-06-0239 on 14 May 2009. It was stipulated that:

6. The pilot/operator is requested to telephone the ATC unit..[RAF Valley – ATC Supervisor]..prior to departure on each day of the activity...to prenotify the survey details for that day and to obtain any pre-flight clearances necessary.

10. A Systems NOTAM is not required for this activity.

UKAB Note (3) Pursuant to Rule 5(3)(b) (the 500ft rule) and 5(3)(c) (the 1000ft rule) of the Rules of the Air Regulations 2007, a 'permission' was granted by the CAA, on 28 Apr 2009, to the Commander of the Twin Otter to fly within 500ft of persons, vehicles vessels or structures for the purposes of surveying. The 'permission' also stated that the ac shall not fly at a height of less than 800ft MSD in congested areas and 185ft msd over non-congested areas. Furthermore, it was stipulated that the ac shall not fly without agreement from RAF Valley ATC.

UKAB Note (4): This Airprox occurred outwith the coverage of recorded radar.

UKAB Note (5).. It was thought initially that neither ac was in receipt of an ATS from Valley during the period of the Airprox. However, further investigation by UKAB Staff revealed that the Twin Otter pilots had indeed been monitoring the Valley RADAR VHF frequency of 125.225MHz. Consequently, a transcript was requested direct from Valley ATC.

This transcript revealed that the Twin Otter pilot initially called RADAR at 1555:23, about 10 min before the Airprox occurred. The Twin-Otter pilot advised that they were requesting a "*..BASIC service and ready to start [survey] line 1-0 to northbound*". RADAR acknowledged the Twin Otter pilot's request and placed the flight under an ATS "[Twin Otter C/S] *roger BASIC Service Holyhead [RPS] 1-0-0-4*". A squawk of A3726 was then issued by RADAR, which was acknowledged. At 1557:42, RADAR passed general traffic information to the Twin Otter pilot "[Twin Otter C/S] *we've got some rotaries working just to the west of Valley at this time low-level*". The Twin Otter pilot advised at 1558:03 that he was "*..operating below 8 hundred feet*", which RADAR acknowledged "*..roger*". A short while later at 1558:30, the Twin Otter pilot reported to RADAR that "[Twin Otter C/S] *we go into low-level now*", whereupon there appeared to be some RT reception difficulty by RADAR as the controller requested a repeat transmission. The message appears to have been understood and finally acknowledged at 1559:57, just before

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RADAR questioned the pilot “[Twin Otter C/S] *are you visual with a er rotary working in your area approximately 12 o'clockish [sic]*”, just over 5½min before the Airprox occurred. Moments later at 1600:05 the Twin Otter pilot confirmed that he was visual - “*affirm [Twin Otter C/S]*”, which RADAR immediately acknowledged. No further transmissions are recorded until about 45sec before the Airprox when the Twin Otter pilot reported at 1604:48, “[Twin Otter C/S] *next line nav applied southbound*”, which RADAR immediately acknowledged with the Twin Otter's C/S. No comment was made on 125.225MHz by either of the pilots involved or the controller over the period when the Airprox occurred, about 1605:30; the next transmission was from the Twin Otter pilot reporting the next line northbound at 1610:41.

At 1616:01, over 10min after the Airprox occurred the Twin Otter pilot reported “*..next line number 8 southbound*”, which RADAR acknowledged some 7sec later with “[Twin Otter C/S] *roger*”. At 1616:20, the Sea King pilot called the Twin Otter direct on 125.225MHz, using the ac's C/S, “[Twin Otter C/S] *this is [Sea King C/S] in the hover in your 12 o'clock we are unhappy with the clearance you are affording us here*”. To which the Twin Otter pilot replied at 1616:32, “*In sight we are happy*”. This transmission was acknowledged by the Sea King pilot who stated at 1616:37, “*Roger happy you are passing behind this time.*”

The foregoing RT exchange from 1616:01, might have suggested that the Airprox occurred slightly later than reported; however, the Sea King pilot believed that this RT exchange occurred as they were recovering the training drum. He stated that the Sea King crew made no RT transmissions to the Twin Otter pilots at the time of the Airprox at about 1605:30. The helicopter pilot reports that there were no other Sea Kings outside the Holyhead Harbour vicinity at the time of the Airprox; he reaffirmed that the 50ft hover was maintained with the Rad Alt HOLD and he was not operating at the height of the Twin Otter - 185ft Rad Alt from the Twin Otter pilot's account.

HQ AIR (OPS) comments that it would appear that the Twin Otter pilot had the Sea King in sight during the encounter. However, by manoeuvring his ac to within a few hundred metres of the Sea King, without the SAR crew knowing his intentions, he passed close enough to cause them concern. It may be that, as he was on a task, he felt he was unable to provide more clearance and still remain on his required lines. However, other traffic must be taken into consideration and the plan changed or communication established.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Whilst the Sea King crew might have been surprised to encounter a fixed wing ac operating at the low altitudes reported here, it was apparent that the Twin Otter pilot was operating legitimately whilst executing his survey task. It seemed that flight at low altitude was critical to the satisfactory outcome of the survey and so ‘permission’ had been granted accordingly, but Members were curious that a NOTAM had not been issued for this Unusual Aerial Activity. The Board was briefed that AUS had advised that the weather dependant nature of the flight, and consequently the indeterminate dates and times on which the flight would take place over a three month ‘window’, coupled with the size of the survey area, which extended from the coast eastwards across the breadth of N Wales, precluded a meaningful warning. The DAP advisor pointed out that the Twin Otter's survey task could have been notified under a CANP, but for this survey it was left to the Twin Otter pilot to communicate his intentions to Valley ATC as specified in the ACN issued by AUS for the Survey. No concerns had been raised by the ATSU about the pre-notification of these flights by the Twin Otter pilot, but it was clear from the Sea King pilot's account that only after he had departed on his training sortie was his Ops Desk notified of the survey flight. The limitations of radio coverage prevented his Ops clerk from providing earlier forewarning it would seem, albeit only about 15min before the Airprox occurred.

The Sea King pilot was not monitoring the Valley RADAR frequency and thus had no warning either from ATC, or from monitoring the transmissions from the survey ac, before the Airprox occurred. Conversely, the Twin Otter crew was in constant contact with Valley RADAR during the encounter and, whilst only in receipt of a BASIC Service, had acknowledged warnings from the controller about the presence of some rotary-wing traffic in the vicinity. Moreover, APP had endeavoured to pass specific traffic information about a helicopter on at least one occasion some minutes before the Airprox occurred, which it seemed might have been about the subject Sea King but this was unclear. Therefore, ATC had some real-time information about the progress of the survey flight even down to the individual survey ‘lines’ the aeroplane was running, albeit perhaps not continuously, and experienced controller Members pointed out that it might have been preferable for the helicopter crew to have been in contact

with Valley RADAR whilst operating beneath the MATZ stub. The DAP advisor stressed that the higher radiated power of ATC transmitters might also have facilitated better RT communications compared to the Ops frequency - a constructive learning point.

As it was, the Sea King crew was unaware of the low-level survey ac until they spotted it themselves. This was just before the Twin Otter completed its northbound 'line' whilst passing clear astern, whereupon the winchman saw it turning towards the helicopter and the Sea King pilot elected to move from the hover, attain some airspeed and thus some freedom to manoeuvre if necessary. This was a wise precaution in case the situation deteriorated, but from the Twin Otter pilot's perspective, it was unnecessary because he had the hovering Sea King in sight whilst turning L on to the southbound survey 'line' and thus before the Sea King transitioned from the hover.

It seemed to the Members that the Twin Otter pilot was content that he had adequate separation from the Sea King, increased perhaps by the Sea King's later westbound movement and descent to 20ft. Whereas both pilots reports agreed that there was no vertical separation as the Twin Otter passed by, it was evident that there was a difference between the reported altitude of the Sea King and that reported by the Twin Otter pilot of 185ft Rad Alt. Before descending, the Sea King pilot reports hovering at 50ft asl with the AFCS Rad Alt Hold engaged when the Twin Otter was spotted at a similar altitude. Although 230ft of winch cable was available it seemed inconceivable to the Board that he would have made a mistake on this point. Conversely, it seemed to pilot Members that the Twin Otter crew would be expected to maintain accurate height keeping – at 185ft Rad Alt – and Members perceived this altitude would be quite critical in order to achieve his survey objectives. There seemed little reason to descend lower, unless the Twin Otter had unintentionally lost height in the turn, but without a radar recording showing Mode C data from both ac during the encounter it was not feasible to resolve this disparity and measure either the vertical or horizontal separation that actually pertained.

The Board recognised that in their own way both of these pilot's were constrained in their ability to manoeuvre: the Sea King in the hover and the Twin Otter aiming to establish his new track accurately on his predetermined survey line. One Member suggested that prior to the Sea King's manoeuvres perhaps the Twin Otter pilot had not realised that the helicopter was established in a hover and, perhaps unwilling to stray off-track, assumed the helicopter would be further away to the W when he passed by. However, this was a solitary view amongst the Membership and the JHC Member pointed out that with the Sea King in the hover at 50ft the downwash would have been significant and the stationary hover should have been readily apparent to the Twin Otter crew.

In concluding their assessment of Cause and Risk there were some aspects of this Airprox that Members could not resolve. Nevertheless, it was clear that whilst justifiably concerned about the vulnerability of their helicopter in the hover, through good look-out and crew co-operation the Sea King crew had spotted the survey ac and tracked its movement carefully; this enabled them to break from the hover, gain airspeed and hence manoeuvrability, suggesting to some that any potential conflict had been forestalled by the Sea King pilot's prompt actions. However, it was also evident that the Twin Otter pilot had been warned of rotary wing activity in the vicinity by RADAR, was aware of the Sea King as he turned about and was able to afford the helicopter a wider berth if needs be, either vertically or horizontally. It was the Twin Otter pilots that ultimately chose the final separation and, notwithstanding the anomalies of the vertical disposition of the two ac, the Board concluded that this Airprox had resulted because the Twin Otter crew flew close enough to the hovering Sea King to cause its crew concern. Furthermore, given the visual sighting by both crews and the subsequent avoiding action by the Sea King pilot, Members agreed unanimously that no risk of a collision had occurred in the circumstances conscientiously reported here.

PART C: ASSESSMENT OF CAUSE AND RISK

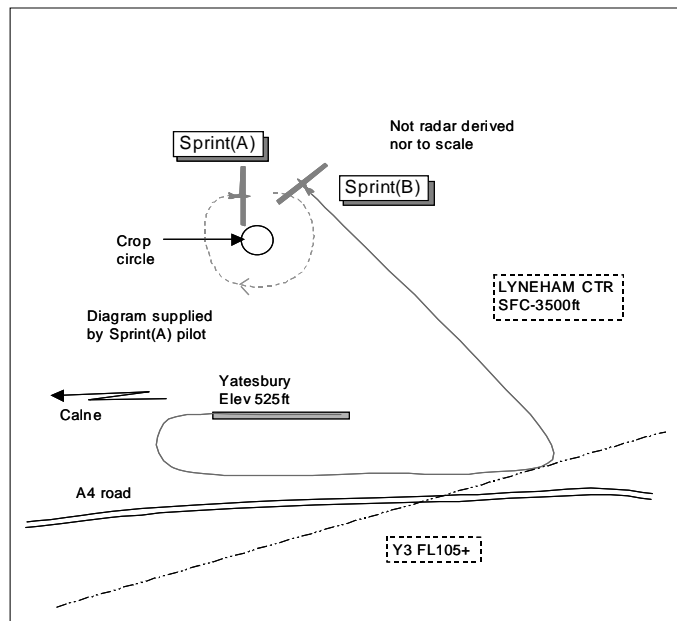
Cause: The Twin Otter crew flew close enough to the hovering Sea King to cause its crew concern.

Degree of Risk: C.

AIRPROX REPORT No 2009-057

AIRPROX REPORT NO 2009-057

Date/Time: 12 Jun 1134
Position: 5127N 00155W (0.5nm N Yatesbury
Microlight Strip - elev 525ft)
Airspace: Lyneham CTR (Class: D)
Reporting Ac Reported Ac
Type: Thruster T600N Thruster T600N
Sprint(A) Sprint(B)
Operator: Civ Pte Civ Trg
Alt/FL: 800ft QFE NR ↑
(QFE 1004mb) (QFE)
Weather: VMC CLBC VMC NR
Visibility: >10km >50nm
Reported Separation:
Nil V/45m H Nil V/50m H
Recorded Separation:
NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE THRUSTER T600N SPRINT(A) PILOT reports flying a local sortie from a private site near Melksham with a passenger VFR and in receipt of a BS from Lyneham on 123.4MHz; no transponder was fitted. The visibility was >10km flying below cloud in VMC and the ac had a blue/white body below a blue wing and tail, and dual wing-strobes were switched on. He obtained clearance at Devizes into the Lyneham Zone not above 1000ft QFE 1004mb routeing towards Avebury then Melksham. This took him NE of Cherhill whitehorse/monument N of the A4 road towards a crop circle field situated 1km N of Yatesbury Microlight site. About 4-6km away he could see an ac at the holding point for RW28 at Yatesbury. He decided to orbit the crop circle to take photographs and performed a tight 60° R turn at 50kt at 800ft agl, pointing out to his passenger that the other ac was taking-off. He was familiar with Yatesbury operations, having trained there as a student, knowing that all operations are to the S non-radio unless clearance is obtained from Lyneham. He then observed the other ac, an identical type to his, perform a non-standard very tight LH cct pattern reaching a very short base leg position before cutting base and turn NW'ly directly towards their position whilst gaining height throughout. Owing to his orbit he was losing sight of this ac momentarily in the turn but regaining sight of it as much as he could. This was requiring a lot of work monitoring his flying, the other ac and his position over the crop circle to allow his passenger to take photos. After another orbit the other Sprint was observed extremely close, about 300ft distant, bearing almost straight at his position and it would have passed 100ft away had he not initiated an even tighter RH break turn. This brought his ac close to the stall so he added power and allowed the ac to descend in the turn, to break down and to R of the other ac. He estimated at the CPA that separation 45m. People were present on the ground below them but he was still approximately 500ft above them when he turned back to the E and flew at a lower level out of the area. He reported the Airprox to Lyneham on RT and he assessed the risk as very high. The other Sprint, which had a dark coloured wing, was now orbiting anti-clockwise in his original position so it had also turned in his direction as he passed by.

THE THRUSTER T600N SPRINT(B) PILOT reports flying dual training sortie from Yatesbury VFR and making initial contact with Lyneham; no frequency was stated. The visibility was >50nm in VMC and the ac was coloured black; no lighting was mentioned. Whilst instructing a student in take-off and climb out at 250-300ft agl, another ac was seen circling below their height. He took control and continued the climb and turned R in an attempt to identify the ac. He closed within 50m of the other ac, another T600N coloured blue/white and established its identity. Both ac were turning in opposite directions, and he thought that when the other pilot saw that he had turned to identify his ac its pilot commenced a rapid climbing turn and flew away to the ENE. He also thought that the other pilot was aware of his position so no avoiding action was necessary and he assessed the risk as low.

DAATM reports that Sprint(A) was conducting a sightseeing flight which was partially within the Lyneham CTR. The flight was in receipt of a BS from Lyneham Zone and had been instructed to fly not above 1000ft Lyneham QFE 1004mb. No radar replay was available for this investigation.

At the time of the Airprox, Lyneham Zone was busy with multiple tracks requiring a BS and several ac requiring CTR transit. Sprint(A) pilot called Zone at 1125:20 and advised that the ac had 2 persons on board and required routing Melksham, NW Devizes, entry in to Lyneham CTR to the E of Calne by the Yatesbury microlight site and out via Avebury; he did not have a transponder fitted and required a BS. Zone stated "*Basic Service*" and then immediately continued working other traffic on frequency under a TS. At 1128:05, in preparation for CTR transit approval, Sprint(A) pilot was asked "*what is your altitude?*" to which he replied "*Ah yes Sprint(A) c/s receiving*". Sprint (A) pilot was again asked to state current altitude to which he replied "*altitude on QNH 1015 is 1200ft.*". At 1128:18 Sprint (A) was granted entry into the Lyneham Zone "*Sprint(A) c/s roger, you are clear to enter Lyneham controlled airspace not above height 1000ft on the Lyneham QFE 1004 report exiting the Zone at Avebury.*" Sprint(A) pilot acknowledged the clearance but requested a repeat of the end of the message, Zone reiterated for Sprint(A) to report exiting the CTR at Avebury. At 1128:39, Sprint(A) pilot reported "*Exiting at Avebury and VFR.*" Zone continued to work a busy traffic load without further contact with Sprint(A). At 1134:48 Sprint(A) informed Zone "*Lyneham I'd like to report a near miss with an aircraft at Yatesbury he's taken off and just flown straight at us.*" Zone interrupted a handover with Yeovilton to reply to Sprint(A) "*Sprint(A) c/s roger there is microlight flying around Yatesbury area, caution there is an airfield there.*" Spint(A) pilot replied "*Affirm, yes I saw him taking off but he's sort of circling overhead and eh swooping down at the moment I think I better leave the area because he's acting a bit dangerously.*" Zone acknowledged and bid Sprint(A) pilot good day. From the Lyneham's unit reports, it is acknowledged that an information call about Yatesbury microlight site being active may have assisted Sprint(A) in keeping clear. However, Zone was busy with multiple tracks, some requiring a TS and, therefore, of a higher priority. Also, when Sprint(A) initially called Zone he indicated that his intended route was close to Yatesbury microlight site. It was reasonable for the controller to assume that the pilot was aware of the site. Furthermore, the pilot of Sprint(A) stated that he was visual with the microlight he was concerned about and therefore, there was nothing else Zone could have done to assist him. Zone stated that Sprint(A) painted a weak picture on radar, if at all and that only an intermittent radar contact of Sprint(A) was observed and nothing was showing at Yatesbury. Under the conditions for BS iaw CAP774, there is no requirement for a controller to maintain radar contact with ac in receipt of this service.

No RT calls were received at Lyneham from Sprint(B) pilot.

The Lyneham Part3 states "*The LOA between RAF Lyneham and microlights operating at Yatesbury states that circuits are to flown to the South of Yatesbury and that circuit height is to be 600ft AGL or 1200ft AMSL. Further, it states that "...all General Handling sorties/profiles are to be flown clear of Lyneham Class D airspace*".

Lyneham SATCO has included in the Zone Controller Orders that ac known to be transiting sufficiently close to Yatesbury Microlight site be informed of known activity.

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

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members noted that the investigation revealed that no RT calls were received by Lyneham ATC from the pilot of Sprint (B) and that the flight had entered Class D CAS without clearance during this incident. This factor, however, had not affected the outcome, per se. Sprint (A) pilot had obtained entry clearance into the CTR from Lyneham Zone and had routed N of the microlight site at Yatesbury to the crop circle. On seeing Sprint (B) taxiing at Yatesbury, Sprint (A) pilot had assumed that Sprint (B) would either remain to the S of Yatesbury in compliance with the Lyneham LOA or that Sprint (B) pilot would call on the frequency if he needed to fly to the N of the microlight strip. Members questioned the airmanship displayed by both pilots (A) and (B) during the ensuing encounter. Sprint (A) pilot had seen Sprint (B) depart and, when this ac turned towards his position, had continued to orbit without taking any action to deconflict their flightpaths i.e. roll out of the turn to maintain visual contact with the other ac. Similarly, Sprint (B) pilot had seen Sprint (A) circling to the N of Yatesbury and had intentionally flown

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towards Sprint (A) to establish its identity without knowing its pilot's intentions. In doing so, the pilot of Sprint (B) flew sufficiently close to Sprint (A) to cause concern to its pilot and this had caused the Airprox.

Risk wise, Sprint (A) pilot had seen Sprint (B) depart and fly towards his position and had tried to monitor its approaching flightpath whilst he continued his photo task but had been surprised when he saw separation had suddenly reduced to 300ft laterally; he quickly took avoiding action and the other ac passed 45m away. Sprint (B) pilot had deliberately flown his ac close to Sprint (A) and had chosen the miss distance/separation of 50m. Although this had been a close encounter, Sprint (B) pilot was always in a position to alter his flightpath should it be necessary, which was enough to persuade the Board that any risk of collision had been effectively removed.

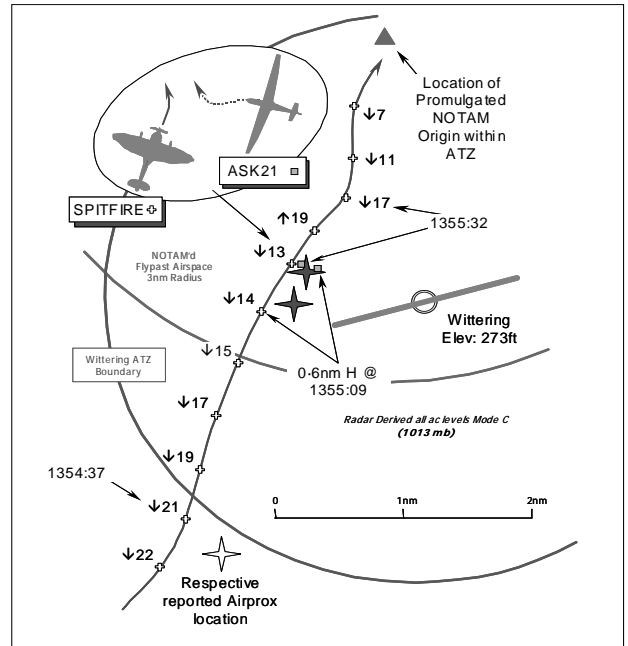
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The pilot of Sprint (B) flew sufficiently close to Sprint (A) to cause its pilot concern.

Degree of Risk: C.

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Date/Time: 21 Jun 1355 (Sunday)
Position: 5237N 00030W (1nm WNW of Wittering A/D - elev: 273ft)
Airspace: Wittering ATZ (Class: G)
Reporting Ac Reporting Ac
Type: ASK21 Supermarine Spitfire MkVb
Operator: Civ Pte HQ Air
Alt/FL: 1400ft 1300ft ↓
agl RPS (1021mb)
Weather VMC Sky Clear VMC NR
Visibility: >20km 30km
Reported Separation:
Nil V/50m H 30ft V/200m H
Recorded Separation:
Not recorded



BOTH PILOTS FILED

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE ASK21 GLIDER PILOT reports that he winch launched from Wittering off RW26 for a local area flight within the Wittering ATZ and was in communication with the Glider Site – C/S WITTERING GLIDERS - on 130.1MHz. Turning R to the N, towards another glider that was circling in order to use the lift, it became apparent that this lift was not particularly strong so he continued in a N – NW’ly direction to a point between the village of Easton-on-the-Hill [1½nm NW of Wittering ARP] and the threshold to Wittering’s RW08 at which point he felt lift under the left wing. Conducting a good lookout before turning, he saw no other traffic and rolled his glider into a 30° AoB L turn to enter the thermal. Turning L through 270° at 45kt, he then spotted a green object – silhouetted against the blue sky - moving at speed over the wooded area of Vigo Woods about 500m away and some 300-400ft below his glider. The aircraft – which he recognised as a camouflaged Supermarine Spitfire - began to climb whereupon he executed a full control movement to the R to turn in an attempt to avoid the Spitfire. He had returned to a “wings level” position when the Spitfire crossed his nose from L – R, about 50m ahead at the same height as his glider – that was at about 1400ft agl – with a “very high” risk of a collision. Once the Spitfire had passed, he executed a “normal” cct and landed back at Wittering. He added that his flight duration was 6 min. His glider is coloured white with a red nose and red tips to wing and rudder.

UKAB Note (1): In a subsequent telephone conversation with UKAB staff, in addition to other supplementary information the ASK21 glider pilot advised that he was aware of the details of the NOTAM promulgating the Spitfire Flypast at Stamford.

THE SUPERMARINE SPITFIRE MkVb PILOT reports that whilst returning to Coningsby from Kemble he was tasked with executing a flypast at Stamford, which was the subject of a NOTAM. After switching from Coventry ATC to Cottesmore and receiving no response to his call, he transmitted his position and intentions ‘blind’ on 130.2MHz [UKAB Note (2): The Cottesmore VHF LARS frequency and that notified for contacting Cottesmore ATC, the controlling ATSU for the Wittering MATZ.]

Operating VFR in VMC some 2000ft clear below cloud with an in-flight visibility of 30km, after leaving the Initial Point of a ‘Target run’ to complete the NOTAM’d flypast at Stamford, descending, heading 030° at 220kt, he noted a significant feature on the ground during the ‘run-in’. Very briefly checking his map to ensure he was in the correct position, on looking out he spotted a glider – a two seat white “conventional” glider with orange panels around the cockpit and possibly on the tail - in his 1230 position some 200m away crossing from R – L and slightly below his

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aeroplane. Descending through 1300ft BARNSELY RPS (1021mb) at that point, to avoid the glider he applied power and broke hard upwards and to the L as the glider passed 200m away at the closest point some 30ft below with a “high” risk of a collision. Once he was confident that he had cleared the glider, he reversed his L turn to check the position of the incident before continuing on a NE'ly course to Stamford.

Upon landing he contacted the CFI's of two local gliding clubs but neither had any knowledge of the incident. He endeavoured to contact the gliding club at Wittering but was informed by the Guardroom that they were not gliding that weekend. SSR Modes C and S are fitted.

UKAB Note (3): During a candid and detailed telephone conversation with UKAB staff, the Spitfire MkVb pilot acknowledged that he was unaware of gliding taking place at Wittering during the period of his flypast. Had he been, he would certainly not have planned his route through Wittering as he did. He observed frankly that the symbology within the current Advanced Mission Planning Aid (AMPA) database depicting gliding at Wittering and extracted from the UK LFC was missed during the sortie planning but he stressed that in his view it is very small and too easily overlooked compared to other autonomous glider sites. Moreover AMPA waypoint symbology from the outbound track obscured the 'G' Symbol.

UKAB Note (4): NOTAM H1597/09 was promulgated by AUS for the Spitfire pilot's flypast at Stamford Lincs within a 3nm radius of 52°39'N 000°29'W – that is just within the ATZ boundary - from the surface to 2000ft amsl and active between 1355-1425 UTC on this day. As is the norm for a flypast, an Airspace Co-ordination Notice (ACN) was not issued for this particular Unusual Air Activity (UAA).

UKAB Note (5): For civilian pilots, the UK AIP at ENR 2-2-2-5 notifies the Wittering ATZ as a circle radius 2½nm centred on RW08/26, extending from the surface to 2000ft above the aerodrome elevation of 273ft amsl and notified active H24 for the purposes of Rule 45 to the 'Rules of the Air'. According to the Reference, Cottesmore APPROACH provide a 'service' H24 on 130.2MHz.

UKAB Note (6): The same dimensions of the Wittering ATZ and those of the MATZ are promulgated in the Mil AIP at AD2-EGXT-1-7 for the information of military aircrews. A further Note is contained at AD2.23 – ADDITIONAL INFORMATION:

“..Wittering now Hosts [xxx] Gliding Club, Operating hours are Fri evenings and between SR –SS on Sat, Sun and PH. OT by NOTAM. Winch, aerotow and motor glider ops up to 3000ft agl. Frequency 130.100[MHz] and callsign “Wittering Gliders”.

Furthermore, the military Low Flying Handbook (LFH) requires pilots of “light propeller driven ac” (LA) – at a MAUW 3071kg the Spitfire Mk Vb is a LA - to comply with the airspace restrictions within the LFS when operating below 2000ft agl/amsl. Thus the LFA6 brief required the Spitfire pilot to 'avoid' the GS at Wittering by 2nm Fri-Sun SR – SS with a note that they winch launch to 3000ft agl.

UKAB Note (7): The Claxby Radar recording does not illustrate this Airprox clearly as the glider flown by the reporting pilot cannot be identified with certainty and only a few returns are displayed which may or may not be the subject ASK21 glider. However, the Supermarine Spitfire Mk Vb, identified from its Mode S ac ident, is shown proceeding NNE toward the location of the flypast descending through 2100ft unverified Mode C (1013mb) at 1354:37. Maintaining a gradual descent the Spitfire is shown at a range of 2.29nm from the Wittering ARP descending through 1900ft Mode C – which would equate to an altitude of about 2140ft BARNSELY RPS (1021mb) [+240ft on SAS] and thereby penetrating the notified upper limit [2000ft aal] of the Wittering ATZ at 2273ft amsl. At 1355:09, the Spitfire is shown within the NOTAM'd flypast airspace descending through 1400ft Mode C – about 1640ft amsl RPS - when a single primary contact is shown at 1 o'clock - 0.6nm range, which might be the ASK21. However, it might also be the other glider reported by the ASK21 pilot to be operating in that vicinity: hence the identity of this contact cannot be confirmed. In between sweeps the Spitfire passes abeam the Airprox location reported by its pilot and is next shown at 1300ft Mode C – 1540ft RPS - marginally to the WNW of the location reported by the ASK21 pilot but no other primary contacts are evident at this point. However, on the next sweep the Spitfire pilot's reported avoiding action 'Break' is evident with an instantaneous increase in the Spitfire's Mode C shown indicating 1900ft – about 2140ft amsl. A primary contact that might be the ASK21 is shown at 1355:32 – after the Airprox has occurred – just as the Spitfire resumes the descent and run-in towards the location of the NOTAM promulgated Flypast origin. No other primary contacts are apparent.

MIL ACC reports that both pilots had access to the NOTAM. Mil ACC involvement was limited to the dissemination of the information as both Wittering ATC and Cottesmore ATC were closed at the time of the incident.

It was confirmed that the Wittering entry in the FLIP BINA included gliding at Wittering in the remarks and that the ATZ status is H24. On military LFCs a small letter 'G' is marked within the Wittering MATZ denoting it as a glider site. Therefore, this should all have been apparent to the Spitfire pilot at the time of his pre-flight planning. The gliding activity is promulgated in the Civil and Military AIPs, the Low Flying Handbook and the BINA. The NOTAM provided details and timings of the Spitfire flypast. It is not unreasonable to have expected Airspace Utilisation Section at DAP to have identified the effect of the flypast on other known activities; however, this does not absolve the pilot of his responsibilities. ATC Wittering also provided a pack-up of NOTAMs to the Gliding Club that included the flypast NOTAM. Therefore, the gliding club duty instructor (and pilots) knew about the flypast from the NOTAM but may not have appreciated the impact on their operations.

Most military airfields are designated as H24 due to the variance in their operating hours. This is considered to be a fail-safe system rather than risking an unauthorised entry whilst the unit is active. In addition the protection from over-flight provides an element of security to the unit out of hours. Within the summary on page 47 of the Flight Information Handbook (FIH) it is quite clear that all pilots - military and civil - are to remain clear of an ATZ unless permission is granted by the ATC Unit or information obtained from the A/G station. This is further e

The Gliding Club is permitted to operate within the Wittering MATZ and ATZ with the permission of ATC when open. When ATC is closed, the Club uses standing clearances that are incorporated in the Flying order Book (FOB) and in Station Routine Orders.

SATCO Wittering has taken the following action: They have issued a NOTAM to remind airmen of the gliding activity and that the ATZ is active H24. An amendment to the BINA has also been submitted to AIDU to add the watch frequency for the gliding Club (130.1MHz). The CFI of the gliding club shall also ensure that the Gliding Club listens out where possible to 130.2MHz [the notified MATZ/ATZ penetration frequency] during gliding operations.

HQ AIR OPS comments that what seems, at first sight, as a straightforward encounter brings out a list of process problems which conspired to bring the two together. I will restrict my written comments and look forward to a wide-ranging discussion.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board was briefed that discussions with the Spitfire pilot's Unit had reflected a wish to learn the key flight safety lessons from this Airprox. There were important issues highlighted here, which needed to be thoroughly addressed to safeguard all airspace users as much as possible.

The glider pilot had executed a winch launch from Wittering aerodrome – plainly a 'Government Aerodrome' - that was utilised by this civilian gliding club at weekends and other times with the full permission of the aerodrome operating authority. In order to accomplish his mission at Stamford – just N of Wittering - the Spitfire pilot had to penetrate the Wittering ATZ and the associated low-flying avoidance for the gliding activity. For the benefit of civilian pilots, the UK AIP promulgates details of Wittering aerodrome and its associated ATZ, radius 2½nm, which is also notified as a winch-launch glider site. The Military LFH promulgates to military crews details of the mandatory avoidance criteria specified for the glider site – radius 2nm – and the UK Mil AIP adds a warning of the winch launch and aerotow activity. Whilst the Wittering MATZ is shown on military LFCs clearly, when the aerodrome and its ATSU is not open for its military task, the MATZ 'collapses' and is no longer extant. The Spitfire pilot reported that he had called Cottesmore on 130.2MHz - the promulgated MATZ Crossing frequency – but, receiving no response to his call, had transmitted his position and intentions 'blind' and continued on to his 'IP to target run'. Whereas the procedure adopted here was sound for penetrating a MATZ – broadly, if after two consecutive calls no response is received, pilots should proceed with caution – this does not hold true for an ATZ. It was noted by the Board that the ATZ is not marked on military LFCs. As usual on a Sunday afternoon, both Cottesmore and Wittering ATC were closed; however, the ATZ remains extant 'H24' and is 'notified' as such. If ATC is not manned and the promulgated frequencies are not monitored, clearly there is no immediate means of

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obtaining 'permission' to enter the ATZ. Whereas the Gliding Club operates on 130.1MHz, this is neither established nor promulgated as an 'Air/Ground Station'. Thus there was no obvious means whereby the Spitfire pilot could call up on RT to obtain 'information' to enable the flight into the ATZ 'to be conducted with safety' as is required by Rule 45 of the Rules of the Air Regulations within the Air Navigation Order for civilian pilots. In broad terms, military aircrew in the course of their duty are exempted from the majority of the provisions of the ANO; however, the essential elements of Rule 45 are mandated for military pilots within the Mil AIP at ENR 1-4-3 and reiterated in the FIH (but incorrectly noted as Rule 39). The annotation in the UK AIP at ENR 2-2-2-5 that Cottesmore APPROACH provides a 'service' H24 on 130.2MHz is incorrect; Cottesmore ATC was not open on this occasion and military Members were aware that Cottesmore ATC would be unlikely to be open at the majority of weekends. RAF FLIP ERS BINA notes neither Cottesmore nor Wittering ATC is open at weekends - but the entries do include "ATZ H24". Thus prior consultation with Wittering ATC was necessary before the flight to enable the Spitfire pilot to enter their ATZ to accomplish his flypast with safety. The Mil ACC Advisor briefed the Board that, in light of this Airprox, the 'H24' annotations for service promulgated for certain ATSUs is being reviewed; the Board requested that they be apprised of the outcome in due course. Nevertheless, the conclusion here is that, unless there is an emergency, pilots who have not obtained permission from the ATSU prior to the flight nor made radio contact must remain clear of the ATZ. This is to ensure the safety of aerodrome traffic in the critical stages of take-off and landing is not compromised by traffic entering the ATZ unannounced. Moreover, the military LFH required the Spitfire pilot to comply with the airspace restrictions and avoidances specified within the LFS when operating below 2000ft agl. The LFA6 brief required him to avoid the gliding site at Wittering by 2nm Fri-Sun SR – SS, with a note that they winch launch to 3000ft agl.

It was plain to the Board from his laudably frank comments, that the Spitfire pilot had missed the small 'G' symbology on the military LFC and was entirely unaware of the gliding activity at Wittering; this, the Members agreed, was intrinsic to the Cause. The Board accepted the pilot's point about the conspicuity of the 'G' on the LFC and AMPA which, together with the absence of any reference to the ATZ, required remedial action. The Board agreed a Safety Recommendation that the MoD should review the glider site symbology and the representation of ATZs on military LFCs and within associated Mission Planning Aids with the aim of improving their conspicuity and clarity.

Had the Spitfire pilot been aware that gliding was taking place at Wittering he would likely have endeavoured to liaise with the gliding club. In fact, no co-ordination with the gliding club had been effected beforehand by Wittering ATC, AUS or the Spitfire pilot's Unit, despite the flypast constituting an Unusual Air Activity as defined in JSP552. Evidently, a NOTAM had been issued, promulgating to other airspace users the flypast taking place at Stamford. Indeed Wittering ATC had provided a copy of the NOTAM to the Gliding Club and the ASK21 pilot was aware of its contents. The Board was briefed that the CGI had contended that his Gliding Club would have been content to suspend their gliding operations during the period of the flypast if they had been asked to do so, and would have welcomed the opportunity to watch the Spitfire fly through. In the absence of any co-ordination measures, they continued to operate throughout the promulgated period of the flypast believing, perhaps understandably, that contact would have been made beforehand if the Spitfire pilot was intending to transit through the ATZ/GS. Whether this was wise was debatable; however, for the Spitfire pilot to complete his task, something clearly had to be done to allow him to enter the ATZ/GS avoidance and thus complete his flypast with safety.

The Board noted that the Spitfire pilot would not have routed through the gliding activity had he been aware of it. Nevertheless, Members were concerned that errors at the planning stage and insufficient co-ordination had been at the root of this Airprox; neither the Unit nor AUS who issued the NOTAM had noted that the task could not be completed legitimately without some form of permission or dispensation from the Regulations. It seemed to the Board that the military procedures laid down for UAAs had not served the Spitfire pilot well. Members recognised that while an ACN was not issued for this UAA, and might not have been warranted, airspace specialists should have identified the potential for a conflict. The Board was briefed on the broad content of the regulations in JSP 552 – 215; the Airspace Utilisation Section (AUS) is the national airspace co-ordinating authority for UAAs in UK airspace: *"the AUS will identify the airspace and flight safety requirements of the UAA and its effect on other known activities"*. Furthermore, *"When an incompatibility between airspace users is identified by the AUS, the importance or priority of overlapping activities will be established by AUS in consultation with the affected agencies...to encourage participating parties to agree an allocation of airspace"*. Plainly this did not occur; had it done so, it would have forestalled this Airprox. The DAP Advisor from AUS explained that NOTAMs are the primary means of notifying UAAs to other airspace users; ACNs are not routinely issued for flypasts such as this one. He did not agree that AUS should have done more than issue the NOTAM for this flypast; AUS do not have the capacity to effect detailed co-ordination for all the flypasts that take place in UK airspace and, in his view, it was a pilot's

responsibility to consult with other agencies affected by his UAAs. In general, AUS will only take action to de-conflict UAAs from other notified UAAs. This seemed at odds with the spirit and apparent intent of the regulations. To complete his task the Spitfire pilot required dispensation from certain aspects of airspace legislation and/or a priority accorded over the use of the NOTAM'd airspace. Whilst the Board agreed that the Spitfire pilot or his Unit should have identified these issues at the outset, the incompatibility of the Spitfire pilot's task in a promulgated ATZ, and adjacent to a notified winch-launch glider site and its concomitant LFS avoidance, should also have been evident to the airspace specialists at AUS. In the Board's view, action was needed to review the co-ordination process for such activities. The Board agreed, therefore, to make a Safety Recommendation to the MoD for a review of the co-ordination arrangements for UAA involving military ac, such as occurred here in regulated airspace, to ensure the safe de-confliction of UAAs where they impinge on other established but incompatible air activities.

In finalising the Cause, Members considered whether the Gliding club should have continued to operate in the light of the NOTAM. Some Members were of the view that gliding should have been either suspended or the gliders should have cleared the vicinity for the duration of the NOTAM period. Moreover, one Member contended that the glider pilots themselves were not operating in conformity with Rule 45 of the 'Rules of the Air'. However, as the Club operated with the full permission of the aerodrome operating authority this was a solitary view. The glider pilot was operating legitimately in the ATZ when he saw the Spitfire at a relatively late stage and turned to avoid it. Similarly, the Spitfire pilot saw the glider somewhat late, leading some Members to believe that this was a sighting/lookout issue. However, it was clear that that the Spitfire should not have been operating through this airspace unannounced and without permission. The Board agreed unanimously, therefore, that the Cause of this Airprox was that, unaware of the promulgated glider site, the Spitfire pilot entered the Wittering ATZ without permission and flew into conflict with the ASK 21 glider.

Turning to the degree of Risk, it was fortunate that the Spitfire pilot had spotted the glider when he did; his break upwards and L achieved, in his view, a minimum separation of 200m horizontally and 30ft vertically. The glider pilot probably spotted the camouflaged Spitfire moments later. He reports seeing it commence a climb, whereupon he executed a full control movement to the R to avoid the Spitfire, which then passed ahead some 50m away. In the absence of consistent radar data on the glider it was not possible to assess independently the minimum separation that occurred. Whilst the robust nature of the avoiding action taken by both pilots had evidently averted a collision, this was a close miss, and the Board concluded unanimously that the safety of the ac had been compromised.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Unaware of the promulgated glider site, the Spitfire pilot entered the Wittering ATZ without permission and flew into conflict with the ASK 21 glider.

Degree of Risk: B.

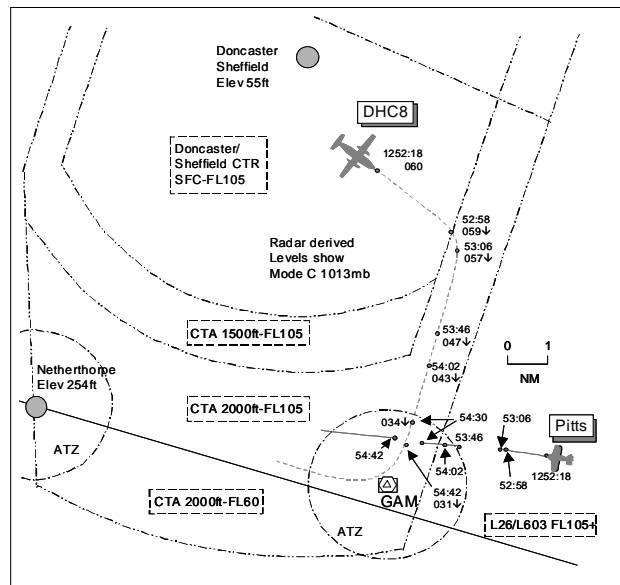
Safety Recommendations: (i) That the MoD reviews the glider site symbology and the representation of ATZs on military LFCs and within associated Mission Planning Aids with the aim of improving their conspicuity and clarity.

(ii) That the MoD reviews the co-ordination arrangements for UAA involving military ac, such as occurred here in regulated airspace, to ensure the safe de-confliction of UAA from other established but incompatible air activities.

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Date/Time: 21 Jun 1255 (Sunday)
Position: 5318N 00056W (10nm SSE Doncaster/
Sheffield - elev 55ft)
Airspace: CTA (Class: D)
Reporting Ac Reported Ac
Type: DHC8 Pitts S1S
Operator: CAT Civ Pte
Alt/FL: ↓3000ft 3500ft
(QNH 1024mb) (QFE)
Weather VMC CLBC VMC CLBC
Visibility: 10km 25nm
Reported Separation:
500ft V/<2nm H 4-500ft V/NR H
Recorded Separation:
c<0.2nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE DHC8 PILOT reports inbound to Doncaster/Sheffield IFR and in receipt of a RCS from Doncaster squawking 1242 with Modes S and C. On downwind heading 200° at 200kt, level at 3000ft, he thought, ATC advised them of unknown traffic 11 o'clock range 2nm. The traffic was sighted above them travelling W and identified as a Pitts type biplane, but no markings were identifiable. The Pitts passed <2nm in front and >500ft above with a small risk of collision. The approach was continued under Radar Control with the intruder visible at all times; no avoiding action was considered necessary.

THE PITTS S1S PILOT reports flying a local sortie from Netherthorpe, VFR and in communication with Netherthorpe on 123.275MHz; no transponder was fitted. He was flying 1000ft below cloud in VMC, visibility 25-30nm, in a green/yellow coloured ac; no lighting was mentioned. During an inadvertent incursion of Doncaster airspace he flew above the downwind leg of the Doncaster radar cct above an ac positioning for RW02. About 2nm N of Gamston heading 270° at 100kt, he thought at 3500ft Netherthorpe QFE but he had not noted his level or pressure setting at the time, he saw the reporting ac, a low-wing, he thought, twin engine type about 1nm away to his R before it passed safely behind and 400-500ft below. After landing he telephoned Doncaster to apologise and was told that the other ac's pilot had had visual contact with his ac and that there had been no problem. He assessed the risk as low. He was mortified to have been the perpetrator of bad airmanship. The flight was a simple handling exercise to maintain currency and should have been confined to uncontrolled airspace to the S of Netherthorpe. He carries a chart but owing to his familiarity with the area he does not normally look at it. He takes great care with the airspace immediately above and around Netherthorpe ordinarily but on this occasion he did not check the chart regarding the E extent of Doncaster's Zone (sic). His memory was faulty and on the final leg of the flight he took a return path very similar to ones ordinarily used over a number of years prior to the fairly recent establishment of the new ATC Zone (sic). He reported that this was an explanation not an excuse and he very much regretted that he could have put others and himself at risk. Following the incident he took the following action to prevent recurrence:- carrying out a very careful review of Doncaster airspace extent and limits, checking the chart prior to and during every flight and if near Doncaster airspace, monitoring the Radar frequency and/or establishing radio contact.

THE DONCASTER/SHEFFIELD APR reports the DHC8 was being vectored downwind RH for RW02 ILS approach. About 20nm from touchdown descending from FL60 to altitude 3000ft, APR passed TI on a primary contact in the DHC8's 11 o'clock, range 2nm just approaching the edge of CAS from the E. The DHC8 was also told that the target was heading W'bound and that it was believed to be remaining beneath the base of CAS; the DHC8 crew responded, "looking". The crew subsequently reported the traffic in sight and "we're about to pass through his level". By this stage the DHC8 was descending though altitude 4000ft and the crew reported that the unknown traffic looked like a Pitts Special but was unable to see any colouring or registration markings as the ac

was silhouetted against a bright sky. When the DHC8 was on R base for RW02 the crew were asked if they were still visual with the other ac to which they responded "affirmative". The DHC8 was then told to descend to 2500ft and to turn onto a closing heading to intercept the LLZ, provided the crew was content with their separation from the Pitts Special, still to the N of them. The crew advised that they were happy to accept the turn and they continued with the approach. The Pitts pilot later rang after landing at Netherthorpe, very apologetic, and said that he had been navigating from memory and had completely forgotten that the Doncaster CTA was there, only realising his error when he saw the DHC8 approaching from the N and descending through his level.

ATSI comments that the DHC8 was being vectored downwind RH for RW02 at Doncaster/Sheffield, by the Doncaster APR, who is situated at Liverpool. The ac was heading 200°, descending to 3000ft. At 1253:57, the controller advised the crew *"there's a primary contact in your eleven o'clock at two miles tracking westbound believed to be remaining beneath the C-er base of controlled airspace"*. The crew reported looking and shortly afterwards confirmed *"visual with that traffic...I think he's we're just about to descend through his level"*. At 1254:29 the crew of the DHC8 reported *"he's just over the top of us now looks like a Pitts Special"*. The radar recording, timed at 1254:30, shows the DHC8 at FL34 (3730ft QNH 1024mb), with an unknown primary return in its 1130, at a range of 0.5nm. At the time, the DHC8 is within the Doncaster/Sheffield CTA, where the base is 2000ft.

The controller had no reason to believe that the unknown ac was within CAS. Consequently, there are no ATC causal factors. Fortuitously, he passed TI to the DHC8 flight, to assist the crew in sighting the unknown ac.

UKAB Note (1): Using a combination of the Claxby and Clee Hill radar recordings the track of the Pitts is seen intermittently; however, the ac disappears at the CPA. At 1252:18 the DHC8 is seen 3.5nm SE of Doncaster/Sheffield tracking 130° level at FL60 whilst a primary only contact, believed to be the Pitts, is tracking 275° in the DHC8's 1 o'clock range 9nm. Forty seconds later the DHC8 is seen to commence a R turn and a descent as instructed by ATC to follow a RH pattern towards RW02. The Pitts fades after the radar sweep at 1253:06 as the DHC8 descends through FL57 5.5nm to its NNW. The Pitts reappears at 1253:46 2nm NE of GAM tracking 275° with the DHC8 steady tracking 195° and crossing the Pitts from R to L descending through FL47 (5030ft QNH 1024mb), range 3nm. When the APR passes TI on the Pitts to DHC8 crew at 1253:57 the radar shows the ac are separated by 2.2nm with the DHC8 passing FL43 (4630ft QNH). The Pitts fades again from radar after 1254:30 as the subject ac approach the CPA before reappearing at 1254:42, separation 0.3nm. Taking into account the speed of the ac prior to and post Airprox it is estimated the Pitts crossed <0.2nm ahead of the DHC8.

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 Pitts pilot for his honesty in 'putting his hands up' when he had made an error and for actions taken post incident to prevent a recurrence. Complacency had crept into the Pitts cockpit when the pilot flew his return leg to Netherthorpe without reference to his map. Having forgotten about the establishment of CAS, he had entered the Doncaster/Sheffield CTA without clearance and flown into conflict with the DHC8 and this had caused the Airprox.

Without any information to the contrary, (no RT call and only a primary radar return from the Pitts) the controller had no reason to believe that the radar return he could see heading towards the DHC8 was flying at a level that would penetrate the CTA; the unknown ac could have been flying below 2000ft, under the base level. However, the APR had passed TI on the unknown traffic approaching CAS to the DHC8 crew who subsequently saw the ac and informed the controller of its level. By now the Pitts had entered CAS whilst the DHC8 crew monitored its flightpath and continued their descent through its level. The Pitts pilot had visually acquired the DHC8 as it approached from his R before it passed behind and below. These visual sightings by both crews allowed the Board to conclude that any risk of collision had been effectively removed.

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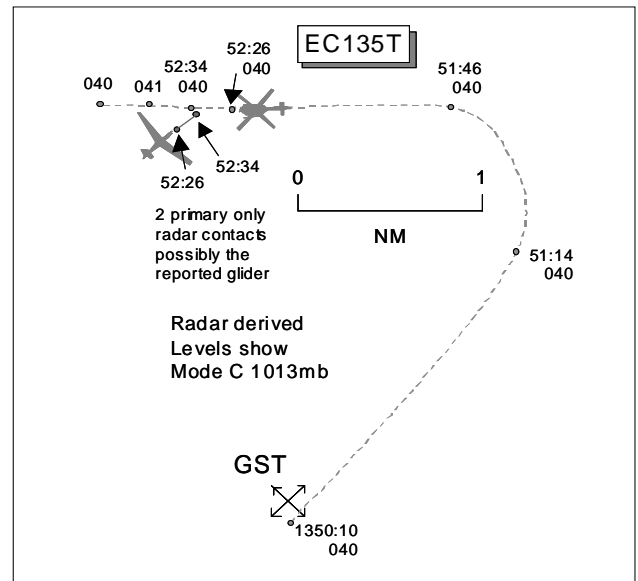
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Pitts pilot entered the Doncaster/Sheffield CTA without clearance and flew into conflict with the DHC8.

Degree of Risk: C.

AIRPROX REPORT NO 2009-061

Date/Time: 16 Jun 1353
Position: 5156N 00211W (2.5nm N Gloucestershire)
Airspace: FIR (Class: G)
Reporting Ac Reported Ac
Type: EC135T Untraced Glider
Operator: Civ Trg N/K
Alt/FL: FL40 (N/K)
Weather VMC CLBC N/K
Visibility: >10km
Reported Separation: Nil V/100m H
Recorded Separation: 0.1nm H

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

THE EC135T PILOT reports flying a local sortie from Gloucestershire IFR and in receipt of a PS from Gloucestershire squawking 7000 with Modes S and C. The visibility was >10km 200ft below cloud in VMC and the helicopter was coloured red with strobe lights switched on. The RHS pilot was undergoing an IRT behind screens and was outbound in the GST hold heading 275° at 100kt and FL40. He, the examiner was looking out of the LH window into sun and suddenly saw a high performance glider coloured white with red wingtips heading towards them about 200m away in a RH climbing turn, possibly taking avoiding action or possibly climbing in a thermal. An immediate warning was given over the intercom but ATC were talking at the time and the warning was not heard, so no action was taken. Minimum separation was assessed as nil vertically and 100m horizontally by comparing the ac size with another ac when back at their base. He assessed the risk as medium.

RAC MIL reports that despite extensive tracing action the identity of the reported glider remains unknown. An intermittent primary contact is seen for just 2 radar sweeps close to the EC135T during the encounter so procedural tracing was commenced. However, none of the glider sites contacted were able to offer information on any possible glider flights that may have been the reported ac.

ATSI reports that the EC135T flight established communication with 'Gloster' Approach at 1343, reporting inbound to the GST hold at FL40. The flight was provided with a PS and cleared to the GST at FL40. The pilot requested 1 complete hold and then to proceed outbound for an NDB approach to RW27. He reported entering the hold at 1350. Some 4min later, the pilot transmitted that he would like to report an Airprox, which had occurred about 2min earlier, with a glider, while he was in the hold. He elected to file the details after landing.

The MATS Part 1, Section 1, Paragraph 6, defines a Procedural Service: 'A Procedural Service is an ATS where, in addition to the provisions of a Basic Service, the controller provides vertical, lateral, longitudinal and time instructions, which if complied with, shall achieve deconfliction minima against other aircraft participating in the Procedural Service. A controller shall provide deconfliction instructions by allocating levels, radials, tracks, and time restrictions, or use pilot position reports, aimed at achieving a planned deconfliction minima from other aircraft to which the controller is providing a Procedural Service in Class F/G airspace'. On this occasion, the controller was unaware of the presence of the glider in the vicinity of the GST. Consequently, there were no apparent ATC causal factors.

UKAB Note (1): Met Office archive data show the Gloucestershire METAR as EGBJ 161350Z 22005KT 170V260 9999 SCT040 22/10 Q1023=

UKAB Note (2): The UK AIP promulgates the GST hold as a 1min LH racetrack, inbound QDM of 094°.

AIRPROX REPORT No 2009-061

UKAB Note (3): The Clee Hill radar recording at 1350:10 shows a 7000 squawk, believed to be the EC135T, O/H the GST NDB, located on Gloucestershire aerodrome, tracking NE entering the GST hold at FL40. Just over 1min later the ac is seen to commence a L turn, establishing on the outbound leg at 1351:46. Forty seconds later at 1352:26, a pop-up primary only contact appears, possibly the reported glider, in the EC135T's 11 o'clock range 0.3nm. The next radar sweep 8sec later shows the EC135T still maintaining FL40 tracking W with the glider in its 8 o'clock range 0.1nm. No further radar returns are received from the glider; however the next sweep shows the EC135T at FL41 Mode C before returning to FL40 and continuing in the GST hold.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the EC135T pilot, transcripts of the relevant RT frequencies, radar video recordings and reports from the appropriate ATC authorities.

Although the EC135T flight was flying IFR within the published holding area for the GST NDB, it is not unusual to encounter gliders anywhere in Class G airspace flying up to the cloudbase. A GA Member noted that the EC135T's holding level was just below the cloudbase and the examiner, seated on the LHS and responsible for lookout, was looking into sun when the Airprox occurred. The EC135T pilot and the glider pilot were equally responsible for maintaining separation from other traffic through 'see and avoid'. Although the turn executed by the glider and seen by the EC135T examiner may have been pure co-incidence or another turn during thermalling, it could have been an avoidance turn. The same Member said that, from the geometry of the encounter, he would have expected the glider pilot to have seen the EC135T and to have filed a report if it had passed close-by. Since the glider had not been traced, Members could only surmise that it was a possible non-sighting by the glider pilot and a late sighting by the EC135T IR examiner that had caused the Airprox.

Turning to risk, it was difficult to be definitive in the absence of any statement from the glider pilot. However, the EC135T examiner saw the glider 200m away as it was already turning and climbing, estimating it passed 100m clear at the same level. This manoeuvre, for whatever reason, had already begun to resolve the potential conflict. Although this had been a late sighting, Members agreed that the EC135T pilot was always in a position to adjust his ac's flight path if necessary whilst he watched the glider manoeuvre clear to his L. On balance, the Board concluded that the risk of collision had been effectively removed.

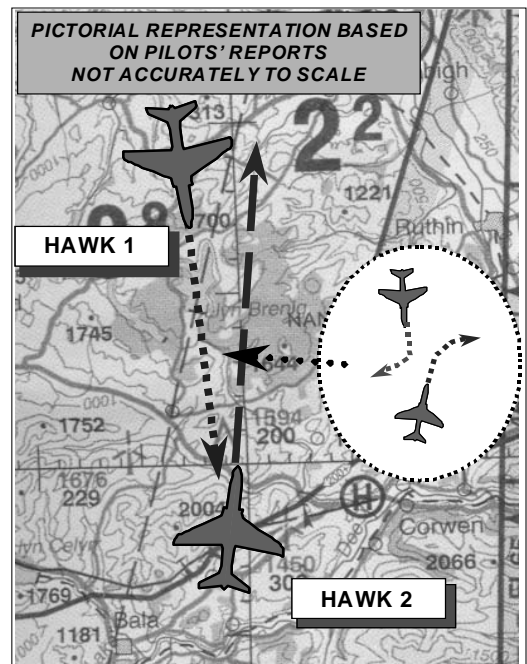
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Possible non-sighting by the glider pilot and a late sighting by the EC135T IR examiner.

Degree of Risk: C.

AIRPROX REPORT NO 2009-062

Date/Time: 24 June 1039
Position: 5304N 00332W (13nm S of Rhyl)
Airspace: UKDLFS (Class: G)
Reporting Ac Reporting Ac
Type: Hawk T1 Hawk T1
Operator: HQ AIR (Trg) HQ AIR (Trg)
Alt/FL: 250ft 250ft
(RPS 1019mb) (N/K)
Weather VMC (CAVOK) VMC
Visibility: 50km
Reported Separation:
0ft V/300m H 0V/NRH(300mon
pilot's diagram)
Recorded Separation:
NR

**BOTH PILOTS FILED****PART A: SUMMARY OF INFORMATION REPORTED TO UKAB**

THE HAWK PILOT (HAWK 1) reports flying a black ac with strobes switched on but no TCAS fitted on a routine low-level navigation training sortie in LFA7 at 420kt and 250ft MSD and heading 176°, with a student flying the ac from the front seat. They had just entered low-level at Llyn Brenig when the front seat pilot saw another ac, approaching in the front quarter and immediately called a break to the right; at the same time the captain in the rear seat spotted the ac [nose light] 1500ft away at the same height in their 11 o'clock coming straight towards them so he took control and initiated avoiding action by pulling up and rolling to the right. After rolling out, the other ac was visually confirmed as another Hawk and was assessed to have passed within 1000ft of them. The G meters were checked, both indicating an overstress so the sortie was terminated. A PAN was declared to Valley Approach and the ac recovered without further incident. He assessed the risk as being very high and the incident was reported to the SFSO on landing.

THE HAWK PILOT (HAWK 2) reports flying a black ac with strobes switched on but no TCAS fitted on a routine low-level navigation training sortie in LFA7 at 420kt and 250ft MSD and heading 005° with another pilot in the rear seat. They were halfway down an IP to target run in a medium workload situation, when both front and rear seat pilots saw a another black Hawk 1000ft away in their left 11 o'clock just as it had initiated a break turn to avoid them. It was co-alt and on what, with the benefit of hindsight, was very close to, if not actually, a collision course prior to the break. Shortly after the other ac had initiated its break [to the right], the front-seat handling pilot also broke to the right, passing 1000ft down its left-hand side. All bookings were made in accordance with LL regulations and local de-confliction procedures were all followed. The incident was reported to Valley APP on first contact and he assessed the risk as being High.

UKAB Note (1): Although both ac paint intermittently the Cleve Hill radar recording before and after, the CPA of the actual incident was not recorded.

THE HAWK UNIT SFSO commented that ground-based manual systems are used at RAF Valley to try to ensure deconfliction between local flights. TCAS is not currently fitted to the Hawk T1 but, when the future of the ac [T1] is known it will be considered.

AIRPROX REPORT No 2009-062

HQ AIR (TRG) comments this is another close encounter in the UKDLFS between 2 Hawk ac from the same unit. There are local deconfliction procedures in place but the effectiveness of these can be reduced with late changes to sortie timings; visual detection remains the primary method of detecting other low flying ac. The Hawk Mk2 is fitted with TCAS and work is continuing on the feasibility/practicalities of fitting it to the current Hawk Mk1 fleet.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac and a report from the Hawk operating authority.

Members noted that both ac had been operating legitimately at 250ft in LFA7. A Member unfamiliar with the local deconfliction procedures questioned why, despite deconfliction procedures, the ac had come into such close proximity. The DARS and Low Flying Advisors explained the manual procedures used and how, despite the best efforts of the crews and the Station, route changes or timing alterations can render them ineffective. They also briefed the Board that some current (not available at RAF Valley) and most future Mission Planning Systems will have limited deconfliction functionality. It was also pointed out that ACAS/TCAS operates on the 'line of sight' principle and in these particular circumstances might not have provided any earlier warning of the conflict. It appeared to Members that the respective crews had seen the opposing ac almost as early as the terrain had allowed; Hawk 2 appeared from over a ridge, just over 5nm distant, on a track directly opposing Hawk 1 in a valley with a combined closing speed of 840kt (1nm per 4¼nm/sec). This gave the pilots a theoretical maximum time of just over 20sec to acquire, assimilate the flightpath and react appropriately to the other ac; this they did. Although one of the pilots had overstressed his ac by a small margin, an experienced Hawk pilot explained that this was a relatively minor excursion within the overall ac G limitation.

Following these explanations, Members agreed that this incident was **not** the result of any late sightings and the undulating terrain had been a major factor. Although the effective manoeuvres conducted by both pilots removed any risk that the ac would have collided, the relative lateness of the manoeuvres and resultant proximity of the ac persuaded Members that safety had not been assured.

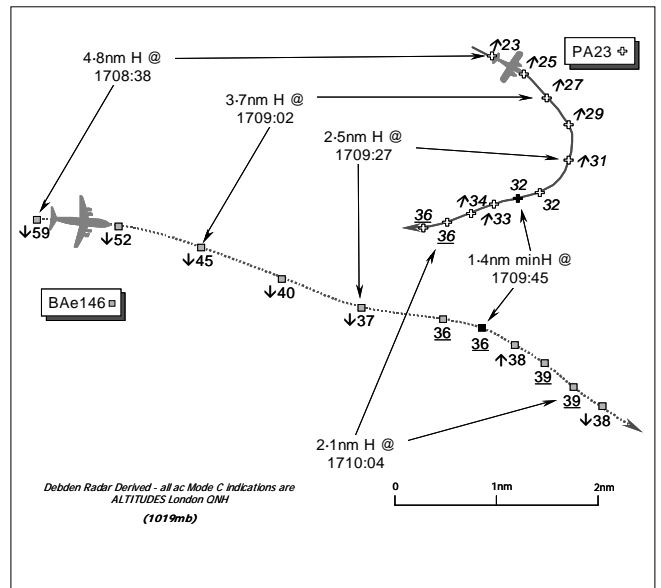
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in the UK DLFS resolved by both Hawk crews.

Degree of Risk: B.

AIRPROX REPORT NO 2009-063

Date/Time: 24 Jun 1709
Position: 5210N 00049W (9nm NWbW of Cranfield - elev: 358ft)
Airspace: London FIR (Class: G)
Reporting Ac Reported Ac
Type: BAe146-301 Piper PA23
Operator: Civ Comm Civ Pvt
Alt/FL: ↓3500ft 2000-3000ft
 QNH (1019mb) QNH (1019mb)
Weather VMC CLBC VMC CLBC
Visibility: 40km 10km
Reported Separation:
 400ft V/0.4nm H NR
Recorded Separation:
 400ft V/1.4nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BAe146-301 PILOT reports that he was inbound to Cranfield under IFR in VMC. Both TCAS and Mode S are fitted. Previously, whilst under a RCS from LONDON CONTROL descending in the vicinity of DAVENTRY, they had been advised that they had been cleared by Cranfield to descend to 3500ft on 1019mb, call Cranfield on 122.85MHz and squawk, he thought, A7000. Just after checking in with Cranfield APPROACH (APP), although not in receipt of an ATS, at a position about 290° Cranfield 14nm heading 110° at 250kt whilst levelling off at 3500ft Cranfield QNH, a TCAS contact suddenly appeared on their display. TCAS enunciated a TA, immediately followed by a CLIMB RA, which was complied with. The other ac was not seen visually, but was displayed on TCAS some 400ft below his ac at the closest point as it passed down their port side, he estimated about 0.4nm away. A few seconds later TCAS enunciated CLEAR OF CONFLICT.

Assessing the Risk as “medium”, he added that APP was very busy and it was difficult to “break-in” on the RT. He waited for a gap in transmissions by which time CLEAR OF CONFLICT had been enunciated by TCAS and so they returned to their assigned altitude. His ac has a predominantly white colour scheme with a blue fin.

THE PIPER PA23 PILOT, reports he was operating on a local flight from Cranfield in VMC whilst conducting general handling under VFR between 2000-3000ft Cranfield QNH (1019mb). He was under a BASIC Service from Cranfield APP on 122.85MHz. A squawk of A7000 was selected with Modes C & S on. TCAS is not fitted.

Flying at 90-130kt some 500ft below cloud, with an in-flight visibility of 10km, the BAe146 was not seen and assumed to be flying above cloud. He presumed that the BAe146 was self-positioning for a L Base LEG to RW03 at Cranfield. His ac is coloured white with a multicoloured fin; HISLs were on.

ATSI reports that the Airprox, which occurred outside CAS, involved the BAe146 inbound to Cranfield on an IFR flight and a PA23 on a local VFR detail. The weather was CAVOK. Cranfield is not a radar-equipped airport.

The PA23 pilot was cleared for take off at 1653 with a “left turn VFR...”. The BAe146 crew established communication with Cranfield APP at 1658, passed an estimate for the CIT of 1715 and requested the weather. The pilot was informed to expect 3500ft for RW03 and the weather was passed. He said he would call back when the flight was released. This occurred at 1708, when the pilot of the BAe146 reported to APP passing 5000ft for 3500ft, released by London. The clearance to the CIT at 3500ft QNH was confirmed by APP at 1709:00. The pilot then requested a Visual approach to RW03. The controller asked him, “are you happy to report on left base for runway 0-3 from your current position”. This was agreed and the pilot was requested to “report on left base for runway 0-3 Visual approach runway 0-3 you are number 1”. Just before 1710, the BAe146 pilot reported his range from Cranfield as approximately 9nm and shortly afterwards was instructed to “position yourself for a 4 mile final

AIRPROX REPORT No 2009-063

to runway 0-3, you'll be number 2 number 1 is a One Fifty on right base at the moment in the circuit". Information about over-flying traffic was issued to the BAe146 crew as the flight was becoming Number 1 to land. The pilot reported turning base at 4nm at 1713 and was cleared to land.

Neither pilots involved made any comment, on the frequency, about the close proximity of any other ac. The next call from the PA23 occurred at 1729, when the pilot requested to rejoin from the direction of WOBUN.

There are no apparent ATC causal factors within this Airprox. The BAe146 pilot reported receiving and reacting to a TCAS RA after "checking in" with Cranfield APP. The controller, not being provided with radar, would not have known its position relative to the PA23 at the time. The PA23 was in receipt of a BASIC Service, although the type of ATS had not been agreed on the frequency and its current operating area was not known by the controller.

UKAB Note (1): The Debden Radar recording illustrates this Airprox relatively clearly. The BAe146 is shown approaching the Airprox location from the W, identified from its LTCC squawk before switching to A0247 – an unvalidated & unverified Cranfield IFR conspicuity squawk. On course for Cranfield, the BAe146 descends through 5800ft London QNH (1019mb) at 1708:38, when it is at a range of 4-8nm from the PA23 – shown squawking A7000 – as the twin climbs through 2300ft London QNH unverified Mode C on a SE'ly track. Whilst the two ac close, the PA23 commences a R turn and, at a range of 2-5nm, is shown climbing through 3100ft QNH – some 600ft below the BAe146 that is descending through 3700ft QNH on a steady course. As the PA23 takes up a generally WSW'ly course it levels at 3200ft QNH unverified Mode C for two sweeps, some 400ft below the BAe146 that has levelled at an indicated 3600ft QNH unverified Mode C; this coincides with the CPA of 1.4nm at 1709:45 as the PA23 draws abeam on the port side. On the next sweep the BAe146 pilot's response to the reported TCAS CLIMB RA is evident as his ac climbs through 3800ft QNH with the separation increasing. The BAe146 then ascends fleetingly to a maximum indicated altitude of 3900ft some 300ft above the PA23 indicating 3600ft QNH, which is now 2.1nm astern. The BAe146 then descends once more.

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 and report from the appropriate ATC authority.

One CAT pilot Member wondered if the BAe146 crew perceived there were no other conflicting ac below them when instructed to descend to 3500ft Cranfield QNH. The ATSI advisor explained that the BAe146 crew would have received a 'clearance' from London CONTROL to exit the relative sanctuary of CAS by descent into the 'see & avoid' environment of Class G airspace. Whereas the crew might have supposed that the 'clearance' they received might have taken into account the PA23, this was clearly not the case here, their assigned altitude of 3500ft QNH being allocated by Cranfield APP for their IFR arrival via the CIT, before they elected to execute a visual approach in the prevailing CAVOK conditions. Members recognised that outside the Cranfield ATZ, in the absence of any radar service or any overarching CAS, Cranfield APP would have been unable to provide any separation or traffic information against other VFR flights operating in the FIR; this included the PA23, which was in receipt of a BASIC ATS. It was stressed that Cranfield is not equipped with surveillance radar, therefore this is a non-radar procedural environment and, although APP had not stated on RT the ATS being afforded to the BAe146 crew as he should have done, the controller was in effect providing a procedural service based on known IFR traffic in communication with Cranfield. The only form of de-confliction minima afforded here would have been against other flights also participating in the procedural service from APP. Plainly without the benefit of radar, APP would not have known where the VFR PA23 flight was operating and therefore could not have offered any specific assistance to avert this encounter in the 'see & avoid' environment of Class G airspace.

Whilst it might not be the case here, the Board discussed common misconceptions amongst pilots about the revised ATSS outside CAS. Moreover pilots should clarify the type of ATS being afforded when operating outside CAS. Controller Members observed that it was essential that controllers should state clearly the ATS being provided to flights operating outside CAS to avoid any confusion over this very important issue. Indeed the ATS agreed should be read-back by pilots when the 'contract' is established at the outset. Generally, this will not be the case to flights in CAS where a RCS is provided. Furthermore, it should be noted that even when an ATSU equipped with radar is providing a BASIC ATS, there is no compunction on the controller to identify the ac, maintain track identity or monitor the flight.

From his perspective, the PA23 pilot was legitimately conducting his general handling in the 'Open FIR' under VFR and did not see the BAe146 during this encounter between VFR and IFR flights in Class G airspace. Clearly, the PA23 pilot would have been unable to sight the larger airliner approaching from the W until he turned SW'ly towards it, but it was surprising to some that the airliner remained unseen as it passed 1.4nm to port at the CPA; this was somewhat more than the 0.4nm minimum horizontal separation perceived by the reporting pilot, but to a pilot operating under VFR such separation might not seem inappropriately close. In the other cockpit with the benefit of TCAS to assist them, the BAe146 pilots were forewarned of the presence of the PA23 following the TA, and were thus primed to react promptly to the RA when it was enunciated. Whilst TCAS works exceptionally well in the vertical plane – as it is designed to do – the azimuth information on pilots' displays is somewhat limited and this encounter illustrates the inherent difficulty for pilots in assessing ranges accurately from such TCAS equipments. Nevertheless, the radar recording reflected that the BAe146 crew had complied with the fleeting CLIMB RA; it was evident that the BAe146 was levelled at 3600ft - some 400ft above the PA23 at the CPA – before it then entered a short climb to 3900ft and the PA23 drew astern. As the range increased, TCAS enunciated CLEAR OF CONFLICT, thereby enabling the BAe146's crew to return to their assigned altitude. Neither pilot in the BAe146 saw the PA23 out to port even though they were aware of it from their TCAS display; whilst the reporting pilot might have been concerned at the proximity of the other ac estimated from his TCAS display, the recorded radar data evinced that the minimum separation was somewhat greater. It seemed plain that it was the turn about of the PA23, as its nose swept through the 'protected' bubble surveyed by TCAS ahead of the BAe146, coupled with the twin's climb toward the BAe146, which had triggered the RA because TCAS perceived the vertical buffer between them would be breached at close range. Whilst the Board could only base their assessment on what actually happened rather than what might have occurred if circumstances had been slightly different, it was evident to the Members from the available radar data that these two ac were not going to get any closer than they did. The Members agreed unanimously therefore, that this Airprox had stemmed from the BAe146 crew's detection of the PA23 on their TCAS, in effect a Sighting Report (TCAS), and at these distances no Risk of a collision had existed in the circumstances conscientiously reported here.

PART C: ASSESSMENT OF CAUSE AND RISK

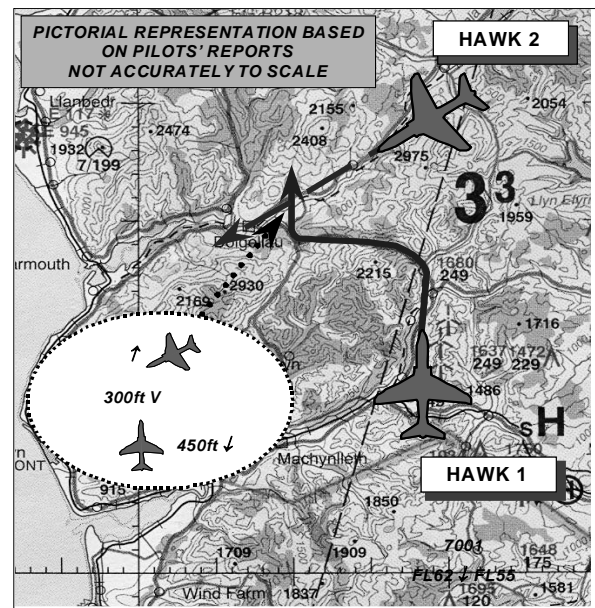
Cause: Sighting Report (TCAS).

Degree of Risk: C.

AIRPROX REPORT No 2009-064

AIRPROX REPORT NO 2009-064

Date/Time: 25 June 0950
Position: 5244N 00350W (5nm West of Dolgellau)
Airspace: UKDLFS (Class: G)
Reporting Ac Reporting Ac
Type: Hawk T Mk1 Hawk T Mk1
Operator: HQ Air (Trg) HQ Air (Trg)
Alt/FL: 450ft agl 250ft agl
(RPS 1009mb) (RPS 1011mb)
Weather VMC CLBC VMC CAVOK
Visibility: >10km 15km
Reported Separation:
300ft V/150m H 300ft V/ 0 H
Recorded Separation:
NR



BOTH PILOTS FILED

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE HAWK T1 PILOT (HAWK 1) reports flying dual on a Low Level training flight at 250ft MSD in LFA7. His was flying a black ac with nose light and HISLs selected on, squawking 7001 with Mode C and listening out on the Low Level Common frequency. TCAS was not fitted.

On exiting the north of the 'Machynlleth Loop' at 420kt they turned N and remained slightly high to cross the valley that heads SW from Lake Bala. The rear seat pilot saw another black Hawk ac, with different Sqn's markings, 500ft away, slightly above, climbing and crossing right to left on a heading of 220°. He immediately called the conflict and the front seat [handling] pilot initiated a 0.5G bunt as he gained tally on the other ac. The conflicting ac passed above and in front of them. He reported the incident on landing, assessing the risk as being Medium.

THE HAWK T1 PILOT (HAWK 2) reports that at the time of the incident he was flying dual, leading a pair of ac on a Low Level training flight at 250ft MSD and 420kt in LFA7. He was flying a black ac with nose light, HISLs selected on and squawking 7001 with Mode C and operating on a tactical frequency. TCAS was not fitted.

During the planning cycle for the sortie, it was noted that an ac from another Sqn would be conducting 'free-nav' in a large box from S of Aberystwyth to N the Machynlleth loop and approx 20nm wide, during their planned airborne time.

The Airprox occurred during a period of medium workload conducting a simulated attack on a ground target. While passing the exit to the 'Machynlleth Loop' his wingman called a conflict as, "Hawk left-right...", at which point he saw the ac about 1000ft away in their 11 o'clock. At the time of sighting it was level with them on a collision course so he immediately initiated a climb and passed 300ft over the top of it.

He assessed the risk as being medium and reported the incident to Valley ATC on first contact with them.

UKAB Note (1): The incident occurred below the base of recorded radar cover.

UKAB Note (2): The UK Military Low Flying Handbook gives the position of the Machynlleth Loop and states that:

'The Valleys known as the Machynlleth Loop are to be flown in an anticlockwise direction only. This restriction applies only to ac flying in the valleys.'

In this case the Hawk had been flying in an anticlockwise direction and had just turned right onto N to exit the loop.

THE HAWK STATION commented that basic routing data in the LFS is passed between the Sqns at RAF Valley and this resulted in the crew of Hawk 2 being aware, before the flight, that at least one other ac was engaged in 'free nav' in their vicinity. The station is continuing to develop their internal deconfliction procedures with the aim of informing crews of their ac operating in LFA7 of the up-to-date timings of other ac so that deconfliction can be carried out with a greater accuracy. However, ac from many other units also use the LFA7 and good lookout is paramount.

HQ AIR (TRG) comments that both crews saw each other's ac in time to execute controlled avoiding action. Since low flying is practised to avoid detection by radar and other ac, early detection of conflicts can be difficult. Prior knowledge of other low-level movements in any particular area helps SA but late notice changes to routes and timings can render pre-flight identification of conflict points ineffective.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from the pilots of both ac and the Hawk operating authority.

The Board noted that both ac were operating legitimately in LFA7 at 420kt and 250ft MSD under the see and avoid principle. Further, although Hawk 1 had been complying with the mandatory flow system round the 'Machynlleth Loop' he had just left the area of the loop on a Northerly track and was crossing a valley just to the N. Although not reported by the pilot of Hawk 1, the crew should have been aware from the local procedures employed at RAF Valley, that Hawk 2 was also operating in the same general area; the crew of Hawk 2 reported that they **were** aware that Hawk 1 was in the LFA but, since it was conducting 'free nav', they were not aware of its exact routing and therefore its position at any particular time.

Members noted that screening by the mountainous terrain had necessarily meant that the respective sightings of the conflicting ac had been later than optimum. They also observed that in both cases it was not the handling pilot who had first seen the opposing ac; in Hawk 1 it was the rear seat pilot and in Hawk 2 it was the wingman. This had, albeit marginally, delayed the onset of the respective avoidance manoeuvres; however, as a result of timely and effective communication, both handling pilots saw the opposing ac in time to react and conducted measured and effective avoidance manoeuvres, thus removing any risk of a collision.

PART C: ASSESSMENT OF CAUSE AND RISK

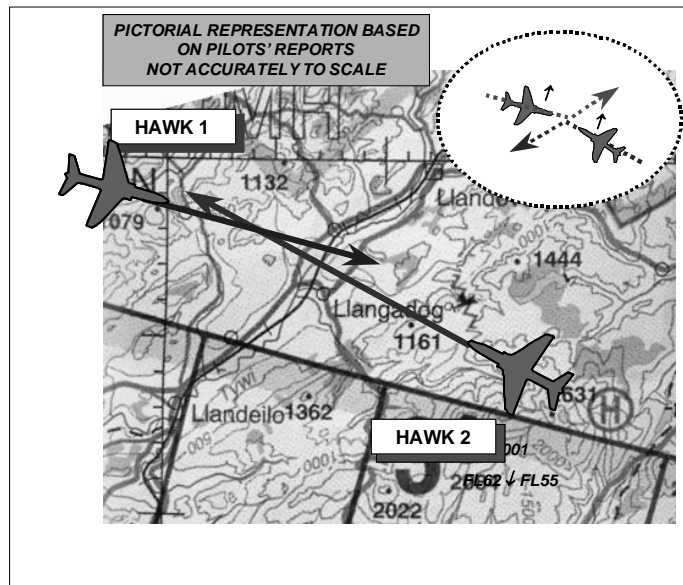
Cause: A conflict in the DLFS.

Degree of Risk: C.

AIRPROX REPORT No 2009-065

AIRPROX REPORT NO 2009-065

Date/Time: 18 June 1414
Position: 5157N 00353W (8nm W of Sennybridge)
Airspace: UKDLFS (Class: G)
Reporting Ac Reporting Ac
Type: Hawk T Mk1 Hawk T Mk1
Operator: HQ AIR (TRG) HQ AIR (TRG)
Alt/FL: 250ft agl 250ft agl
(RPS 1008mb) (RPS 1008mb)
Weather VMC VMC
Visibility: >10km >10km
Reported Separation:
0ft V/50m H 0ft V/50ft H
Recorded Separation:
NR



BOTH PILOTS FILED

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE HAWK T MK1 PILOT (HAWK 1) reports they were conducting a low level staff continuation training sortie at 250ft MSD in LFA7, flying a black ac with HISL and nose light switched on, squawking 7001 with Mode C, with the captain in the front seat and a passenger in the rear seat. At 1414 a nose light of another ac, identified as another Hawk, was seen 400m away in their one o'clock position, coming towards them. There was a very high collision risk and an emergency break upwards and left at 7.5G was initiated. The other Hawk was not seen to take any avoiding action, but Hawk 1's crew did not visually reacquire it after their emergency break. After the Airprox a radio transmission was made on the UK low level common frequency to declare the Airprox and identify the callsign of the other ac; Hawk 2 responded and the crews agreed to discuss the incident further upon landing.

During the post landing discussion the other pilot agreed the details of the event except that he estimated minimum separation as being 50ft as opposed to 50m; he confirmed that he had also initiated an emergency break in excess of 8g climbing to the left; also did not see any avoiding action. It was therefore mutually assumed that both ac had taken avoiding action at the exactly the same time, passing close, belly up and blind to each other.

THE HAWK T MK1 PILOT (HAWK 2) reports they were conducting a low level training sortie at 250ft MSD in LFA7, flying a black ac with HISL and nose light switched on, squawking 7001 with Mode C, with the captain in the back seat and a student in the front seat. At 1414 a nose light of another ac was spotted in the 11 o'clock position. There was a very high collision risk and an emergency break (8.9 G) up and to the left was initiated. Hawk 2's crew did not see Hawk 1 take any avoiding action but it was not visually reacquired after their emergency break. During the post landing discussion the other pilot agreed the details of the incident except the minimum separation that he estimated the horizontal miss-distance as being 50m rather than 50ft.

UKAB Note (1): The terrain in the vicinity of the incident is a shallow valley running NE/SW. The valley is about 1nm wide with the hills on either side rising to 1000ft above the valley floor, which is about 150ft amsl. Both ac were crossing the valley in opposite directions at about 90° to its axis

HQ AIR (TRG) comments that having their ac nose light on helped both crews to sight each other's ac, albeit late, with sufficient time to take avoiding action. Work is continuing at the RAF Valley to improve the deconfliction procedures between their ac operating in the LFS.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from the pilots of both ac and a report from the Hawk operating authority.

The Board noted that both ac were operating legitimately in LFA7 at 420kt and 250ft MSD under the see and avoid principle. Although not confirmed by either pilot, since both ac were from the same Sqn and assuming they had complied with the local flight notification procedures employed at RAF Valley, both pilots should have been aware of the presence of the other ac in their area of operation; however if either ac had suffered a delayed take off, although they would have been aware of their respective routeings, they would not have known accurately the position of the other ac at any particular time.

Members noted that due to screening by the rolling terrain and since both ac would most likely have been below the horizon when viewed from the opposing cockpit, the respective sightings of the conflicting ac had been later than optimum and resulted in severe avoidance manoeuvres; however, theoretically both ac should have been visible to each other for over 4nm (17 sec). One military Member commented that in this almost head-on scenario, as reported by both pilots, the utility of the Hawk's headlight had again been significant. Although the Board agreed that the cause of the Airprox was the very late sightings by both pilots, it was divided over the risk assessment. A majority of Members were persuaded that, although the handling pilots had needed to use aggressive avoiding manoeuvres and normal safety standards had been eroded, the risk of collision had been removed.

PART C: ASSESSMENT OF CAUSE AND RISK

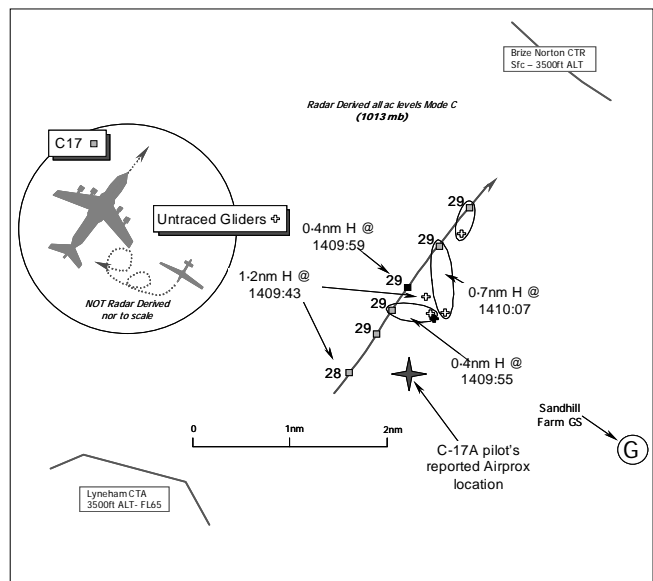
Cause: Very late sightings by both pilots.

Degree of Risk: B.

AIRPROX REPORT No 2009-066

AIRPROX REPORT NO 2009-066

Date/Time: 16 June 1410
Position: 5138N 00144W (10nm SW of Brize Norton)
Airspace: London FIR (Class: G)
Reporting Ac Reported Ac
Type: C-17A Untraced Glider
Operator: HQ Air (Ops) NK
Alt/FL: 3000ft NK
QFE (1013mb)
Weather VMC VMC
Visibility: 35km NR
Reported Separation:
100-200ft V/<¼nm HNR
Recorded Separation:
Not recorded



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BOEING C-17A GLOBEMASTER III pilot reports that he was in transit under VFR from Lyneham to Brize Norton at 3000ft Brize QFE (1013mb) following Operational Tasking. The flight was routed over Swindon at 3000ft in VMC some 1000ft clear below cloud with an in-flight visibility of 35km direct to the BZN TACAN thereby avoiding the Fairford overhead and Shrivenham [Sandhill Farm] gliding site. Prior to departure, Lyneham briefed him of about possible glider traffic en-route to Brize Norton. Once in 2-way RT contact with Brize APPROACH and receiving a TRAFFIC Service, they were again briefed by the controller on contacts that were possibly gliders on his route. The area ahead of his C-17A appeared clear of other aircraft visually and there were no conflicting TCAS contacts on his planned route. Manoeuvring to the R would have taken his ac towards Shrivenham [Sandhill Farm] Glider Site - where he suspected the glider contacts to be - whereas flying to the left of track would have placed the C-17A over the Fairford ATZ and towards some contacts observed on his TCAS display, albeit at a distance.

Whilst he continued to focus his lookout forward, his co-pilot was carrying out the approach checks, which distracted the latter from his lookout. There were 2 passengers seated in the 2 auxiliary crewman's (ACM) seats on the flight deck and one of the air load masters was stood on the flight deck providing additional lookout. The passenger in the right ACM seat (who has some experience of gliding) reported seeing 2 white gliders in their 0130 to 2 o'clock position about 100-200ft above his ac, which then passed down the starboard side of his ac less than ¼nm away. The co-pilot then reported seeing them in their 4 o'clock - behind the right wing. Neither glider was manoeuvring aggressively and they appeared to be banking gently, possibly in a thermal. The gliders did not appear to have taken avoiding action and the gliders were seen too late for the C-17A to take any avoiding action.

Following a brief discussion with the passenger seated in the right ACM seat to assess his competence to judge a potential Airprox situation and, believing his passenger to have had relevant experience and his assessment to be valid, he elected to report the Airprox once they were on the ground, as by then he was about to enter the Brize Norton visual cct. He reported the Airprox to Brize GROUND 5min after landing

He stressed his concern that gliders were operating close to several major military airfields without 2-way RT contact nor squawking. As the gliders were white and did not appear to have strobes/HISLS, they were almost invisible against the bright white background of the white Cu cloudscape. He assessed the Risk as "very high". Whilst in transit his workload was described as moderate.

His ac has a grey camouflage scheme but the HISLs and landing lights were on. A squawk of A3741 was selected with Mode C; both TCAS & Mode S are fitted.

UKAB Note (1): The C-17A pilot reported the Airprox occurred at 1410:00, in a position about 220° BZN 10nm but despite extensive tracing action the identity of the reported glider remains unknown. The pilot of a Schempp-Hirth Discus glider operating in the area of the reported Airprox location helpfully provided a report but from his IGC logger trace and other data provided from his flight it seems he was over 2nm SE of Sandhill Farm Glider Site at the time of the Airprox, which occurred about 3nm NW of Sandhill Farm. The Schempp-Hirth Discus pilot did not see the C-17A and he stressed that the area was used by several other gliders at the time, with at least one sharing the same thermal he used. Unfortunately therefore, the reported glider remains untraced.

THE BRIZE NORTON APPROACH CONTROLLER reports that he had been controlling on console for about 1hr 10min. The traffic situation was “light” in VFR conditions with APPROACH, DIRECTOR and ZONE ‘bandboxed’. Other traffic under service included 1 ac on a MALBY departure on 127.250MHz and 1 glider on 119.0MHz outside the CTR around the South Cerney area [not the reported glider]. The C-17A was handed over from Lyneham in receipt of a TRAFFIC Service inbound from Lyneham to Brize at 3000ft QFE (1013mb) for a visual approach. Traffic information was called to the C-17A crew on contacts that were believed to be 2 gliders. The C-17A crew did not mention anything about an Airprox on RT and once they reported visual with Brize Norton they were switched to the TOWER frequency. Upon landing, the C-17A pilot informed the TOWER controller that he had seen gliders; he informed him later that afternoon that he would be filing an Airprox report with respect to the gliders.

UKAB Note (2): The Heathrow Radar recording shows the C-17A, identified from its Mode S assigned ac i/d, in transit between Lyneham and Brize Norton at 2900ft Mode C (1013mb) which is also its height based on the Brize QFE of 1013mb. Several primary contacts are displayed intermittently in the vicinity, which might or might not be the glider described in the C-17A pilot’s report, but none can be positively identified. The C-17A passes 1nm N of the reported Airprox location at the time the Airprox occurred when an intermittent primary contact that might well be the reported glider is shown passing 0.4nm to starboard.

DAATM reports that shortly after departing Lyneham on a VFR flight to Brize Norton, the C-17A was handed over to Brize Norton APPROACH on 133.75MHz level at 3000ft Brize Norton QFE (1013mb) under a Traffic Service.

Traffic levels were reported as light and APPROACH, DIRECTOR and ZONE were band-boxed onto one control position. The C-17A crew made initial contact with Brize Norton APPROACH on 133.75MHz at 1409:01, “*Brize, Good Afternoon [C-17A C/S] is..3000 feet inbound with 9 persons on board, November copied..request downwind join*”. Responding the Controller advised, “*.. Brize APPROACH..good afternoon identified 3000 feet Brize QFE 1-0-1-3 TRAFFIC Service own navigation*”, which the crew acknowledged. At 1409:29, APPROACH passed traffic information to the C-17A crew, “*..intermittent contact 12 o’clock 3 miles manoeuvring possibly 2 gliders*”. Further traffic information was passed on an ac departing from Brize Norton and the C-17A crew was given standard joining instructions for a LH downwind visual join to RW26. The pilot called visual with the airfield and was transferred to TOWER at 1410:32, “*descending now to TOWER 123.725 MHz [C/S]*”. The controller reported that he was working one glider on 119.0MHz in the vicinity of South Cerney [not the reported gliders]; the glider pilot was receiving a BASIC Service and the glider was not identified on radar. The recording of the Heathrow Radar does show several primary-only returns in Class G airspace that merge and pass down the C-17A’s starboard side. The C-17A pilot reported that Lyneham had also briefed the crew prior to departure of glider activity in the vicinity.

The controller provided a TRAFFIC Service passing accurate traffic information on the intermittent primary returns in accordance with CAP774 Chap 3 Para 1.

A TRAFFIC Service is defined as:

... a surveillance based ATS, where in addition to the provisions of a Basic Service, the controller provides specific surveillance derived traffic information to assist the pilot in avoiding other traffic. Controllers may provide headings and/or levels for the purposes of positioning and/or sequencing; however, the controller is not required to achieve Deconfliction minima, and the avoidance of other traffic is ultimately the pilot’s responsibility.

THE BOEING C-17A GLOBEMASTER III PILOT’S UNIT comments that this incident highlights the number of glider sites around the Brize Norton CTR. Gliders can be difficult to acquire visually, and they are not always seen on radar so it is not always possible for ATC to warn pilots of their presence. Again it highlights the importance of a good lookout and the need to avoid glider sites by the greatest possible margin. A reminder has been sent out to all aircrew at Brize Norton detailing the potential risk from glider sites.

AIRPROX REPORT No 2009-066

HQ AIR (OPS) comments that the C-17A crew appear to have been doing as much as possible to ensure a safe transit between Lyneham and Brize Norton. However, as the Station comments, gliders are notoriously difficult to see. In this case, with the relevant gliders not identified, it is difficult to say more.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included report solely from the pilot of the C-17A, a transcript of the relevant RT frequency, radar video recordings, a report from the air traffic controller involved and reports from the appropriate ATC and operating authorities.

It was unfortunate that it had not been possible to identify the reported gliders. Consequently, the assessment of this Airprox could only be based on the reporting pilot's account, limiting the Board's ability to come to any meaningful conclusions. Moreover, the data provided by the radar recording was also inconclusive, as it did not give a continuous illustration of the geometry of this encounter; therefore, the minimum separation could not be independently ascertained.

A controller Member familiar with this airspace advised that a glider competition had been scheduled over the period and a standard warning issued in the form of a NOTAM about the concentrations of launching gliders; however, poor weather had prevented gliding activity for several days beforehand it would seem. The Member suggested that the intensity of gliders in the vicinity this day might well have been the result of delayed tasks from the competition. That said, given the high number of glider sites in the vicinity of these two military aerodromes, as the gliders could not be identified it was unclear if they were participating in the competition or not.

A glider pilot Member explained to the Board the measures taken by Competition Directors to brief ATSU's about the intended routes. These briefings would generally be updated daily to reflect any changes required by the weather and were the likely source of the brief from Lyneham ATC to the C-17A crew prior to departure about the possibility of encountering gliders whilst in transit to Brize Norton. A glider pilot Member emphasised that gliders might well be encountered up to the base of prevailing cloud. Thus with a cloudbase here estimated to be at an altitude of 4000ft, a transit above cloud at say 5000ft, might have reduced, but not eradicated, the potential for encountering gliders somewhat - a useful learning point.

This Airprox occurred in the Class G airspace midway between Lyneham's and Brize Norton's CAS. In the absence of any RT calls to the respective ATSU's, and since the gliders were untraced, there was no means of determining whether the gliders involved were fitted with RT. Whilst in all probability the gliders were radio equipped, there was no compunction on the glider pilots to communicate with ATC. Moreover, if all the competition gliders had all called Brize RADAR they might potentially have overwhelmed ATC with the sheer volume of radio traffic. Whether this could have affected the outcome here was difficult to determine, because the C-17A crew had been warned beforehand about the possibility of encountering gliders on their route. Furthermore, under the TRAFFIC Service Brize RADAR had provided 'real time' traffic information about the contacts - which were believed to be the gliders - at a range of 3nm. However, it was not feasible to determine with certainty if these were the gliders seen by the C-17A passenger from the right ACM seat and subsequently spotted by the co-pilot behind the right wing. The Board was well aware of the difficulties of seeing white gliders against a white cloudscape; methods of making these unpowered ac more conspicuous both visually and electronically were discussed and clearly some form of light-weight transponder might have been advantageous here, especially as the C-17A is fitted with TCAS. Nevertheless, that might not have given any more warning than that conscientiously provided by the controller.

Although the commander of the C-17A was concerned at the proximity of these two gliders, it would seem that the glider pilots themselves were not as concerned about the presence of the large transport ac; had they been concerned, they would probably have filed reports independently themselves. Although, in the absence of a report it could not be confirmed that the glider pilots had seen the C-17A, the Board considered it highly likely. From the C-17A pilots comprehensive account it was evident that neither he nor his crew had spotted the glider in time to take positive action beforehand. Therefore, the Members could only conclude that this Airprox had resulted from effectively, a non-sighting by the C-17A crew. Furthermore, the Members concluded overwhelmingly that there was insufficient information available upon which to base any assessment of the Risk.

PART C: ASSESSMENT OF CAUSE AND RISK

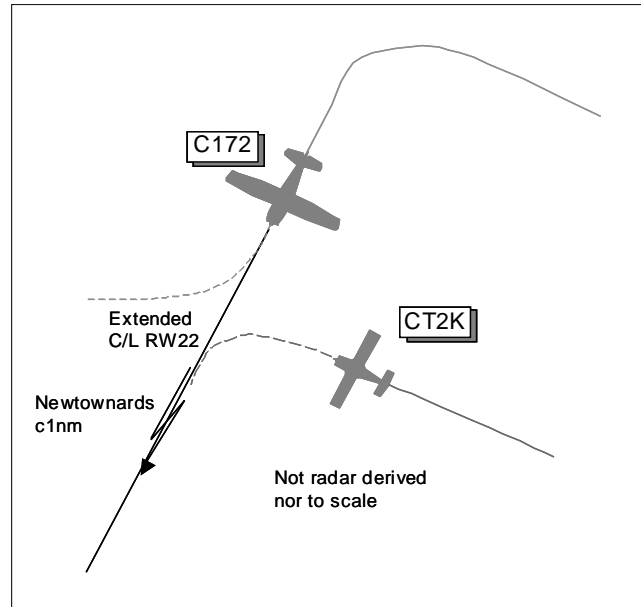
Cause: Effectively, a non-sighting by the C-17A crew.

Degree of Risk: D.

AIRPROX REPORT No 2009-071

AIRPROX REPORT NO 2009-071

Date/Time: 14 Jun 0850 (Sunday)
Position: 5436N 00540W (1nm FIN APP RW22
Newtownards - elev 9ft)
Airspace: ATZ (Class: G)
Reporting Ac Reported Ac
Type: C172 Flight Design
CT2K
Operator: Civ Trg Civ Club
Alt/FL: 400ft↓ 650ft↓
(QNH 1016mb) (QFE)
Weather: VMC CLOC VMC CAVOK
Visibility: 50km >10km
Reported Separation:
10ft V/50ft H Not seen
Recorded Separation:
NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE C172 PILOT reports flying a dual instructional training sortie with a PPL student from Newtownards VFR and in communication with Newtownards Radio on 128.3MHz; transponder was switched off. The visibility was 50km in VMC and the ac was coloured white/blue/grey with anti-collision and strobe lights switched on. This was the student's first time flying a cct having previously had a demonstration cct completed by the instructor. RW22 was in use with a LH cct. On the second cct he was aware of an ac behind him in the cct, another ac departing and 2-3 ac taxiing on the airfield. He thought that the RT frequency loading was medium with the A/G operator passing basic airfield information. The cct was initially uneventful and they turned onto final approach 1nm from the threshold at 500-600ft; the student was coping well and had established on approach close to the ideal flightpath. The instructor, called "C172 c/s final" and then he concentrated on the approach, guiding his student as necessary, and at about 400ft heading 220° at 70kt he indicated to the student to lower the final stage of flap. As the student reached for the flap switch, the instructor looked towards the student to ascertain where his eyes were focussed; not unusually, he was looking at the flap switch. Simultaneously the instructor noticed a high wing ac, a CT2K 3-axis microlight coloured white/black/yellow, approaching from their 10 o'clock displaced by 70-100ft on a constant bearing and very slightly below in a slow descent. He immediately took control and executed a climbing R turn, estimating their ac merged to 50ft laterally and 10ft vertically before their climb took effect. Looking back he saw the microlight turning onto final approach, queried whether the ac was on the frequency and, having noticed its registration, attempted to make RT contact. He assessed the risk as high. He opined that although ccts are all flown in the same direction, because 'Group A' ac fly at 1000ft agl/amsl whilst microlights fly at 700ft, ac tend to fly cct patterns of different sizes. He felt that this conflict occurred because the microlight pilot, whilst concentrating on his own cct pattern, had turned inside their pattern without ascertaining their position. Equally, once established on final, he, the instructor, had focussed on instructing his student and, not hearing any additional radio calls, felt that nothing was amiss. He accepted that if he had recognised the other ac in the cct was a microlight (either visually or by noting a particular c/s) and knowing they tend to fly smaller ccts, he would have been more attuned to establishing its position whilst he was on final. Furthermore, as he was describing the 'picture' of the RW to his student he may well have allowed his overall lookout to diminish. However, he opined that civil RT phraseology does not necessarily lend itself to increased situational awareness in the cct, as either a 'base leg' or 'final' call used by military pilots when an ac turns off the downwind leg would have alerted him to the other ac. As it was, the microlight pilot's previous radio transmission would have been 'downwind' some minutes earlier and he was not obliged to make any further calls until established on final. Having discussed the incident with the other pilot after landing, without doubt they both have learnt a very valuable lesson and it was clear to him that lookout is of paramount importance in the cct. He submitted this report in order that others may be able to learn from it.

THE FLIGHT DESIGN CT2K PILOT reports flying a solo training sortie from Newtownards VFR and in receipt of an AFIS, he thought, from Newtownards Radio on 128.3MHz squawking 7000 with Modes S and C. The visibility was >10km in CAVOK VMC and the ac was coloured white/black/yellow; no lighting was mentioned. The airfield caters for helicopter, autogyro, RAF VGS in motor gliders, GA, GA training, 3-axis and flex-wing microlight flying including training with all of these operations appearing to use different size ccts. On the morning of the incident he arrived at the airfield early, as he wanted to practise short field approach and landings in as little traffic as possible. He taxied to the RW22 hold and completed his pre take-off checks. When checking for cct traffic he noted a C172 on final and announced his intention to line-up for an immediate departure after the C172 had landed and cleared the RW. However the C172 landed and did not clear the RW but executed a 180° turn and backtracked. Its pilot then asked for permission to backtrack RW22 for take-off which he did using the 2nd half of the RW. His own departure was then delayed by another ac landing. He rotated his ac to check the cct, as his last full check had been some minutes before and there often can be non-radio microlights; on this occasion there were no other ac seen. He called again to line up for an immediate departure and executed a normal take-off; he maintained the RW heading up to the microlight cct height of 700ft before turning L to remain in the cct. Turning L to fly his downwind element parallel to the RW at the normal microlight distance of 1km he called downwind 22 L to land. He recalled hearing another recent downwind call, but was unsure if this had occurred prior to his take-off. At the end of his downwind leg, unaware of any other cct traffic, he slowed his ac to 55kt and deployed 30° flap. He executed the normal fixed wing downwind extension, remaining within the 2nm ATZ, before turning onto base leg with the Movilla Abbey cemetery to his L and hillside development of white houses to his R, at 2 o'clock. He saw no other ac during his base leg and extended his flaps to 40°, maintaining 55kt from there to the threshold. He turned gently onto the RW heading 220°, beginning his descent on the entry to the turn, estimating that he would have been at 650ft QFE as he straightened out on the RW C/L. At this point he heard another pilot call final for RW22 and report that he was experiencing an Airprox and that an incident would be filed on landing. He did not see or hear another ac, believing the other ac must be behind his, and decided that the safest thing to do was act in a totally predictable manner. He called final for RW22 to land and proceeded with his slow, steep approach to land, during which he observed his own ac's shadow on the ground to his R but not one from another ac. He landed safely and returned to the control tower. He reiterated that he did not see the other ac during the entire incident.

UKAB Note (1): The CT2K pilot is also a member of the Ulster Flying Club committee and has asked for a meeting to be convened of representatives of all the various types that use the airfield. This meeting is to discuss how operators could either conform to a single cct pattern or find a way to indicate where all ac types are relative to each other. Personally, he now makes a base leg call, which includes the phrase 'base for 22 on a microlight cct' to avoid confusion with some GA pilots, who seem to need a full 4 miles. He is currently reviewing the latest multi traffic monitoring/collision avoidance systems, but would need to convince the other group members that it was a sound investment even if other operators at the airfield might not be transmitting on any of the relevant types of equipment (ADS-B, Mode S or FLARM). Also, he is very aware of the problem of nil relative movement during convergence and how a bright, especially white, background can therefore camouflage an ac as it approaches.

UKAB Note (2): The incident occurred outside of recorded radar coverage.

UKAB Note (3): The Rules of the Air Regulations 2007 Rule 12 Flight in the vicinity of an aerodrome states (1) *Subject to paragraph (2), a flying machine, glider or airship flying in the vicinity of what the commander of the aircraft knows, or ought reasonably to know, to be an aerodrome shall:- (a) conform to the pattern of traffic formed by other aircraft intending to land at that aerodrome or keep clear of the airspace in which the pattern is formed; and (b) make all turns to the left unless ground signals otherwise indicate.* (2) *Paragraph (1) shall not apply if the air traffic control unit at that aerodrome otherwise authorises.* Rule 13 Order of landing states (1) *"An aircraft landing or on its final approach to land shall have the right-of-way over other aircraft in flight or on the ground or water".* (2) *"An aircraft shall not overtake or cut in front of another aircraft on its final approach to land".* (3) *"If an air traffic control unit has communicated to any aircraft an order of priority for landing, the aircraft shall approach to land in that order".* (4) *"If the commander of an aircraft is aware that another aircraft is making an emergency landing, he shall give way to that aircraft".* (6) *"Subject to paragraphs (2), (3) and (4), if two or more flying machines, gliders or airships are approaching any place for the purpose of landing, the aircraft at the lower altitude shall have the right-of-way".*

AIRPROX REPORT No 2009-071

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac.

Without the benefit of an RT recording, the timing and content of the RT transmissions made by both pilots were unknown. However, the SA gained from the RT is always supplementary to the basic requirements of maintaining a good lookout in the visual cct at all times, particularly for possible non-radio ac. The CT2K pilot had seen the C172 land and then depart, ahead of his delayed take-off into the visual cct; however, it seems he then forgot about this ac when he flew his standard cct using ground features as turning points. Irrespective of the different cct sizes normally flown by the various ac types using the aerodrome, the C172 had entered the cct ahead of the CT2K, thereby establishing a pattern to which other ac should conform and follow the leading ac, which had right-of-way. This did not occur, as the CT2K pilot then turned onto base-leg and final and into conflict with the C172 already on final, which he did not see, causing the Airprox. The C172 was in a position where it would have been visible to the CT2K pilot on the downwind leg, although he reported the white C172 may have merged into the background of white houses close to the FAT.

The C172 pilot was aware of another ac behind him but was undoubtedly surprised to see, albeit late, the CT2K approaching from his 10 o'clock at very close range. The instructor immediately executed a climbing R turn to avoid it, estimating the ac closed to within 10ft vertically and 50ft laterally. Although the CT2K pilot did not see the C172, the Board believed that the prompt and robust action taken by the C172 instructor was enough to remove the actual risk of collision, but the ac passed with separation margins eroded such that safety was not assured during the encounter.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The CT2K pilot did not conform to cct pattern established by the preceding traffic and flew into conflict with the C172 already on final approach, which he did not see.

Degree of Risk: B.

Airprox	Date	Aircraft	Position	Risk	Page
2009-001	08/01/09	B737-800 / B737-800	32nm SE BCN	C	15
2009-002	22/01/09	BE200 / Hawk T1A	10nm ENE Waddington	C	18
2009-003	26/01/09	Citation 11 C550 / PA28	7½nm NW Southend	C	22
2009-004	29/01/09	Robinson R44 / Meteor	7nm NW Wycombe Air Park	B	26
2009-005	13/02/09	Gazelle / Hawk	Boscombe Down	B	28
2009-006	13/02/09	Grob G103 Glider / PA28	O/H Nympsfield	C	33
2009-007	11/02/09	B737-800 / Typhoon x 2	10nm NW Newcastle	C	35
2009-008	17/02/09	Tornado GR4 / Grob Tutor	5nm W Montrose	B	40
2009-010	16/02/09	JS41 / DO228	5nm NW IOM	C	42
2009-011	24/02/09	AS350 Squirrel / Harrier GR9a	10nm SW Boscombe Down	B	46
2009-012	26/02/09	F406 Caravan 2 / PA28	2nm FIN APP RW23 Coventry	C	50
2009-014	20/03/09	AS332 / EC225	145nm SE ADN	C	53
2009-015	21/03/09	PA18 + Glider / LJ45	3.5nm SW Lasham	C	57
2009-016	20/03/09	BE200 King Air / Harrier GR7	14nm NE Wittering	B	60
2009-017	26/03/09	EC135 / PA28	3nm W Gloucestershire Airport	C	67
2009-018	16/03/09	Bell 412 Griffin / AS350 Squirrel	O/H RW23 Shawbury	B	72
2009-020	01/04/09	A321 / F16 pair	4nm SE ERING	C	78
2009-021	01/04/09	R44 / Model Ac	Adwick-Le-Street Nr Doncaster	B	84
2009-022	03/04/09	Bell 212 / Tornado GR4	10.5nm NNE Boscombe Down	A	87
2009-023	01/04/09	EC135 / BE23	1nm SE Port Talbot	C	91
2009-025	11/04/09	PA28 / C172	O/H Wellesbourne	B	94
2009-027	15/04/09	BE200 / Hawk	22nm SE INS	C	97
2009-028	21/04/09	BE200 King Air / Firefly	6nm S Cranwell	C	100
2009-029	22/04/09	DHC8 / C172	6nm SE Plymouth	C	105
2009-030	21/04/09	A320 / Untraced Glider	Approaching HEN	C	108
2009-031	25/04/09	C130J / Untraced Glider	17nm SW Benson	B	110
2009-032	24/04/09	C172 / PA28	7nm NNE WCO	B	112
2009-033	26/04/09	PA28 / MCRO1	2½nm N Cosford	B	115
2009-034	24/04/09	JS41 / B737-300	7nm NNW Pole Hill VOR	C	117
2009-035	06/05/09	EC135 / Hawk	½nm SSW Strensham HLS	B	121
2009-036	08/05/09	DHC8 / BAC167 Strikemaster	1nm FIN APP RW26 Exeter	C	124
2009-037	13/05/09	SF340B / JS31	Between SUM and KWL	B	127
2009-038	13/05/09	FK70 / Typhoon	6½nm NW OTBED	C	131
2009-040	21/05/09	PA28 / Model Ac	2.75nm SW Biggin Hill	D	138
2009-041	21/05/09	EC155 B1 / AS365	060° (T) Cromer 49nm	C	140
2009-042	24/05/09	KA6 Glider / BE200	1nm NE Lasham	B	143
2009-043	31/05/09	AA5Btiger / DHC1 Chipmunk	4nm SSW Easterton G/S	C	147
2009-044	01/06/09	Glasair RG / C17	6nm SW Brize	A	150
2009-045	02/06/09	T67M Firefly / Grob Tutor	10nm SE Cranwell	B	156
2009-046	05/06/09	B737 / PA34	7nm SW SAM	C	159
2009-047	03/06/09	C172 / VC10	11nm NE Bristol Filton	C	162
2009-048	13/06/09	Typhoon / Ikarus C42	10nm N Benson	C	166
2009-049	11/06/09	Griffin HT Mk1 / Squirrel HT Mk1	11nm SW Shawbury	B	170
2009-050	15/06/09	EC135 T2 / Lynx Mk3	2nm W Strensham	C	173
2009-051	16/06/09	AH64 Apache / Untraced Glider	5nm NE Abingdon	B	176

2009-052	16/06/09	Hawk T1 / Harrier GR9	4.5nm SW S End of Lake Bala	B	179
2009-053	16/06/09	Hawk T1 / F15E	3.5nm SW SW End of Lake Bala	C	181
2009-054	14/06/09	Ventus Glider / Untraced Light Ac	4nm NE Didcot	B	183
2009-055	16/06/09	BA146 / PA28R	9nm NW Southend	C	185
2009-056	17/06/09	Sea King Mk3 / DHC-6	1½nm N South Stack Light	C	187
2009-057	12/06/09	Thruster T600N / Thruster T600N	0.5nm N Yatesbury Microlight Strip	C	191
2009-059	21/06/09	ASK21 / Supermarine Spitfire MkVb	1nm WNW Wittering A/d	B	194
2009-060	21/06/09	DHC8 / Pitts S1S	10nm SSE Doncaster/Sheffield	C	199
2009-061	16/06/09	EC135T / Untraced Glider	2.5nm N Gloucestershire	C	202
2009-062	24/06/09	Hawk T1 / Hawk T1	13 nm S Rhyl	B	204
2009-063	24/06/09	BAe 146-301 / Piper PA23	9nm NWbW Cranfield	C	206
2009-064	25/06/09	Hawk T Mk1 / Hawk T Mk1	5nm W Dolgellau	C	209
2009-065	18/06/09	Hawk T Mk1 / Hawk T Mk1	8nm W Sennybridge	B	211
2009-066	16/06/09	C-17A / Untraced Glider	10nm SW Brize Norton	D	213
2009-071	14/06/09	C172 / Flight Design CT2K	1nm FIN APP RW22 Newtownards	B	217

NOTES