



**UK AIRPROX BOARD**

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Selected extracts from UKAB Reports  
for use by General Aviation pilots:

**Book Number 14**

**Airprox in UK Airspace  
Involving General Aviation Pilots**

## FOREWORD

The purpose of this publication is to identify for the GA community some of the flight safety lessons arising from Airprox events which occurred in UK airspace. The particular Airprox in this book have been taken from two UKAB Reports, Numbers 16 and 17 in the series *Analysis of Airprox in UK Airspace* which together cover the period January~December 2006.

Mr Hugh Woodsend, a Member of the UK Airprox Board with special interest in gliding and GA generally – notwithstanding his ongoing work as a fast-jet Test Pilot! – kindly undertook to collate this GA Book. His goal was to select from the main Reports those Airprox which identify lessons of value to a GA audience. Hugh then adds his personal commentary which you will find at the head of each of the five sections. As Hugh notes, GA covers a very wide area, from business jets down to microlights and unpowered flight. Most of the themes that he has chosen are applicable to all parts of GA and he has on purpose selected Airprox involving as much of the GA range as possible.

Please keep in mind as you read through the Airprox in this Book that the UK Airprox Board has no intention of allocating blame: the purpose of the Airprox process is to find out what happened and then to disseminate the details so that people can benefit from the unfortunate experiences of others. In this respect, I have no hesitation in paying tribute to those who reported their experiences honestly and openly so that fellow aviators might benefit.

Statistical data relating to GA operations can be found in the Tables and Figures which are included in the main Reports. These and other UK Airprox Board publications can be found through the 'Publications' page of our website at [www.airproxboard.org.uk](http://www.airproxboard.org.uk) Please pay us a visit!

In closing, whatever your experience level; whatever you fly, I hope that you will much of value to safe operations in the pages of this Book.

*Peter Hunt*

Peter Hunt  
Director, UK Airprox Board

## List of Abbreviations

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

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

## SECTION 1 - CIRCUIT RELATED INCIDENTS

This is the theme with the largest number of incidents, there being a further six during this period on top of the three described here. The key lesson identified is that pilots need to religiously follow the recommended circuit procedures. In the bad old days, before radio, this was the only way of ensuring safe separation: "tried and tested" for at least seventy five years, it behoves us all to follow the standard procedures. Several poor or non-standard circuit integration manoeuvres feature in Airprox, illustrated by the examples given here which include an incident involving two King Airs at Goodwood, one on a right base and the other calling left base (but actually also on right). Some airfields do encourage very wide circuits - which can cause problems to those not used to that procedure - but in the main a proper join on the dead side of the airfield ensures you have time to see other aircraft and their pilots have time to see you.

### AIRPROX REPORT NO 067/06

Date/Time: 2 Jun 1114

Position: 5120N 00049W (1nm FIN APP RW25  
Blackbushe - elev 325ft)

Airspace: ATZ (Class: G)

Reporting Ac Reported Ac

Type: DV20 Katana PA34

Operator: Civ Trg Civ Pte

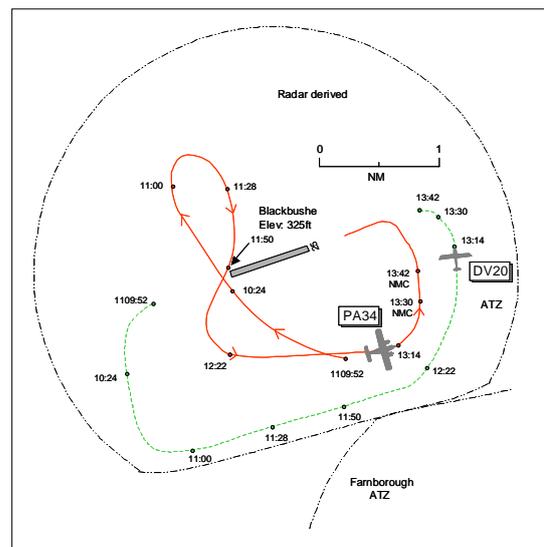
Alt/FL: 500ft↓ NR↓  
(QFE) (QFE 1018mb)

Weather VMC CLOC VMC CLOC

Visibility: >10km >10km

Reported Separation:  
100ft V&H not seen

Recorded Separation:  
NR



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

**THE DV20 PILOT** reports flying a dual local training sortie from Blackbushe and in communication with Blackbushe Information on 122.3MHz squawking with Mode C. The visibility was >10km in VMC and the ac was coloured white with a red stripe; no lighting was mentioned. Heading 250° at 70kt and 500ft QFE on final approach to RW25, she heard another ac's pilot call 'final'. She reported 'final' a second time, as she could not see another ac, but believed that it was probably on long final as its pilot had been told to give way to cct traffic. There was no response so she called 'final' for a third time. ATC asked the other pilot if he had the Katana in sight, which he did not. Both she and her student looked L and saw a white twin-engined low wing ac (the subject PA34) in their 9 o'clock about 100ft away and 100ft above, belly-up in a L turn, and descending. She banked hard L and lowered her ac's nose to avoid the PA34 as it turned onto the final approach path. The PA34 passed to their R just above, separated by about 100ft, and she assessed the risk as very high. The L turn was continued into an orbit to reposition back onto final approach.

**THE PA34 PILOT** reports flying solo inbound to Blackbushe VFR and in communication with Blackbushe Radio on 122.3MHz squawking 7000 with Mode C. The visibility was >10km in VMC and the ac was coloured white with red stripes; no lighting was mentioned. After leaving Farnborough Radar and contacting Blackbushe, he was told that RW25 was in use and the QFE was 1018mb. He set this up and requested an O/H join in order to let down on the deadside. The cct height for twins is 1200ft QFE with singles operating some 400ft lower at 800ft QFE. On entering the O/H at 1200ft he reported for the downwind join and was advised that there were other ac in the cct. Searching the downwind leg as he crossed the O/H, he reported that he did not have visual contact with the other ac. However, he then noticed one on short final so he continued the downwind join, spotting a second ac on final. Due to his height, and for separation, he extended the downwind to base leg. ATC was advising other traffic of a

## AIRPROX REPORT No 067/06

PA34 in the cct, which he presumed was his ac, so he continued the base leg turn onto final. ATC then called "PA34 c/s there is an ac below you, you will land on him, go-around". He immediately responded, putting the power on and reported "PA34 c/s going-around". ATC then announced "The Seneca is going around, missed approach to the right". The other ac was then cleared to final and he continued his climb to rejoin the cct, thinking nothing more about it other than having made a standard advised go-around for avoidance and safety reasons. He resumed the cct procedure and landed safely. Later on he was told that the pilot of the other ac might be filing an Airprox against him. He was unsure how close he flew to the other ac, which was not sighted at all, nor at which point they had started to converge nor whether she had been in the cct or joining on base leg. He went on to say that when flying a complicated twin ac solo into Blackbushe he had a number of problems to negotiate but the situation was not helped by the dual cct height and lower level traffic. Added to this were the lack of lower/forward visibility associated with twins, speed and limited position information available from ATC. He opined that the safety aspect of the dual cct height procedure should be reviewed as had he been flying at the same cct height, his forward visibility would have been greatly improved and this problem would not have occurred.

**THE BLACKBUSHE FISO** reports the inbound PA34 flight requested aerodrome information (RW25 LH, QFE 1018mb, 3 ac in the cct). When the PA34 was crosswind, he passed TI on the DV20 as being 'mid to late downwind' to which the PA34 pilot replied 'turning downwind in a minute'. No downwind report was heard from the PA34 flight, the next report heard from its pilot being 'final 25'. In view of no downwind report and seeing the DV20 on final, he queried the 'final' report. The PA34 pilot confirmed on final at which point he, the FISO, saw the PA34 descending above the DV20. He passed urgent TI to the PA34 pilot and as the DV20 commenced a turn to the L he suggested that the PA34 go-around. Its pilot queried this suggestion by which point the ac were approximately 50ft apart and closing. He then instructed the PA34 to go-around in the interests of flight safety, the prevention of a mid-air collision and all parties involved.

UKAB Note (1): The Met Office provided archive data of a Farnborough METAR as EGLF 1120Z 35010KT 9999 BKN037 18/10 Q1031= The AFISO reported the Blackbushe QNH was also 1031mb.

**ATSI** comments that as far as can be ascertained from the RT transcript, which was transcribed in note format due the very poor recording quality, the FISO provided relevant and timely TI to the PA34 flight on first call and subsequently when its pilot reported O/H. Further relevant TI was passed, including information on the DV20 Katana which was reported as being "mid to late downwind". The PA34 pilot replied as being on base leg. The FISO attempted to clarify this report but received simultaneous transmissions. Eventually he ascertained that the PA34 was "turning finals now" and having stated he had the PA34 in sight, suggested "PA34 c/s Er the Seneca" "???????" (ATSI note unintelligible transmission) as well as underneath you er I suggest you go around". On receiving the query "Is that referring to PA34 c/s" the FISO issued an executive instruction to the PA34 to go-around which was complied with. Further relevant traffic was issued. A FISO is not permitted to issue executive instructions to ac in the air: however, the FISO explained his action as necessary in the interests of immediate safety. This, in the circumstances, is accepted as a reasonable course of action by ATSI.

UKAB Note (2): The UK AIP entry for Blackbushe at AD 2-EGLK1-4 para 2.22 Flight Procedures states: - a) All circuits are to be flown south of the aerodrome. Circuit heights: Light single-engined aircraft – 800ft (AD QFE); Twin-engined and executive aircraft – 1200ft (AD QFE). At night the circuit height for all aircraft is 1000ft (AD QFE).

UKAB Note (3): An AIC 49/2006 titled Use of SSR in the Aerodrome Traffic Pattern (Trial at selected aerodromes) was in force (valid 15 May till 11 Aug). A conspicuity code of 7006 would be allocated at certain aerodromes outside CAS that do not have a discreet code – Blackbushe was a participating aerodrome.

UKAB Note (4): Analysis of the Heathrow 23 and 10cm radar recordings revealed that the Airprox was not captured but both ac are shown until the DV20 fades immediately before the incident. The PA34 is identified from a Farnborough squawk approaching the Blackbushe O/H from the ESE at altitude 2400ft QNH before the squawk disappears at 1108:23 with 4nm to run. The primary only return continues on a steady 280° track until 1109:52 when it is seen to commence a R turn 1nm SSE of the Blackbushe as another primary only return pops-up, believed to be the DV20, 1.6nm WNW of the PA34 tracking 260°. The PA34 passes just SW abeam the O/H just under 30sec later tracking 330° whilst the DV20 has turned L and steadied on a track of 170° crosswind. At 1111:00 the PA34 is seen commencing a R turn when 1nm NW of the O/H whilst the DV20 is seen tracking 075° downwind for RW25 1.7nm SW of the O/H. Twenty-eight seconds later the PA34 has turned about, passing through a heading of about 160° as the DV20 crosses 2nm ahead from R to L. The PA34 steadies on a 210° track

at 1111:50 passing W abeam the upwind end of RW25 apparently joining crosswind as the DV20 is 1.4nm SSE of the O/H, mid-point of the downwind leg, with 2 other ac ahead of it in the cct, 1 on short final with the other 1.5nm E of Blackbushe on L base. As the DV20 commences a L turn onto base leg at 1112:22 it crosses 1.6nm ahead of the PA34 which is steadying on a 090° track. This downwind track is maintained for about 50sec before the PA34 turns L onto base leg at 1113:14 with the DV20 0.9nm to its NNE tracking 360°. As the PA34 steadies on base leg 14sec later, a 7006 squawk NMC appears co-located with its primary return, with the DV20 turning L onto final approach in its 1230 position range 0.75nm. The DV20 is last seen at 1113:42 on final to RW25 0.5nm ahead of the PA34 which thereafter is seen to turn L onto the FAT and fly through the Blackbushe O/H before repositioning into the LH cct.

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

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

ATCO Members commended the actions taken by the FISO, during the critical stages of the Airprox, in issuing positive instructions to the PA34 pilot in an attempt to resolve the deteriorating situation. Pilot Members noted that prior to the Airprox the PA34 pilot did not conform with the standard O/H joining procedure of passing over the aerodrome to let down on the deadside with a L turn to cross the upwind end of the RW. Adoption of this procedure affords the joining pilot a continuous view of the active RW for departing traffic as well as traffic climbing into and already established in the traffic pattern. The dual cct height procedure applicable to Blackbushe is not uncommon at aerodromes where ac can operate with disparate speeds, providing an additional vertical separation safety element. That said, pilots flying at a higher cct height should take 'due regard' of this vertical difference by making allowances for cockpit viewpoint deficiencies and ensuring that the ac's configuration, speed and cct positioning is sorted in good time. Also, at aerodromes where A/G or FISO service is provided, use of standard RT position calls (O/H, deadside, crosswind, downwind and final) is paramount to allow all parties to build a good situational awareness of the cct traffic situation. The FISO had passed cct joining information and told the PA34 pilot of the 3 ac already in the cct. The PA34 pilot did not report downwind but was told about the DV20 which was extending downwind to fit in behind 2 ac ahead. However, as the PA34 pilot routed crosswind, he apparently had seen only the 2 ac ahead of the DV20, positioning his ac accordingly. In doing so, the PA34 pilot did not integrate safely into the Blackbushe cct and flew into conflict with the DV20, which he did not see. This had caused the Airprox.

The FISO had queried the PA34 pilot's base leg report but had received simultaneous transmissions by reply, which could possibly have been the DV20 pilot reiterating her 'final' report as well as the PA34 replying. On receiving confirmation that the PA34 pilot was turning final and seeing the relative positions of the subject ac - separated by an estimated 50ft with the DV20 commencing a L turn - he had told the PA34 pilot to go-around and this was executed promptly. The DV20 pilot heard the PA34 pilot's final call and the FISO querying the PA34's position and visual sighting of her ac. Fortunately she and her student had then visually acquired the PA34, albeit late, to their L and slightly above, turning into conflict, and she had executed a steep L turn and descent to avoid it, passing behind and below by an estimated 100ft. Undoubtedly this had been a close encounter. However, Board Members agreed that although the prompt actions taken by all parties had been effective in removing an actual risk of collision, the subject ac had passed with separation margins reduced to the extent that safety had not been assured during the encounter.

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

Cause: The PA34 pilot did not integrate safely into the Blackbushe cct and flew into conflict with the DV20, which he did not see.

Degree of Risk: B.

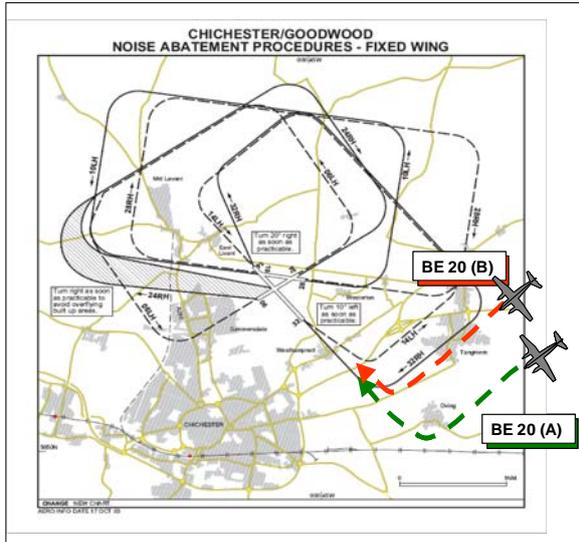
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**AIRPROX REPORT No 095/06**

**AIRPROX REPORT NO 095/06**

Date/Time: 7 Jul 0756  
Position: 5152N 00045W (Goodwood Circuit - elev 110ft)  
Airspace: ATZ (Class: G)  
Reporting Ac Reported Ac  
Type: BE20 BE20  
Operator: Civ Com Civ Exec  
Alt/FL: 700ft↓ 700ft↓  
(QNH 1017mb) (QNH 1014mb)  
Weather VMC CLBC VFR CLBC  
Visibility: >10km 10km  
Reported Separation:  
0V/ 100ftH 300ftV/ 1-2nmH  
Recorded Separation:  
NR



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

**THE BE20 (A) PILOT** reports flying a non-scheduled passenger flight into Goodwood and in receipt of an AFIS from them. All lights were switched on and they were squawking 7000, he thought, but with Mode C selected off. They and another BE20 were joining the traffic pattern for RW32. They joined right base and heard a call from the other ac reporting wide left base; on hearing this call they turned onto a 2nm final. At 1.8nm the other ac called '2nm final 32'. Their TCAS alert at this time began flashing red with an associated audio warning. There was no traffic seen on their left but they then saw the other ac in their 2.30 position at about 100ft horizontal separation so he initiated a go around. Goodwood radio called the other ac to ask why he had called left base when actually he was on right base. Its pilot then apologised. He assessed the risk as being very high.

**THE BE20 (B) PILOT** reports flying a non-scheduled passenger flight into Goodwood, squawking 7000 with Mode C and in receipt of an A/G service from them. He did not consider the event to be an Airprox: simply two ac joining the Goodwood circuit under VFR. They were good VMC at the time and the other ac was called at 5 miles final while they were at 2 miles final. He apologised to the other pilot simply out of good manners because the other ac had to go-around. He considered that there was no risk of collision.

UKAB Note (1): Goodwood is a licensed aerodrome with a 2nm ATZ and an AFIS.

UKAB Note (2): Pooley's Flight Guide, Chichester Goodwood Noise Abatement Procedures states:

*Fixed Wing:*

Standard join is overhead at 2000ft. Straight-in and base joins are strongly discouraged when the circuit is active. Outside ATC hours and after sunset overhead join is mandatory."

UKAB Note (3): BE20 (A) can be seen squawking 7000 with Mode C approaching Goodwood from the NE and descending to 2000ft. At 0751:53 the SSR seems to have been switched off as the ac then disappears from the radar recording. BE20 (B) paints throughout the event squawking 7000 with Mode C and is first seen at 5400ft descending and approaching Goodwood from the N. It then tracks towards the centreline for RW32, about 2nm behind BE20 (A) and continuing its descent from above (A). It then turns right by about 20° appearing to close the gap on (A). A primary-only contact presumed to be BE20 (A) paints for 1 sweep only at about 2nm on the centreline for RW 32 in BE20 (B)'s 10 o'clock at about 2nm. The CPA is therefore not recorded.

**ATSI** reports that both subject ac were inbound to Goodwood from the N.

The actual incident took place below/outside recorded radar cover. The SSR return of BE20 (B) is not seen until quite late in the sequence, while BE20 (A), the closest to the airfield, disappears from radar approximately 6nm NE. The second aircraft (BE20 (B)) can be seen joining for a right base for RW32.

The pilot of the second ac (BE20 (B)), advised the FISO that we would be joining **left** base for RW32 and TI was passed to all relevant ac on other known ac. BE20 (B) pilot advised the FISO that he would be extending downwind and just after this BE20 (A) reported "C/S ?????? Establish" and was given TI on BE20 (B) which was believed to be joining left base. Shortly after this BE20 (B) pilot advised "C/S we're turning finals now at 2 miles", was advised of the wind and advised that he could land at his discretion. He was further advised there was one on right base, BE20 (A), and asked if he had it in sight. A negative report was received together with the information that he (BE20 (B)) was at 1.5nm. At that point the FISO asked BE20 (A) whether he had contact with BE20 (B) but the pilot of (A) replied "Going around haven't got the traffic in sight we're at one and a half mile final".

The FISO then advised BE20 (B) pilot "I think you've turned from right base and you've got one just er behind you and to the left". At this point BE20 (A) pilot advised he had contact with traffic on his right.

There were apparently no ATS causal factors.

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

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

The Board noted that neither pilot had conducted an overhead join as recommended in Pooley's and that had they done so, it is likely that the pilots would have seen each other's ac and integrated correctly into the visual circuit. As it was, the incorrect joining call by BE20 (B) pilot had confused the situation and both the FISO and BE20 (A) pilot would have been looking in the wrong area for the former ac; it was therefore not surprising that neither saw it. It would seem also that there was confusion in the mind of the BE20 (B) pilot regarding the range of (A) from the threshold. The RT transcript had shown that the BE20 (A) pilot called at "one point five miles" but the BE20 (B) pilot thought him to be at 5 miles; therefore pilot (B) would have expected the other ac to be in a position well behind him and he did not see it almost abeam him. Notwithstanding the incorrect perceptions of the positions of both ac held by the pilots, specialist Members thought that there must have been lapses in the lookout of both pilots for them both to arrive on finals with neither seeing the other ac.

Fortunately, BE20 (B) pilot had not switched off his transponder so that his ac was detected by BE20 (A)'s TCAS, its pilot initiating a go-around. This action removed the risk of a collision but not until after there had, in the view of the Board, been a compromise to the safety of both ac.

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

Cause: While both pilots were conducting non-standard joins, the pilot of BE20 (B) incorrectly reported his position and flew into conflict with BE20 (A).

Degree of Risk: B.

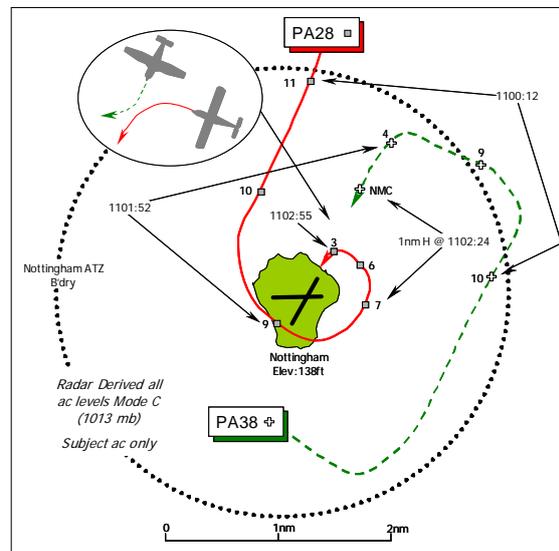
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# AIRPROX REPORT No 105/06

## AIRPROX REPORT NO 105/06

Date/Time: 8 Jul 1112 (Saturday)  
Position: 5256N 00104W (Finals RW21  
Nottingham - elev 138ft)  
Airspace: Nottingham ATZ (Class: G  
Reporting Ac Reported Ac  
Type: PA38-112 PA28  
Operator: Civ Trg Civ Club  
Alt/FL: 200ftâ NR  
QFE (1011mb) (NR)  
Weather VMC CAVOK VMC CAVOK  
Visibility: >10km >10km  
Reported Separation:  
50ftV/nil H NR  
Recorded Separation:  
Not recorded



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

**THE PA38-112 PILOT** provided a very comprehensive account reporting that he was instructing a student pilot on a circuit training detail at Nottingham in CAVOK conditions and was in communication with Nottingham RADIO A/G Station on 134.875MHz. Whilst flying on the downwind leg [in the LHD cct] for RW21 there were 2 other PA38 ac in the circuit ahead of him, additionally another that had departed after his ac and yet another – the subject PA28 - approaching the ATZ from the N calling for airfield information to join the cct to land. With one of the preceding ac in the traffic sequence in view he instructed his student to extend the downwind leg to improve the cct spacing until they had visual contact with, or heard RT transmissions from, the 2<sup>nd</sup> ac on FINAL. His student called "late downwind", and seeing the 2<sup>nd</sup> ac ahead, they then turned onto BASE-LEG. Their turn onto FINAL approach was normal and not unusually far from the airfield (i.e. it was within the ATZ) and he did not recall hearing any further transmissions from the ac joining the cct from the N. After checking that the normal approach funnel was clear himself and satisfied that the approach was clear they continued inbound at 75kt as usual. Both he and his 'low-hours' student were concentrating on maintaining an accurate FINAL approach to 'the numbers' of RW21 and he was "pattering" to the student and concentrating on "picture/speed" in slightly turbulent conditions. Heading 210°(M) passing 200ft QFE he was about to call FINAL and as he looked across the cockpit to check the ASI he was startled to see a steeply banked PA28 some 20yd to port and descending almost above and slightly to port of his ac. At the same moment the PA28 pilot called "FINAL". To avoid the PA28 he took control of his ac from the student and immediately turned to starboard, clearing the final approach path for the PA28 – which passed 50ft above his ac at the closest point - and he initiated a GO-AROUND. When they were established on the CROSSWIND leg he called Nottingham RADIO and requested to speak, after he had landed, with the PA28 pilot. The A/G Operator called the pilot of the PA28 asking him to report to the Control Tower building when he had parked his ac. The training detail was continued for a further 3 ccts in order not to disturb his student - who had remained calm throughout - before landing and speaking briefly with the pilot of the PA28. The PA28 pilot apologised, admitting that he had not seen him on FINAL but had earlier seen an ac late downwind and heard the radio call to that effect.

**THE PILOT-IN-COMMAND OF THE PA28** reports that she was inbound to Nottingham from Sherburn-in-Elmet and was in communication with Nottingham RADIO on 134.875MHz. Another very experienced pilot from her club occupied the RHS. After letting down deadside they joined the LHD cct for RW21, which was acknowledged by the A/G Operator. A single engine low-wing ac was sighted on a course parallel to the DOWNWIND leg but wide, well outside the cct area. The turn onto BASE-LEG and thence onto FINAL was executed by her colleague who took control of the ac and handed it back for the landing. Heading 210° at 80kt just before touchdown, another pilot – flying the subject PA38 - who had not called FINAL called "going around".

When they had stopped in the parking area they were asked to report to the Tower. She went to pay the landing fee and her passenger/co-pilot went to the Tower so she was not in attendance at the subsequent discussion. She assessed the risk as “nil” but did not quantify the minimum separation. As far as she was concerned, there was not an Airprox.

**THE PA28 PASSENGER/CO-PILOT** helpfully provided an account stating that he went up to the Tower where he was met by 2 individuals, who said, “...you like to do tight circuits”. He explained it was a normal cct avoiding built up areas surrounding Nottingham airfield. He was then told, that “we do big circuits here [at Nottingham] because we do flying training”. He explained that he knew all about flying training, as he had over 20 years and thousands of hours of instructing and examining. He was then asked to see the pilot instructor in the other ac who was very pleasant. He pointed out he had called “FINAL 21 to land”, which they then acknowledged he had. As a current RT examiner, he would like to point out that the correct call that the other ac should have made was “(callsign) FINAL 21, land/touch & go, contact one ahead.” Then if the pilot felt the ac landing ahead would not clear the runway prior to his own landing, that’s the time to call “going round”.

**THE NOTTINGHAM AIR/GROUND STATION OPERATOR** reports that he had just returned to the Control Tower when the PA28 called requesting joining and landing information: he was passed the active - RW21 LHD cct - and QFE (1011mb) with circuit traffic. The PA28 descended DEADSIDE and crossed over the RW03 ‘numbers’ but did not join the cct traffic; instead he cut inside the downwind traffic and did a tight cct. At the end of his downwind leg he banked L and descended with his wings at an angle of approx 45° aob. In the A/G Operator’s opinion, at no time could the PA28 pilot see any traffic on FINAL and he called FINAL while still banking, causing the PA38 who was about 200ft on FINAL to bank sharp R and to GO-AROUND on the DEADSIDE.

The PA38 pilot called to have a word with the pilot of the PA28. After vacating and parking, the PA28 pilot was asked to report to the Control Tower: his reply over the radio was “...what have I done wrong”. When the PA28 pilot reported to the Tower he was told the PA38 pilot would like a word with him. He stated that he had 20,000 hrs, was an instructor and an examiner. When told he should have known better and followed the cct traffic, his reply was “well they are doing bomber circuits”. At that point he left the Tower.

UKAB Note (1): The UK AIP at AD2-EGBN-1-3 notifies the Nottingham ATZ as a radius of 2nm centred on RW09/27, extending from the surface to 2000ft above the aerodrome elevation of 138ft amsl. The ATZ is active on Saturdays in Summer 0800-1800 UTC during which an A/G Service is provided. The cct height is promulgated as 800ft QFE.

UKAB Note (2): The Claxby Radar recording shows the PA28 approaching Nottingham from the N and identified from the Waddington assigned squawk, which was erroneously retained after the ATS was terminated. The PA28 is shown crossing the Nottingham ATZ boundary at 1100:12, indicating 1100ft verified Mode C (1013mb) – which equates to about 1040ft Nottingham QFE (1011mb). Simultaneously, the PA38 is shown circuiting LHD DOWNWIND within the ATZ – at a parallel track displacement of about 1¾nm - squawking A7000 and indicating 1000ft unverified Mode C (1013mb) – in the order of 940ft QFE (1011mb) before making the BASE-LEG turn just outside the ATZ. The PA38 is shown steady on FINALS at 1101:52, having re-entered the ATZ and descended to 400ft – about 340ft QFE –the last Mode C data evident from the ac just before the PA28 crosses the upwind threshold indicating 900ft (1013mb). Turning in LHD DOWNWIND at a parallel track displacement of slightly less than about ½nm, the PA28 descends through 700ft Mode C at 1102:24, with the PA38 1nm to the N inbound before the ac’s contact fades below coverage. The PA28 makes a virtually continuous turn onto FINALS for RW21 and is last shown indicating 300ft Mode C – about 240ft QFE at 1102:55, which is probably just as the Airprox occurred.

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

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

A very experienced GA pilot Member was concerned at the standards of training especially on the topic of operations in ‘uncontrolled’ aerodrome ccts as here. In his view, there is a widespread inconsistency in the teaching of visual ccts and instructors at some civilian training aerodromes do operate a somewhat large cct pattern. Moreover, he was concerned at the standards of lookout in the cct, which was clearly a factor here, and also that of RT.

## AIRPROX REPORT No 105/06

A military fast-jet Member – also a QFI highly experienced at elementary flying training – was of the opinion that a wide cct cannot benefit a student. Ccts should be kept compact and not allowed to become overly large. In his view it was unwise to extend downwind and, to avoid bunching in the cct, it was preferable to fly upwind if anything to ensure that the DOWNWIND leg did not become overly extended, going around if needs be. Ideally, the same pattern should be flown over the ground all the time and in his view variations of extending downwind or widening outwith the regular pattern as here do not help students. Indeed, this might be more of a hindrance because if differing patterns are flown then a different ‘picture’ is presented to the student on FINALS which could confuse ‘tyro’ pilots in the early stages of their training. An Advisor commented that this topic, amongst others, had been covered extensively at a recent CAA Safety evening but it seemed that the basics of cct work were still subject to wide inconsistencies across the different aerodromes where GA training takes place.

It was evident from the radar recording that the PA38 flown by the reporting instructor pilot was flying a fairly wide cct at a track displacement of 1¾nm from the aerodrome whilst flying DOWNWIND. Indeed, it was evident that the BASE LEG turn at the end of the DOWNWIND leg was executed outside the 2nm boundary of the Nottingham ATZ, which in the view of several Members was excessive. This seemed contrary to the very purpose for which the ATZ was established, which was to provide a measure of ‘protection’ to cct traffic in the critical stages of take-off and final approach/landing. Nevertheless, the PA38 instructor pilot had reported that the DOWNWIND leg was extended as it was necessary to improve the cct spacing, which given the very low hours of his student might have been quite reasonable under the circumstances and it seemed this was also the established pattern formed by the other ac circuiting at Nottingham.

It appeared from her report that the PA28 P-i-C saw the subject PA38 as this point was reached and believed that it was well outside the cct area. She might have thought it was departing from the DOWNWIND and would thus not be a factor to their cct to land. However it was clear that the PA28 P-i-C was mistaken in her view as the PA38 plainly continued in the cct and was shown on the radar recording on FINALS at 1102:24, 1nm to the N of the PA28 just before the latter turned inbound and apparently unseen by both the PA28 P-i-C and her colleague who from this point took control of her aeroplane. It was not until moments later that the PA38 instructor by chance himself saw the PA28 turning in ‘belly-up’ to his ac when he glanced across the cockpit at the ASI. For his part the PA38 instructor should also have been aware of where the other ac were in the cct from their pilot’s RT calls - if they were made - but at aerodromes where only an A/G Station or Aerodrome Flight Information Service is provided RT recording is not obligatory and in the absence of an RT transcript the Board was unable to resolve what was actually said on RT. A commercial pilot Member was also critical of the PA28 pilots’ tight join into the existing cct pattern and for not taking more account of the potential presence of extremely inexperienced student pilots flying in the cct. A military controller Member observed that the PA28 had flown down from Sherburn-in-Elmet, which is situated in the Linton-on-Ouse MATZ and where the ccts were necessarily tight because of the adjacent military training airfield. Consequently, such ccts might be the norm for the PA28 P-i-C. Whilst the PA28 passenger/co-pilot might have many hours instructing and examining, in the view of the experienced pilot Members, this was an unnecessary and avoidable Airprox. Some considered whether the P-i-C should have allowed him to take control at this stage but their appeared to be a significant CRM issue here and the P-i-C might well have been loath to countermand her more experienced colleague, especially if she had not seen the PA38 either. Nevertheless, the radar recording evinced that the PA38 was plainly there to be seen before the PA28 pilots turned in toward FINALS. Safe integration of the PA28 into the established pattern was the crux of this Airprox. The overwhelming view of the Members was that the PA28 pilots had not taken account of the subject PA38 when their ac was turned onto FINALS because they had not seen it. Irrespective of the size of the pattern or whether the PA38 instructor had called FINALS or not, the visiting PA28 pilots should have integrated their arrival safely with the other traffic which was plainly there to be seen in the prevailing CAVOK conditions and in accord with the principles enshrined in Rule 17 of the Rules of the Air Regulations 1996. Specifically, Rule 17 (5) - *Flight in the vicinity of an aerodrome* – which required the PA28 pilots “*Without prejudice to the provisions of Rule 39, a flying machine...while flying in the vicinity of what the commander...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...;

and at Rule 17 (6) - Order of landing

(a) An aircraft while landing or on final approach to land shall have the right-of-way over other aircraft in flight....

*(b) (i) ... in the case of two or more flying machines...approaching any place for the purpose of landing, the aircraft at the lower altitude shall have the right-of-way, but it shall not cut in front of another aircraft which is on final approach to land or overtake that aircraft.*

In the view of the Board, the PA28 pilots did not join the Nottingham cct in a safe manner and concluded that this Airprox had been caused because the PA28 pilots did not integrate safely into the Nottingham A/D cct in accordance with Rules 17 (5) & (6) of the Rules of the Air Regulations 1996 and flew into conflict with the PA38 on final approach, which they did not see.

Turning to the inherent risk and notwithstanding that the PA28 P-i-C opined that there was “not an Airprox”, none of the pilots involved here were aware of the proximity of the other’s ac until a very late stage indeed. The PA28 pilots were apparently oblivious to the PA38 below them on FINALS as they turned onto FINALS themselves in a tight L bank belly-up to the latter. A Member pointed out that it was only fortuitous that the PA38 instructor had spotted the PA28 when he did and was able to take robust action to turn away and execute his go-around. The radar recording had not revealed the exact geometry at the CPA, but it seemed that it was only the PA38 pilot who could see what was happening at this point and who reported that the PA28 passed 50ft above his ac before he managed to turn out of the way. There was no reason to doubt the veracity of the PA38 instructor’s report and this was clearly a close quarters situation. Whilst his robust avoiding action had ensured that the two ac did not collide the Board concluded, unanimously, that the safety of these two ac had certainly been compromised in the circumstances reported here.

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

Cause: The PA28 pilots did not integrate safely into the Nottingham A/D cct in accordance with Rules 17 (5) & (6) of the Rules of the Air Regulations 1996 and flew into conflict with the PA38 on final approach, which they did not see.

Degree of Risk: B.

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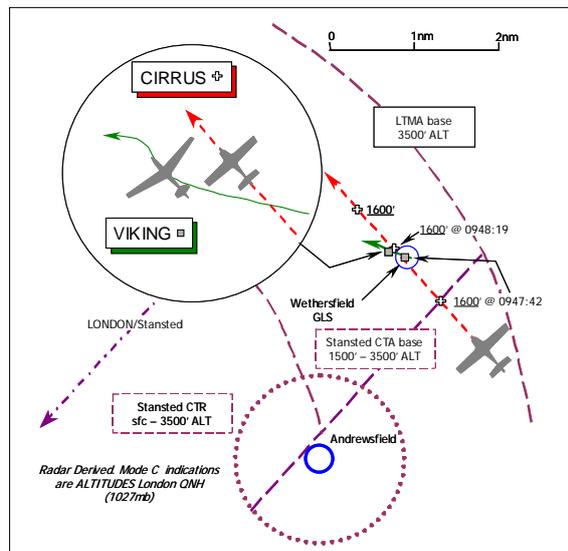
# AIRPROX REPORT No 007/06

## SECTION 2 - GLIDING SITES

Next highest number of incidents involves overflying gliding sites. Most of the sites do not have zones around them, Halton being a notable exception, but flying over an active site, especially one with wire launching, is one of the most dangerous things people can do in aviation. Surviving a wire strike is a very unlikely outcome in any aircraft. An exercise last year showed that an aircraft cruising above 120kts is unlikely to be seen when the glider crew make their clearance check prior to a launch. Aeronautical charts are now marked with the maximum height above sea level (QNH), usually 2000ft or 3000ft above the ground, of the launch activity. Above the launch height you can expect a high concentration of gliders that launched earlier, up to cloudbase or limiting airspace above the site. Make sure your charts are properly marked. If you use electronic mapping, check that gliding sites are marked correctly too as experience has shown that some e-maps do not include all sites.

### AIRPROX REPORT NO 007/06

Date/Time: 21 Jan 0948 (Saturday)  
Position: 5158N 00030E (Overhead Wethersfield elev: 321ft)  
Airspace: London FIR (Class: G)  
Reporting Ac Reported Ac  
Type: Viking Glider Cirrus SR22  
Operator: HQ PTC Civ Pte  
Alt/FL: 1400ft 1500ft  
(QFE 1015mb) (amsl)  
Weather VMC CAVOK NR CAVOK  
Visibility: >10km >10km  
Reported Separation:  
200ft V/300m H 500ft V/500m H  
Recorded Separation:  
0.2nm H



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

**THE VIKING GLIDER PILOT** reports that his glider is white with red wingtips and 'dayglo' stripes. He was operating from Wethersfield whilst in communication with Glider CONTROL on 128-975MHz and had just executed a winch launch to a height of 1400ft QFE (1015mb) [in the order of 1760ft QNH (1027mb)] on a heading of 280°. After releasing from the cable he turned R into wind onto a heading of 320°, which is when the other ac – a low-wing single engine Cirrus monoplane – was first seen 300m away as it overtook his Viking Glider some 300m to starboard on a parallel course and about 200ft below his glider. No avoiding action was taken as the other ac was passing clear when first spotted so a level cruise at a speed of 50kt was maintained. He assessed the risk as "low".

The prevailing weather was CAVOK with a flight visibility of 20km whilst flying out of the sun. The reporting glider pilot was concerned over the potential danger to the other ac from the winch wire. He added that ac flying clear below the Stansted CTA sometimes route far too close to the GLS at Wethersfield.

UKAB Note (1): The UK AIP, at ENR 5-5-1-6, promulgates that Wethersfield Glider launching site is active during daylight hours for aerotow and winch launches, which may attain a height of 2000ft agl, above the site elevation of 321ft amsl.

**THE CIRRUS SR22 PILOT** reports that he was on a VFR flight from Antwerp bound originally for Duxford with another pilot but their destination was subsequently changed, whilst enroute, to Cambridge. They had just been released by Shoreham [it was actually Southend] but had not yet switched to Cambridge and he was navigating using the electronic map in the Cirrus [although it was subsequently ascertained that a topographical VFR+GPS chart was available to them in the ac]. A squawk of A7000 was selected with Mode C.

Flying in a level cruise at 170kt at an altitude of 1500ft QNH in CAVOK weather, they approached an old airfield that they could see from the crosses painted on the runway was closed: unfortunately the electronic charts did not show it. Neither were they aware that it was used as a glider launch site at certain times. Approaching this unknown airfield they observed some gliders on the ground, so to ensure that they were not flying in the immediate vicinity of any wires etc, they diverted slightly to fly overhead these gliders on the ground. He then spotted an airborne glider about 1000m away above and to the left of his ac. Minimum vertical separation was 500ft as the glider passed above and about 500m to port with a "low" risk of a collision. No avoiding action was taken as the relative courses did not converge so as there was no confliction they continued on to Cambridge. After landing they were asked to telephone the glider site, which he did.

UKAB Note (2): In a subsequent telephone conversation with the other pilot who was flying in the ac, it was determined that the original planned route was to pass to the SW of Stansted inbound to Duxford. Whilst a topographical VFR+GPS chart was available to them they did not refer to it and consequently were unaware that Wethersfield glider launch site lay ahead of them along their revised course. Acknowledging the danger posed by the winch cable, he opined that the Cirrus's electronic map display is usually most reliable.

UKAB Note (3): The Debden radar recording shows the Cirrus squawking A7000 on a steady NW'ly track, maintaining an altitude of 1600ft unverified Mode C (1027mb) as it crosses the lateral SE boundary of the Class D Stansted CTA stub at 0947:42, where the base altitude is 1500ft amsl. Meanwhile a primary contact, believed to be the glider flown by the reporting pilot, is shown departing from the immediate vicinity of Wethersfield on a westerly course before turning onto a WNW'ly track and directly in the Cirrus pilot's 12 o'clock at a range of 1.3nm. The Cirrus overhauls the glider on a track marginally to the W of Wethersfield and subsequently passes 0.2nm [400yd] to the E of the glider at 0948:19 as it starts to overtake the latter to starboard, broadly in accord with the reports of both pilots. The glider pilot's reported height of 1400ft QFE (1015mb) would equate broadly to an altitude of 1760ft QNH (1027mb), suggesting that the glider was in the order of 160ft above the Cirrus's indicated 1600ft QNH unverified Mode C.

UKAB Note (4): The 0950UTC Stansted METAR gives 310/08kt CAVOK 05/04.

**HQ PTC** comments that this incident highlights the dangers of relying on electronic aids whose database may not be complete. The VGS squadron operates under a permission letter issued by the CAA [8AP/06/02/05 dated 3 Oct 05], which allows the unit to launch to 2000ft agl. An LoA between Stansted and the VGS allows them to operate to 2300ft QNH. The squadron activate this by telephone when they begin gliding operations and close it when they finish, thereby allowing the VGS gliders to operate legitimately in this Class D CAS.

## **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.

A pilot Member opined that modern electronic aids to navigation can be very useful but are not the complete answer and here the Cirrus pilot reports that the ac's navigational database was apparently less than comprehensive. Usually, when operated correctly such devices will give adequate warning of hazards ahead but in the Board's view it was unwise to rely solely on the electronic database within the Cirrus. It was apparent from the Cirrus pilot's frank report that they were completely unaware of the gliding activity at Wethersfield before they sighted the gliders on the ground. Acknowledging that this was a short-notice change to the Cirrus pilots' planned route, Members opined that reference to VFR charts – that were carried in the ac - would have revealed the danger from winch cables at Wethersfield: the salutary lesson here was to ensure that when faced with a short-notice change of plan you consult all the information available and check carefully for hazards along the new route. With two pilots in the Cirrus there seemed to be little reason for not complying with this basic tenet of good airmanship. Perhaps understandably, the Viking glider pilot had not spotted the Cirrus approaching from abaft the port beam during the winch launch until he turned R into wind, which was when the Cirrus overtook his glider. Whilst it was there to be seen, gliders on winch launches climb at a very high pitch attitude and the Board was briefed that the speed of the Cirrus's approach would have prevented it from being spotted before the launch was initiated. With little further debate the Board concluded that this Airprox had resulted because whilst flying in the vicinity of a notified and active glider launch site of which he was unaware, the Cirrus SR22 pilot flew into conflict with the Viking glider.

## AIRPROX REPORT No 016/06

In their assessment of the intrinsic risk of collision here, the Board was charged with considering the risk of a collision between the ac involved and not a collision between the Cirrus and the winch wire nor what might have happened if the situation had been slightly different. Nevertheless, the Viking glider pilot reports that he released the winch cable at an altitude of about 1760ft, broadly 160ft above the Cirrus pilots flying at an altitude of 1600ft - as evinced by the radar recording - and thus flying above the base of the Stansted CTA within Class D CAS, apparently without a clearance. Therefore, the Cirrus pilot was extremely fortunate that his ac had not been struck by the cable, after it had been released by the glider pilot and just moments before the Cirrus overflew Wethersfield. The Viking pilot was unaware of the Cirrus until it overtook his ac to starboard and so he had no influence on the eventual outcome. Fortunately the Cirrus pilots had detected the Viking glider at a range of 1000m, which would have enabled them to turn away and afford the glider a wider berth if needs be. As it was, no avoiding action was considered necessary by either pilot and the Board agreed that there had been no risk of a collision between these two ac in the circumstances reported here.

### PART C: ASSESSMENT OF CAUSE AND RISK

**Cause:** Whilst flying in the vicinity of a notified and active glider launch site of which he was unaware, the Cirrus SR22 pilot flew into conflict with the Viking glider.

**Degree of Risk:** C.

## AIRPROX REPORT NO 016/06

**Date/Time:** 9 Feb 1709

**Position:** 5318N 00144W (0.7nm NNW of Camphill Glider Site - elev 1350ft)

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

**Type:** Puchacz Glider Pilatus PC12

**Operator:** Civ Club Civ Exec

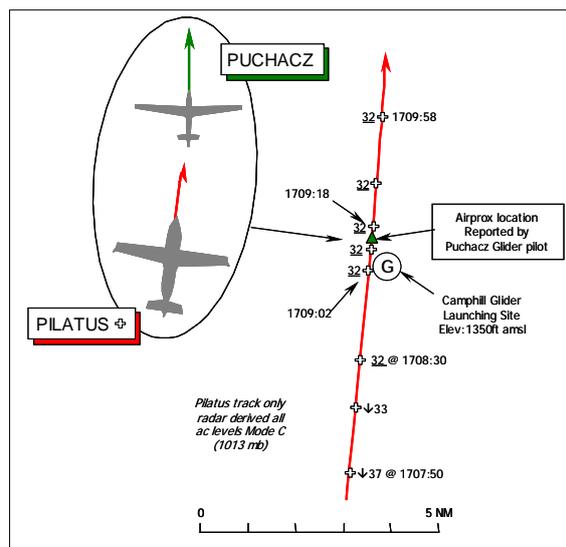
**Alt/FL:** 1200ft FL40  
(QFE) (SAS)

**Weather** VMC VMC

**Visibility:** 15km 10km

**Reported Separation:**  
4-500ft V/nil H Not seen

**Recorded Separation:**  
Not recorded



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

**THE PUCHACZ GLIDER PILOT**, a gliding instructor, reports that his glider is coloured white with red wingtips/tail. He was in communication with Camphill Glider Site on 129.975MHz whilst winch launching with a student to 1400ft. After the launch they continued to the N of the site with the intention of then joining the Camphill circuit at about 800ft agl. They were flying at 48kt, some 800ft below cloud with an in-flight visibility of 15km. At a position 53° 18' 54"N 001° 44' 27"W - about 0.7nm NNW of the glider site and shown on the diagram by a green triangle - heading 360° (T) in a straight descent through 1200ft QFE above Camphill's elevation of 1350ft amsl [an altitude of about 2550ft amsl], he spotted overhead what he thought was a low-wing business jet, [but actually the PC12] overflying his glider no more than 4-500ft directly above him as it overtook from astern. The other ac disappeared in the direction of Leeds Bradford. Although he did not quantify the risk he added that the other ac was flying within the normal winch launch altitude band of up to 3350ft amsl

**THE PILATUS PC12 PILOT** reports that he was inbound to Leeds Bradford from Tatenhill and in receipt of a RIS from Leeds Bradford on 123.75MHz. The ac which has a blue livery was crewed with two pilots. The SSR was selected on with Mode C; TCAS is fitted. An extract of the flight log for this sector was helpfully included along with a copy of the IFR flight plan files and IFPS acknowledgment to assist with the investigation. In the vicinity of Camphill his ac would have been heading 015°, at 235kt in a level cruise at FL40, flying in VMC some 500ft clear above cloud in between layers with a flight visibility of 10km, but no other ac was seen at the reported Airprox location.

UKAB Note (1): The US Naval Observatory table of Ephemeral data gives the time of Sunset in the vicinity of Camphill as 1706UTC on 9 Feb: hence night would have prevailed from 1736, after the Airprox had occurred.

**THE PILATUS PC12 OPERATOR** comments that this Airprox occurred within the 'Open FIR'. At the time of the occurrence the Pilatus crew was under a radar service from Leeds Bradford ATC - previously a FIS from Nottingham/East Midlands ATC - but no reports of any conflicting primary or secondary traffic was received. The Met conditions experienced by the reported crew at the time were 'VMC on top' of broken cloud [5-7 Oktas] at 2700ft; visibility 12km. The operator opined, [erroneously] that any gliding activity conducted above cloud is prohibited.

The reported ac was flying an IFR flight planned route and crews have now been briefed to fly airways routes only in this area to prevent "infractions" with other ac in the lower airspace.

UKAB Note (2): The Pilatus pilot's report was not received by the UKAB until 10 April and when queried with ATSI it was ascertained from Leeds/Bradford ATC that the RT recordings for the day of the Airprox had already been returned to service. Consequently, ATSI could add nothing further.

UKAB Note (3): The UK AIP at ENR 5-5-1-1 promulgates that Camphill glider launching site is active during daylight hours for winch launches which may attain a height of 2000ft above the site elevation of 1350ft amsl – some 3350ft amsl.

UKAB Note (4): From Meteorological Office archives, the Manchester 1650 UTC METAR was: 33006KT 300V040 9999 FEW041 03/M05 Q1021 NOSIG. The Leeds Bradford 1650 UTC METAR was: 31007KT 270V350 9999 FEW040 01/M05 Q1020. The East Midlands 1650 UTC METAR was: 34010KT 9999 BKN046 04/M05 Q1019.

UKAB Note (5): This Airprox is not illustrated clearly on the radar recording because the Puchacz glider flown by the reporting pilot is not shown at all. The Pilatus PC12 is shown on the Clee Hill Radar recording approaching the reported Airprox location directly at a GS of 210kt, squawking A7000, descending through 3700ft Mode C (1013mb) at 1707:50. The Pilatus levels at 3200ft (1013mb) at 1708:30 and is shown passing 0.4nm W abeam Camphill Glider Site a little over 32 sec later at 1709:02. The Pilatus maintains a constant 3200ft (1013mb) as the turbo-prop passes directly over the reported Airprox location - as plotted accurately on the NATS Radar Replay System (NRRS) - just before 1709:18, 0.7nm NNW of Camphill Glider launching Site level at 3200ft (1013mb) and maintaining a steady course. A level of 3200ft (1013mb) related to the Manchester QNH of 1021mb (some 19nm W of the Airprox location) would equate to an altitude of about 3440ft amsl. This suggests that the PC12 was about 890ft above the Puchacz glider pilot's reported altitude of about 2550ft and broadly 90ft above the maximum winch launch altitude of 3350ft as the ac passed abeam Camphill.

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

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

It was immediately apparent to the Members that the glider site at Camphill was, unusually, at a relatively high elevation and indeed is one of only 4 glider sites notified in the UK AIP as being sited above an elevation of 1000ft amsl. The gliding Member explained that in his view there are several reasons why it is unwise to overfly in the immediate vicinity of Camphill. Firstly, he stressed that as the site is perched on top of a hill, the winch launch could attain a height of 2000ft above the site elevation of 1350ft amsl – an altitude of some 3350ft – such that winch wires could be encountered at relatively high altitudes. Thus depending on the RPS/QNH in use, ac crossing at altitudes similar to that chosen here by the PC12 crew could potentially suffer a wire strike. Additionally, Camphill is an active 'wave' site which experiences wave in any wind direction: therefore, large concentrations of gliders may be found up to the limit of CAS [base level FL65]. There is also an agreement with Manchester ACC for a

## AIRPROX REPORT No 016/06

'wave box' which permits flights to higher levels under specific rules. Pilots planning low and medium level routes in this area should be aware that the wave, whilst generating good lift, also generates severe sink and Camphill can experience up to 10kt - about 1000ft/min - of sink at times. But another feature of good 'wave' is that outside the areas of lift and sink, there may well be areas of extreme turbulence. Armed with the advice of the gliding Member and noting that the Board only considers what actually happened and not what might have occurred in other situations, Members turned to the assessment of the circumstances surrounding this specific Airprox.

Fortunately, here the PC12 spotted by the Puchacz instructor was somewhat higher than he had estimated. According to the radar recording, the PC12 was of the order of 90ft above the maximum cable altitude that could normally be expected at Camphill. Moreover, the turboprop had passed over the winch launch site after the glider had reached its maximum height and released from the cable. Fortunately therefore, no harm was done in that respect (but a Member added there could quite easily have been another glider in the process of launching) . It was evident that the glider pilot could not have seen the PC12 beforehand, approaching fast from astern, neither could the glider launch ground crew have detected it before the launch. It was unfortunate that the Board did not have the benefit of a transcript of the RT and a report from the Leeds Bradford controller to complete the picture so here the ATC aspects remained unclear. Whilst it was evident that the encounter occurred in Class G airspace and the Board recognised that PC12 crew was perfectly entitled to be flying this route quite legitimately, Members agreed it was unwise to fly so close to the glider launch site at these altitudes and it would be preferable to afford such sites a wider berth. Here the PC12 pilot was unaware of the glider below him but the Board was encouraged by the positive stance taken by the PC12 operator in the interests of flight safety and, in general, choosing a routeing in CAS where available was a sensible option. Clearly the glider pilot was entitled to be operating where he was - in this instance it was not above cloud – and the BGA Member stressed that the PC12 operator was mistaken if he believed that glider pilots were not entitled to operate VFR above cloud, which in the UK, they are permitted so to do. Nevertheless, the radar recording had also revealed that the PC12 was at a somewhat higher relative altitude above the glider than the Puchacz instructor had estimated and given the glider pilot's reported altitude of about 2550ft, the vertical separation evinced by the recording was in the order of 890ft. Therefore, the Board concluded, that this Airprox was a sighting report of traffic in the vicinity of a notified and active glider launching site with no risk of a collision between the ac involved.

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

Cause: Sighting report in the vicinity of a notified and active glider launching site.

Degree of Risk: C.

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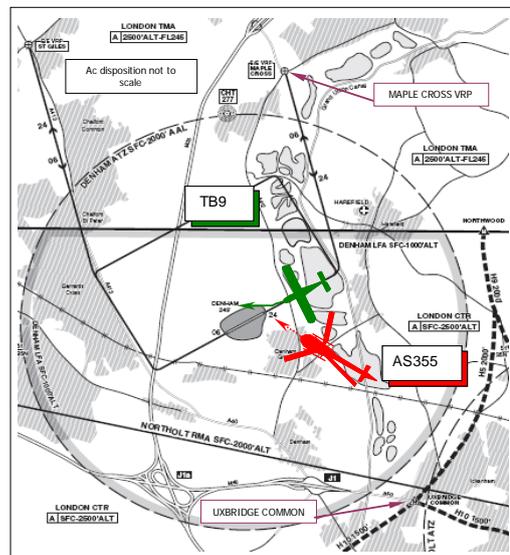
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## SECTION 3 - AIRFIELD PROCEDURES

During the last 12 months, there has been a number of incidents involving airfield procedures. There are two official 'bibles', the AIPs - one civil, one military - and several other good publications. The AIP is not designed to travel in an aircraft and therefore nearly all pilots carry some form of suitable reference material with them. It is the responsibility of airfield operators to ensure that all the published entries are consistent: pilots can help in this regard by drawing attention to any discrepancies. We also had Airprox which involved complex local procedures which were either difficult for visitors to follow or had not been updated. There are several airfields where there are parallel runways or where the taxiway is no longer in use, requiring backtracking. Encourage airfield operators to ensure that procedures are well defined and easy to understand and that everyone is following them.

### AIRPROX REPORT NO 113/06

Date/Time: 23 Jul 1230 (Sunday)  
Position: 5135N 00031W (Final approach RW24 Denham - elev 249ft)  
Airspace: Denham ATZ (Class: A)  
Reporting Ac Reported Ac  
Type: TB9 AS355  
Operator: Civ Pte Civ Comm  
Alt/FL: 350ft 50ft↓  
 (QFE 1011mb) (QFE 1011mb)  
Weather VMC CLBC VMC CAVOK  
Visibility: >10km 10km+  
Reported Separation:  
 Nil V/30m H Nil V/60mH  
Recorded Separation:  
 Not recorded



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

**THE TB9 PILOT** reports that his ac has a white/blue colour-scheme and the HISLs were on whilst flying circuits to RW24 at Denham, which has a fixed direction - RHD. He was in receipt of an AFIS from DENHAM INFORMATION on 130.725MHz and SSR was selected off in the Cct.

The helicopter was joining Denham from the S and the pilot had been "instructed" by the FISO to report downwind for RW24. He observed the AS355 continue directly towards the airfield and so he turned on his TB9's landing lights to make the ac more visible. Turning onto final approach for RW24RH, heading 240° at 80kt passing 350ft QFE (1011mb), the helicopter flew directly into the cct from his L as its pilot announced he was on FINAL to land. He was compelled to take action to avoid the helicopter which passed some 30m to port at the same height as he banked R and executed a GO-AROUND. The risk was assessed as "high".

**THE AS355F1 HELICOPTER PILOT** provided an extensive and comprehensive account reporting that he was flying single pilot from the RHS pilot position. He was engaged in a photographic sortie of the mainline railway from Maidenhead to the marshalling yard NE of Acton, with the camera operator sitting directly behind him operating the specialist camera fitted to the underside of the helicopter. At about 1300 he elected to depart the area of the marshalling yard and proceed to Denham for fuel.

He had been under the 'control' of Heathrow APPROACH for about 2 hours before the Airprox and in order to proceed to Denham was cleared by APPROACH to transit W along H10, passing S of Northolt towards UXBRIDGE COMMON reporting point.

## AIRPROX REPORT No 113/06

At UXBRIDGE COMMON he requested a frequency change to Denham which was approved by Heathrow APPROACH who instructed him to maintain his SSR code until on the ground at Denham. Descending to 1000ft London QNH he contacted Denham, clearly stated his position at UXBRIDGE COMMON and requested a join from this position giving all the “normal” information.

Denham - erroneously he thought that it was an A/G Service from Denham RADIO at the time - responded by telling him to report at MAPLE CROSS and gave him the runway and circuit direction. It was “immediately obvious to him” that the A/G Operator – actually the AFISO - was inexperienced and had “no idea where he was”. In his view a join at MAPLE CROSS was not the best thing to do for the following reasons:

He would have to cross the extended centre line thus passing through the cct traffic and those ac on approach;

Aware of the delay that this would cause, he considered that the requirements of his sortie would best be served by joining from his current position;

He considered that this was the safest approach as traffic was circuiting to RW24RH and he would be remaining to the S of RW24.

He still thought that Denham had no idea what he was asking for and no real idea of where he was so he entered an orbit just NW of UXBRIDGE COMMON and repeated his full joining call emphasising his current position. He does not recall the exact response from Denham but it was “approved” and he felt that the “radio operator” had a clearer picture of where he was. Proceeding to make ground towards Denham, aiming to join L BASE-LEG for RW24, he made another call to Denham advising that he was going to join left BASE-LEG RW24. This was clear and unambiguous. He does not recall the exact response from Denham but there was a delay and he remembered commenting to his camera operator because of the lack of immediate response. Whilst starting to descend L BASE-LEG for RW24 he called FINALS, and he believed that the “radio operator” responded “roger” or something like that, but he still felt at this point that she didn’t have a “full grip” of what was going on. Within his FINALS call he pointed out that he was visual with the ac that had just landed on RW24 that was about 2/3 of the way along the runway. He chose to continue knowing that he was making an approach to the threshold of RW24 and not requiring the runway surface at all. At this point neither himself nor his camera-operator passenger had heard any ‘FINALS’ call from any other ac nor did he see any other ac on FINALS, “assuming” there would be none as there was an ac still on the runway. Some 50yd SE of the threshold to RW24 descending through 50ft heading 300° at 30kt, just before reaching the hover at the threshold he saw another ac – the TB9 - pass down his starboard side about 60m away at about the same height or possibly a little (10ft) lower, which called overshooting; this was the first time that he had heard this callsign. Evidently both were on an approach at the same time, his helicopter from slightly S of the extended centreline and the TB9 lined up on the centreline of RW24.

The risk was assessed as “*high*”. He added that in his view the Denham RADIO operator [FISO] had “no spatial awareness of what ac were where in the circuit and could not grasp that he was not following the fixed wing procedure even though he made his intentions clear and she agreed to these alternative arrangements”.

**THE DENHAM FLIGHT INFORMATION SERVICE OFFICER (FISO)** reports that the AS355 pilot called to join from a position at UXBRIDGE COMMON. The AS355 pilot was told to report DOWNWIND RW24 RIGHT HAND if visual with the two ac downwind. This message was acknowledged by the AS355 pilot who proceeded to report for L BASE for RW24 with an ac on FINAL and one on BASE-LEG. The ac on FINAL landed as the TB9 on BASE established on FINALS. The AS355 pilot was “corrected” by being informed that the runway in use was RW24RH, whereupon the AS355 pilot reported FINAL in front of the TB9 established on FINAL, with an ac on the landing rollout on RW24. Thus the AS355 pilot was told to use the grass on the north-side to RW24 at his discretion and the TB9 on FINAL behind him went around.

UKAB Note (1): The UK AIP at AD2-EGLD-1-1 notifies the Denham ATZ as a radius of 2nm centred on RW06/24, extending from the surface to 2000ft above the aerodrome elevation of 249ft amsl. An AFIS or A/G Station operates variously during 0700-1900 in Summer on 130.725MHz.

UKAB Note (2): The UK AIP at AD 2.22 – Flight Procedures specifies that:

There is no overhead joining procedure. All aircraft in the Denham Local Flying Area (LFA) are restricted to a maximum altitude of 1000 ft amsl.

Circuit joining is achieved by establishing a long base leg and giving a position report at Chalfont St Giles for left hand circuits or Maple Cross for right hand circuits. The ATZ should be entered at a height of 750ft agl (1000ft amsl). Joining traffic should give way to circuit traffic.

Helicopters should follow fixed-wing procedures unless alternative arrangements have been made.

Denham LFA is that part of the Denham ATZ which lies within the London Control Zone (Class A). Flights without compliance with IFR requirements may take place in the LFA subject to the following conditions:

- i Aircraft to remain below cloud and in sight of the ground;
- ii Maximum altitude: 1000ft QNH;
- iii Minimum flight visibility: 3 km.

Pilots of aircraft flying in the ATZ are responsible for providing their own separation from other aircraft.

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

**FOI (H)** reports that the TB9 was flying RHD circuits to RW24 at Denham when an AS355 joined from the S, the pilot of which was "instructed" to report downwind for RW24. The AS355 pilot continued directly towards the aerodrome and as the TB9 turned onto FINAL the AS355 flew directly into the cct and announced he was on FINAL to land, whereupon the TB9 carried out a GO-AROUND. Subsequent discussions with the AS355 pilot established that he had not flown regularly for some time and had only recently gained his commercial licence. The pilot accepts that he did not comply with the published joining procedures for Denham and that it would have been more appropriate to have left the London CTR at NORTHWOOD reporting point and joined via MAPLE CROSS. Had he done so, the conflict with the TB9 would probably have been avoided.

**ATSI** comments that the Manual of Flight Information Services (CAP410) – Part B Aerodromes contains information for the guidance of FISOs. Chapter 1 Para 2.1 RESPONSIBILITY OF FISO describes the specific responsibilities, the first two of which are:-

a) *issuing information to aircraft flying in the aerodrome traffic zone to assist the pilots in preventing collisions;*  
(and)

b) *issuing instructions and information to aircraft on the manoeuvring area to assist pilots in preventing collisions between aircraft and vehicles and obstructions on the manoeuvring area or between aircraft moving on the apron."*

In addition, Para 7.4 Joining circuit states:-

"Landing direction and traffic information on known traffic flying within the ATZ and the immediate surrounding local area is normally passed when the aircraft is still some distance away from the ATZ. This enables the pilot to determine if it is safe to proceed with the flight as planned and to intelligently position the aircraft in relation to other aircraft in the circuit pattern. FISOs are not to instruct pilots to join the circuit at a particular position. Furthermore, FISOs may not allocate a landing order, e.g. 'Report final number 3'. The pilot must be told that there are two aircraft ahead in the circuit and it is up to the pilot to position himself accordingly. Although there is a legal requirement for pilots to report entering and leaving the ATZ (Rule 39 of the Rules of the Air Regulations), this is not the case for other reports in the circuit. Any requests for position reports downwind, final etc., for the purposes of passing traffic information, only have the status of a request although it is expected that most pilots will comply."

Denham Aerodrome does not record the RTF and is not required to do so. As a result it is not possible to establish without doubt the timings and contents of the messages issued by the parties involved. Consequently, reliance has to be placed on the available written reports and for the Denham FISO's part it would appear that she fulfilled her responsibilities in the provision of a FIS to the respective flights operating within the Denham ATZ.

The overarching principle in the provision of FIS at an aerodrome, is stated in CAP410 in the introduction..."*A Flight Information Service (FIS) provided at an aerodrome is a service provided to give information useful for the safe and efficient conduct of flights in the Aerodrome Traffic Zone.*" Faced with the helicopter reporting

## AIRPROX REPORT No 113/06

approaching from a direction which did not readily give safe access to the published entry VRP, MAPLE CROSS, the FISO's decision to request the helicopter to report downwind for RW24RH was prudent because she was acquitting both her overall and specific FISO responsibilities. Requesting a report at MAPLE CROSS may have induced the pilot to adopt a route that could have placed his helicopter into direct conflict with RW24RH cct traffic, particularly those on a R BASE-LEG.

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

Information available included reports from the pilots of both ac, a report from the aerodrome Flight Information Service Officer and a report from the appropriate ATC authority.

A very experienced pilot Member commented that many of the small GA aerodromes around the periphery or within the confines of the London CTR boundary - such as Denham - have special rules for visiting ac joining their visual cct which enables them to operate safely in the very confined airspace available to them and also coexist in harmony with the local inhabitants. A controller Member who is also a GA pilot and operates from this aerodrome opined that this is one of the "tightest" ccts in southern England and he stressed that strict compliance with the promulgated procedures is essential. With Denham aerodrome itself and the majority of the ATZ situated within the boundary of the London CTR, the ATZ is notified as Class A airspace. Therefore, a Local Flying Area (LFA) is established to enable pilots to operate into this aerodrome under VFR following strict procedures.

It was evident from the information promulgated in the UK AIP and reproduced at UKAB Note (2) that helicopters "should" comply with the same procedures as those specified for fixed-wing ac – but this was unless "alternative arrangements" have been made. It was also clear that at this aerodrome either an A/G RADIO operator or a FISO are provided, neither of whom are empowered to issue 'instructions' to pilots in the air. With a FISO on duty this day, the helpful report from ATSI had explained that from the information provided by the FISO the pilot must assess the situation himself, make his own decision as to whether it is safe to proceed into the ATZ and taking account of other cct traffic has to integrate his own ac into the established pattern. The AS355 pilot's report implied to some a lack of understanding on his part of the intrinsic differences between a full aerodrome control service provided by an Air Traffic Controller, who can issue instructions using callsign TOWER; a FISO - as here, using the callsign INFORMATION - and at the other end of the scale an A/G Station using the callsign RADIO. Whilst it might seem odd to have merely a FIS available in Class A airspace, procedures have been established for the safe operation of the aerodrome and a Member commented that if they are complied with it does work well. It was important to recognize here that the Denham FISO only provided 'INFORMATION' about the aerodrome and cct traffic and none of these transmissions to ac in the air should be construed as being an 'instruction'. Transmissions from FISOs are therefore couched in the form of 'advice' or 'requests' and not 'instructions' that demand obligatory compliance. Thus it would appear that the 'request' imparted by the FISO to the AS355 pilot was, according to the latter's report, to join initially via MAPLE CROSS. But this was not mentioned in the FISO's report, although this was in compliance with the promulgated procedure for fixed wing ac which the AIP specified helicopters "should" follow. But "should" is not mandatory and could be termed "strongly advisable" albeit that FISOs could reasonably expect pilots to conform.

The lack of an RT transcript severely limited the ability of the Board to resolve such anomalies over exactly what was said but a join via MAPLE CROSS would have necessitated the AS355 continuing along 'H5' outside the ATZ, northbound to NORTHWOOD and thence via MAPLE CROSS onto a long R BASE LEG for RW24RH. Whilst this might have given the AS355 pilot the impression that the FISO had not understood that he was approaching the aerodrome from the SE, this was clearly the promulgated procedure and for this very 'noise sensitive' area would have been strongly advisable unless the AS355 pilot had an overriding reason for not doing so. Those points stated in his report, in the Board's view, did not seem suitable grounds. Subsequently, it would appear that the FISO 'requested' the AS355 pilot to report DOWNWIND for RW24RH and both the FISO and the TB9 pilot had mentioned this in their accounts, although significantly not the AS355 pilot. A join DOWNWIND for 24RH, whilst it would have necessitated crossing the climb-out to RW24 and entering the RH cct from a crosswind leg, would have enabled the AS355 to sight traffic in the cct on his R or departing, integrate easily into the established traffic pattern formed by the other ac already in the cct and comply with the 'Rules of the Air'. Whereas this was not a promulgated joining procedure, a military pilot Member could see little difficulty with that but another military pilot said it could be construed as the FISO offering an "alternative arrangement". It was not clear if the FISO was empowered to make "alternative arrangements" and the AS355 pilot does not seem from his account to have recalled this transmission. However, as it turned out he did not do this; the helicopter pilot reports that instead he announced in his joining call that he intended to continue inbound from UXBRIDGE COMMON to join left BASE-

LEG for RW24RH. He said he advised what he was going to do twice and perceived that this was agreed by the FISO. Members debated whether the AS355 pilot had indeed sought an “alternative arrangement” himself as his account had suggested. But whether the Denham FISO was empowered to agree to this “alternative arrangement” was not clear. In the Board’s view, whilst a CAT pilot Member believed the procedures to be robust they were evidently not comprehensive as they did not seem to cater for helicopters joining from the London Helicopter routes SE of Denham and other Members believed that a review would be beneficial. Having obtained the aerodrome & cct information, irrespective of whether the FISO “agreed” to the AS355 pilot’s request to join L BASE for RW24 or whether it was an “acknowledgement” of the helicopter pilot’s stated intention, it was solely the AS355 pilot’s responsibility to enter the ATZ safely and then integrate with the traffic already established in the RW24RH cct. The FISO was not empowered to refuse entry into the ATZ nor to decline the AS355 pilot’s request. From his account the helicopter pilot believed joining L BASE was the best course of action, but it was clear that flying direct to the threshold of RW24 was perhaps unwise as it gave him less of an opportunity to sight other circuiting ac and integrate his arrival into the pattern already formed. Compliance with the procedure would, in the view of FOI(H) and, reportedly with the benefit of hindsight, now that of the AS355 pilot, have permitted him to avoid the conflict that developed on FINALS. Moreover, his decision to fly direct toward the threshold for RW24 seemingly denied the AS355 pilot the ability to spot the TB9 turning in from the opposite direction and the helicopter’s arrival ahead of the TB9 subsequently triggered the latter pilot’s GO-AROUND. As it turned out the AS355 pilot had not detected the presence of the TB9 at all until he saw it pass down his helicopter’s starboard side during the GO-AROUND. Again the absence of an RT recording of the Denham frequency did not allow the Board to determine what was actually said by the pilots at the time. The AS355 pilot reports that he had not heard any calls from the TB9 pilot at all before he called FINALS. Whilst it seemed extremely unlikely that the TB9 pilot was not making appropriate cct RT calls, it was not feasible to resolve this anomaly. For whatever reason, it was clear that whilst the TB9 pilot was established in the cct and had seen the AS355 approaching from the S, the latter’s pilot had not seen the TB9 and called FINALS unaware of the aeroplane closing in rapidly from his starboard quarter because he had not integrated his ac’s cct join safely. This was the crux of the issue and the Board concluded that this Airprox had resulted because the AS355 pilot did not join the Denham RW24RH cct in accordance with published procedures and flew into conflict with the TB9 on final approach, which he saw too late.

From his perspective, the TB9 pilot was clearly aware of the approaching helicopter from the outset. He had spotted the AS355 flying directly towards FINALS, had it fully in view and was prepared to avoid it when the AS355 pilot turned in ahead of his ac. As the TB9 pilot said that this was only 30m away at the closest point this suggested to some that safety was not assured. However other Members contended that the TB9 pilot had forestalled any risk of a collision because he was able to take appropriate action and initiate a GO-AROUND. The Board was fairly evenly divided in this issue so the Chairman called for a vote; in the end by a significant majority the Board concluded that no risk of a collision had existed in these circumstances.

The Board was apprehensive over the absence of any defined procedure for helicopters joining the Denham cct from the S via the London Helicopter routes. Whilst it was clearly stated in the UK AIP that “*Circuit joining is achieved by establishing a long base leg and giving a position report at...Maple Cross for right hand circuits*”, this by necessity required helicopters following the London Helicopter routes to fly out of the London CTR via NORTHWOOD and thence to MAPLE CROSS, which, although a helicopter pilot Member opined, was the recognized Denham joining point, it was clearly open to mis-interpretation and required approval from HEATHROW SPECIAL VFR. Notwithstanding that it seemed to some Members that the AS355 pilot might have met all published requirements and made an “alternative arrangement”, the Director was charged with writing to the Denham aerodrome operator to seek a review of procedures, specifically for helicopters joining the Denham cct from the S inbound along the London Helicopter routes.

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

Cause: The AS355 pilot did not join the Denham RW24RH cct in accordance with published procedures and flew into conflict with the TB9 on final approach, which he saw too late.

Degree of Risk: C.

Post Meeting Note: Clarification was sought from ATSI regarding the issues surrounding “*alternative arrangements*” as related to this Airprox. ATSI concluded that a FISO is not empowered to make “*alternative arrangements*”. For ac in the air the extent of the FISO’s remit is the passing of traffic and essential aerodrome information and making requests. Consequently, it does not extend to making an ‘arrangement’ because an

## AIRPROX REPORT No 120/06

'arrangement' could not be made without agreement and neither a FISO nor an A/G Operator can be a party to any agreement or indeed any approval.

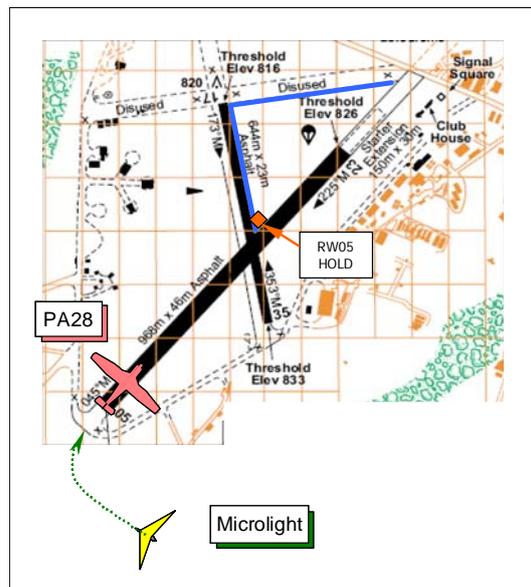
In the context of operations at Denham, the notion of "unless alternative arrangements have been made" means something that has been pre-arranged beforehand and it is clear that such arrangements as may be made are not intended to be 'tactical' in nature. In his letter to the aerodrome operator, the Director will ask that these issues be reviewed and clarified.

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## AIRPROX REPORT NO 120/06

Date/Time: 16 Jul 1330 (Sunday)  
Position: 5051N 00314W (Dunkeswell  
Aerodrome - elev 839ft)  
Airspace: Dunkeswell ATZ (Class: G)  
Reporting Ac Reported Ac  
Type: Pegasus PA28  
Quantum 912 ML  
Operator: Civ Trg Civ Pte  
Alt/FL: 100ft↓ Nil  
QFE (997mb) (aal)  
Weather VMC NR VMC CAVOK  
Visibility: 7km 10+km  
Reported Separation:  
50ft V/10m H NR  
Recorded Separation:  
NR



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

**THE PEGASUS QUANTUM 912 MICROLIGHT PILOT** reports his ML is blue in colour with a white/yellow wing. He was in communication with DUNKESWELL RADIO A/G Station on his dash-mounted radio (operated by headset) whilst inbound after a local sortie in VMC. He was re-joining the cct following an instructional sortie with a student and as the PF had called on RT for "joining instructions": thereafter he had joined on a R BASE-LEG for RW05RH. Whilst on BASE-LEG he called his position on RT and heard the subject PA28 pilot call "backtracking 05". Another ac - a Tiger Moth - was also backtracking and its pilot (whom he knew) said that he would clear at the runway intersection. Upon turning FINAL, heading 050°(M) at 50kt, he again called his position to find the PA28 lining-up to depart on RW05. He opined that the PA28 pilot had not turned to look up the approach and had begun rolling. The ML pilot called again stating his intentions and asked the PA28 to hold but the PA28 then began to roll. The Tiger Moth was still backtracking RW05 and also called. He was now very close - less than 50ft - and began a GO-AROUND in the LIVESIDE. At this point the PA28 pilot aborted his take-off roll. He flew a tight cct pattern and was quite quickly on FINAL again for RW05. [UKAB Note (1): In a subsequent telephone call the ML pilot stated that no DOWNWIND call was made on RT for this second cct.] The PA28 had now backtracked to the threshold for RW05 as he - the ML pilot - called FINAL for RW05. The PA28 now began his take-off roll and took-off despite apparently not looking up the approach and ignoring both of his RT calls.

UKAB Note (2): In a telephone conversation with the UKAB about the Airprox, the ML pilot stated that in his opinion the surface to the SW of the threshold of RW05 [that part not coloured black on the diagram above and within the crosses delineating the disused taxiway] was not technically part of the RW and he was able to land over ac situated there.

**THE PA28 WARRIOR II PILOT** reports his ac is coloured white and the HISLs and landing lamps were all on whilst operating on a local VFR sortie from Dunkeswell before returning to his home aerodrome. His ac was initially parked on the grass behind the pumps at the Aero Club end of RW05. With two passengers on board and following initial start up and pre-flight checks, he made an RT call to DUNKESWELL RADIO A/G Station requesting the airfield information for a local VFR flight. He noted the information and that the runway in use was RW05 with a right hand circuit (RHC). Subsequently, he requested to taxi to RW05 by backtracking along the paved runway surface, which he noted was the procedure adopted by some other ac that day and also one he had executed during a previous visit to the airfield. [UKAB Note (1): Enquiries with the aerodrome concerned confirmed that the normal taxi pattern for RW05RH is to enter and backtrack to the RW intersection and hold clear to the N, off the runway surface.] However, the A/G operator requested that he taxi via the grass taxiway to the hold at the intersection of RW17/35 and thence to 05/23. This was initially a little difficult to identify, but runs E - W adjacent to the S of the disused runway; joins RW17 at its northern end and allows taxiing via RW17 to the intersection - presumably the safer option given the airfield activity at that time. Having taxied to the RW05 hold, he completed his power and take-off checks, then radioed to inform the A/G operator that he was ready for departure. The operator requested him to remain at the hold with one ac on FINALS and another 'in turn'. He waited at the hold for both ac to land - in excess of 5min - then radioed the operator to commence a backtrack along RW05 to the threshold, which was acknowledged with a "take off at my discretion" call. He made an RT call advising that he was 'LINING-UP' on RW 05 as he commenced to backtrack to the threshold. He took a good look out into FINALS that proved clear and had noted no other RT calls from any other ac joining the cct whilst at the hold. Having lined up on the threshold he commenced his take-off run and radioed "[C/S] rolling". Almost immediately, he heard the ML pilot call FINALS for RW05 followed shortly by another call to state that he was directly overhead his ac and appeared to be considering landing on RW05 over the top of him. During this confusion he noted that a Tiger Moth had also commenced a backtrack of RW05 from the Aero Club end and not via the grass as he had been previously requested so to do. The ML pilot then made a very unnecessary radio call to him that was particularly unhelpful given the situation, which he did not acknowledge. He recalls his thought process at the time was: firstly, where had the ML come from? Secondly, whilst he was not visual with the ML as it was above and behind his PA28, the ML pilot had good visibility of the situation himself, was flying a highly manoeuvrable ac and "good airmanship would dictate" that he would simply GO-AROUND thereby avoiding the situation. However given the backtracking Tiger Moth, he elected that the safest course of action was to abort the TAKE-OFF and brought his ac to a stop, having now travelled about 100m from the RW05 threshold. With no further communication from the ML and after taking another good all round look out, he radioed that he was re-commencing his backtrack and returning to the RW05 threshold. On returning to the threshold he again made a good lookout into finals, which again proved clear and he heard no subsequent RT calls from either the A/G Operator, ML pilot or any other ac in the cct. He assumed that the ML pilot must have executed a GO-AROUND and was making another right hand cct, allowing time for the runway to be cleared and for him to re-position and depart. He noted that during the incident there had been no intervention from the A/G Operator. On lining-up it was clear that the Tiger Moth had now fully vacated the runway at the intersection and there was nothing further to conflict: he therefore radioed "C/S rolling" and recommenced his TAKE-OFF run. Shortly after commencing his run, the ML pilot made another RT call that he was back on FINALS and stating that he had allegedly done it to him again! He concluded that the ML pilot, rather than flying a full cct and making subsequent radio calls, must have simply made a low level orbit back onto FINALS for another landing. As there was no obstruction on the runway and again bearing in mind that the ML was a highly manoeuvrable ac with its pilot having the advantage of full visibility of the situation from above and the ability to simply GO-AROUND, he decided that the safest course of action was to continue his departure and get clear of the runway in order to avoid any further potential conflicts. On returning to the airfield later he had discussed the incident with one of the A/G Operators on duty at the time. He also hoped to find the pilot of the ML to further determine the circumstances but to no avail.

UKAB Note (3): In a telephone conversation about the Airprox, the PA28 pilot stated that he had not spotted the ML at all throughout the period of the occurrence nor had he been informed about the ML joining by the A/G Operator.

UKAB Note (4): This Airprox occurred outwith the coverage of recorded radar.

UKAB Note (5): The UK AIP at AD-2-EGTU-1-3 notifies the Dunkeswell ATZ as a radius of 2nm centred on RW05/23, extending from the surface to 2000ft above the aerodrome elevation of 839ft amsl. The ATZ is active in Summer 0830-1700 and an A/G Service is provided. At AD2.22. the cct direction on RW05 is specified as RHD.

UKAB Note (6): The Rules of the Air Regulations 1996, specify:

## AIRPROX REPORT No 120/06

Rules for avoiding aerial collisions

Rule 17

(6) Order of landing

(a) An aircraft while landing or on final approach to land shall have the right-of-way over other aircraft in flight or on the ground...

(7) Landing and take-off

(b) A flying machine...shall not land on a runway at an aerodrome if the runway is not clear of other aircraft unless, in the case of an aerodrome having an air traffic control unit, that unit otherwise authorises.

Flight within Aerodrome Traffic Zones

Rule 39

(2) An aircraft shall not fly, take off or land within the aerodrome traffic zone of an aerodrome...unless the commander of the aircraft has...obtained information from the air/ground radio station at that aerodrome to enable the flight to be conducted with safety.

(3) The commander of an aircraft flying within the aerodrome traffic zone...shall:

(a) cause a continuous watch to be maintained on the appropriate radio frequency notified for communications at the aerodrome or, if this is not possible, cause a watch to be kept for such instructions as may be issued by visual means;

(b) where the aircraft is fitted with means of communication by radio with the ground, communicate his position and height to the air traffic control unit, the aerodrome flight information service unit or the air/ground radio station at the aerodrome (as the case may be), on entering the zone and immediately prior to leaving it.

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

Information available included reports from the pilots of both ac.

Members were keenly aware that the RT calls transmitted by the pilots and the information given by the A/G Station Operator involved here at this 'uncontrolled aerodrome' would have had a significant influence on their subsequent actions. It was also important to recognise here that the Dunkeswell A/G Operator could only provide scant information about the aerodrome and no transmissions from an A/G Station to a pilot, either in the air or on the ground, should be construed as being an 'instruction'. Furthermore, at aerodromes where only an A/G Station is provided RT recording is not obligatory and in the absence of an RT transcript the Board was unable to resolve what was actually said on RT. This made assessment of the Airprox very difficult as the Board could only go on what the pilots themselves had reported, Members attaching equal weight to the two reports.

When operating in a visual cct without ATC it was essential that pilots not only lookout to see what else is going on but they also monitor each other's RT calls very carefully. From the ML pilot's report it was clear that he had requested "joining instructions" and communicated his position when on a R BASE-LEG for RW05RH. For his part, the PA28 pilot should have been aware of where other ac were in the aerodrome cct from their pilots' RT calls - where made - and from any transmissions made by the A/G Operator. In this regard, the PA28 pilot reports that whilst at the RW05 HOLD he had not noted any other RT calls from any other ac joining the cct. The ML pilot's BASE-LEG join would have reduced the time available for him to assimilate what other pilots were doing on the manoeuvring area as he approached the aerodrome. Whilst such a join clearly obviated the need for a DOWNWIND call it also had the unwelcome effect of denying the PA28 an opportunity to hear that there was a ML in the cct, the PA28 pilot saying that he had not noted any other RT calls from any other ac joining the cct whilst at the RW05 HOLD. The ML pilot reports he made a BASE-LEG call before he heard the PA28 call BACKTRACKING down to the threshold of RW05. Whilst this was his understanding of the chronology, this could not be independently confirmed. This BASE-LEG call should have been heard by the PA28 pilot but it seems that

he had not registered that the ML was in the cct at this point. The ML pilot's reference to the BACKTRACKING call might have been the 'LINING-UP' on RW05 call referred to by the PA28 pilot and with no information from the A/G Operator about the presence of the ML, despite his reported "good look out into FINALS" the Board noted that the PA28 pilot did not see the ML as he turned about at the end of the RW prior to take-off. Significantly, the PA28 reports that he did not see the ML at any point at all. Therefore, still unaware of the ML at this stage and having lined-up and commenced his take-off run after reporting "ROLLING", it was clear from the PA28 pilot's report that the first occasion that he became aware of the ML was when he heard the ML pilot call FINALS for RW05 on RT. He heard the ML pilot state that he was directly overhead his ac and it appeared to the PA28 pilot that the ML pilot was considering landing on RW05, over the top of his ac. As this was occurring, the PA28 pilot reports that he also discovered "during this confusion" that the Tiger Moth was backtracking along RW05, apparently to clear at the intersection. The PA28 pilot therefore rejected his take-off, after rolling about 100m, there being little else that he could do in the circumstances. Members agreed that to take-off knowing there was an ac in close proximity astern would have been very unwise.

There was an anomaly here between the two pilots' reports which, in the absence of an RT recording and transcript Members could not resolve. The anomaly relates to the precise sequence of the RT calls in that the ML pilot said that he had already called FINALS before the PA28 commenced his take-off roll so he then called again stating his intentions, asked the PA28 to hold but the PA28 then "began to roll" i.e. after his request for the PA28 to hold was made. From the PA28 cockpit, its pilot had said that he was rolling before he heard the ML pilot's FINALS call. It was clear to the Members from his report that the ML pilot had asked the PA28 pilot to hold whilst he continued inbound with the intention of landing on RW05 over the top of the PA28. Furthermore, it was also clear from the ML pilot's report that the Tiger Moth was still on the RW albeit with the intention of clearing at the intersection. Fortunately, it seems the added presence of the Tiger Moth convinced the ML pilot that it was unwise to continue with the landing and he elected to GO-AROUND at this point, but he himself says that he was by now very close - less than 50ft away from the PA28 - before he began the GO-AROUND in the liveside.

Turning to another aspect of this Airprox, it was unclear to Members why the PA28 had not recognised that the Tiger Moth was on the RW before he initiated his take-off. The ML pilot reports that an RT call was made by the pilot of the Tiger Moth - which should have been heard by the PA28 pilot - but this it seems might have been after the latter reported rolling and had begun his take-off. It seemed to Members that it would have been more prudent for the Tiger Moth pilot either to have waited until the PA28 took-off or himself taxied via an alternative route. However, Members were surprised that the PA28 pilot had not seen the Tiger Moth before he initiated the take-off, wondering if perhaps it was not possible to achieve a clear view along the full length of the runway.

Although the ML pilot then flew a tight pattern to get back to FINALS expeditiously this was apparently too quick to allow the PA28 pilot to either vacate the RW by taxiing off the manoeuvring area or by launching into the cct. This should have been apparent to the ML pilot as he turned R in the cct but apparently no DOWNWIND call was made on RT for this second cct providing that vital warning to other pilots. Having backtracked again to the RW05 threshold and in the absence of any further communication heard from the ML, the PA28 pilot was clearly unable to spot the ML even after taking another good all round look. But although a small ac it was evidently there to be seen because the ML pilot reports that when again on FINALS for his second attempt at a landing the PA28 took-off in front of him. The PA28 pilot had explained why he had done so but in a pilot Member's view as he could not see where the ML was this was unwise and he should have stayed on the RW.

A very experienced GA pilot Member considered that this whole string of events was indicative of the difficulties that can arise in uncontrolled ccts where good RT discipline and the application of sound airmanship are essential to allow pilots to integrate their flights safely. It was clear to the Board that the crux of all of this revolved around the ML pilot's intention to land whilst the PA28 was on the RW and it seemed that he had continued inbound from the second cct leaving little opportunity for the PA28 to clear the RW. One of the difficulties here it seemed was the constrained manoeuvring area at Dunkeswell and the necessity of having to backtrack down RW05 to the threshold with no other taxiing options. Notwithstanding that Rule 17 (6) (a) gives the pilot of an ac landing or on final approach to land the right-of-way over other ac on the ground - in this case the ML - if the pilot on the ground is not aware of that ac - as perhaps the PA28 pilot should have been from the RT transmissions given - then he cannot do so. But it was plain that the ML pilot was intending to land over the PA28 by asking its pilot to hold on the RW in the first instance, much to the concern of the latter's pilot. Despite the manoeuvrability of the ML pilot's machine and his contention that he was allowed to do this, Rule 17 (7) b to the 'Rules of the Air' does not allow a pilot to land on the RW at an aerodrome where there is no ATC when the RW is occupied by another ac. Therefore,

## AIRPROX REPORT No 064/06

the Board concluded unanimously that this Airprox had resulted because the ML pilot attempted to land over the PA28 causing both pilots concern.

In consideration of the inherent risk of collision, it was clear that as he had not sighted the ML at all the PA28 pilot had little or no awareness of what the ML pilot was attempting to do. Having chosen to fly so close to the PA28 it was the ML pilot that chose the separation distance here. Only he could see how close he was to the PA28. However, it was plain that the sensible option was to GO-AROUND, which is exactly what the ML pilot did from his first approach. The Board was conscious that in his highly maneuverable machine this was readily achievable and in so doing the Members concluded that by their respective actions – the ML executing a go-around from his first approach and the PA28 pilot rejecting his take off - both pilots ensured that safety was not compromised.

### PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Microlight pilot attempted to land over the PA28 causing both pilots concern.

Degree of Risk: C.

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## SECTION 4 - AIRSPACE INFRINGEMENTS

Infringements caused by aircraft entering airspace without obtaining clearance continue to occur. Much of this is down to planning but it is also essential that the maps and charts are up to date and, if you use electronic mapping, that the up to date files have been correctly loaded. The Airprox below is just one example of those incidents resulting in Airprox: there are many more infringements that do not reach the Airprox Board.

### AIRPROX REPORT NO 064/06

Date/Time: 1 Jun 1446

Position: 5123N 00230W (8nm E Bristol - elev 622ft)

Airspace: CTA (Class: D)

Reporter: Bristol APR

First Ac Second Ac

Type: EMB145 DR400

Operator: CAT Civ Pte

Alt/FL: 2500ft 1600ft

(QNH 1028mb) (QNH)

Weather VMC NR VMC CLBC

Visibility: 10km 9km

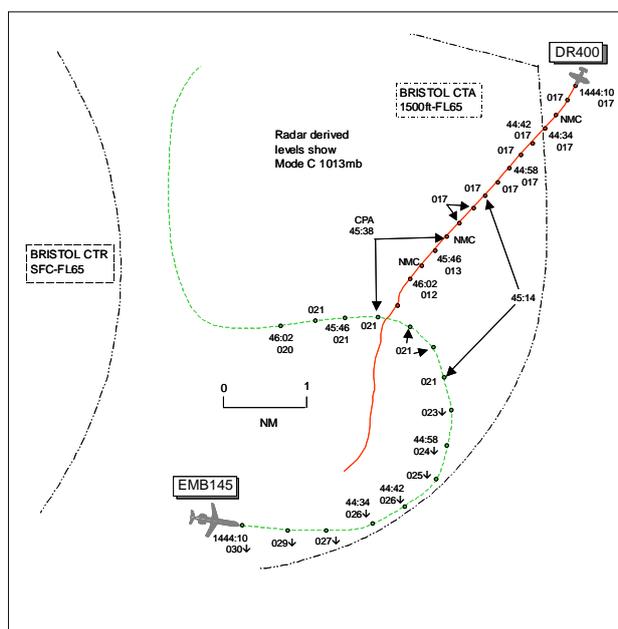
Reported Separation:

APR 500ft V/2nm H

NR 800ft V/3nm H

Recorded Separation:

1.3nm H



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

THE BRISTOL APR reports that the EMB145 was being vectored inside Bristol CAS for an ILS to RW27. When it was established on L base at 2500ft altitude, an unknown contact squawking 7000 with a Mode C readout of 2000ft altitude was observed to enter Bristol CAS from a position 10nm ENE Bristol on a SSW'ly track. The EMB145 was given an avoiding action turn onto heading 270° and the 2 ac were separated by 500ft vertically and 2nm horizontally. The EMB145 was subsequently vectored for an approach from the N. The unknown ac

continued on its SSW'ly track and descended to an indicated altitude of 1600ft as it crossed the extended C/L at range 8nm. Once it was S of Bristol CAS, the unknown ac was seen to climb to an indicated altitude of 2200ft and it was tracked on radar until it faded 25nm SW of Bristol.

The Bristol METAR shows EGGD 1450Z 25012KT CAVOK 17/11 Q1028=

**THE EMB145 PILOT** reports inbound to Bristol IFR. On L base at 2500ft QNH 1028mb and 180kt for a radar vectored ILS approach to RW27, a light ac infringed CAS at 2000ft. Avoiding vectors were issued and the flight was vectored around for an uneventful ILS to RW27. No TCAS messages were received throughout the incident.

**THE DR400 PILOT** reports flying solo from Sibson to Exeter VFR delivering the ac for maintenance. He was informed about the Airprox some 2 weeks post incident by RAC Mil. Prior to this flight he had been deliberately flying longer trips. As this was the longest flight he had ever flown, he decided to break the flight into 2 legs via Kemble to avoid fatigue. At the time of the Airprox he believed he was in communication with Kemble squawking 7000 with Mode C. The visibility was 9km flying 2000ft below cloud in VMC and the ac was coloured white/red with strobe and nav lights switched on. After departing Kemble at 1515 local time, he routed W of restricted area R105 only realising later that this relates to helicopters and microlights. Having planned to route via Bath he heard that there was gliding and parachuting close to his proposed track so he decided to fly beneath the Bristol CTA at 1300ft QNH. Shortly after crossing the CTA boundary heading 180° at 95kt he experienced sudden severe turbulence and, as a consequence, he gained 300ft, he thought. Despite wearing seatbelts with a shoulder harness his head hit the roof of the cockpit sustaining a head injury (photo of head wound supplied). In a slightly dazed state it took him some time to realise that his height had increased and that he had infringed Bristol airspace. It was at this point he noticed an airliner about 3nm ahead on a W'ly heading and 800ft above so he descended quickly to 1300ft and the airliner passed well above whilst continuing on its heading. He thought there was no risk of collision. Later he realised that he should have been speaking to Bristol and gave sincere apologies for not doing so. The rest of the flight was uneventful, landing at Exeter at 1625 local time. Upon arrival his friends commented on his head injury, not realising himself the severity of the impact until seeing the photo. Some valuable lessons have been learnt following the incident – the importance of being in communication at all times and the need to observe and maintain height particularly when transiting close to Class D airspace.

UKAB Note (1): During a subsequent telephone conversation with the UKAB Secretariat, the anomaly between the DR400's indicated level and the reported cruising altitude was discussed. The Cleve Hill radar recording clearly shows the DR400's Mode C steady at FL013 as the flight approaches the CTA from the NE. When about 3nm NNW of Bath with about 2.5nm to run to the CTA boundary, the Mode C rapidly changes, increasing 400ft in 2 radar sweeps (16sec) which is maintained until the Airprox occurs. The DR400 pilot recalled that this position was almost certainly where the turbulence was encountered (near the Southern end of a finger of high ground) but was uncertain as to why his displayed level (actual altitude), prior to the level deviation owing to turbulence and post Airprox, was much higher, as he was flying at 1300ft indicated on the altimeter. He had not obtained or set a regional QNH but then could not remember setting the Kemble aerodrome elevation on the altimeter (QNH pressure setting on subscale) and concluded that he had left QFE set on the subscale on his departure from Kemble. The Kemble aerodrome elevation is 433ft which is equivalent to 14mb, a subscale setting of about 1015mb (actual QNH 1029mb –14mb). The Mode C readout of FL013 equates to 1360ft on a subscale setting of Kemble QFE 1015mb but an actual altitude of 1800ft QNH.

**ATSI** reports that the EMB145 was being vectored inside Bristol CAS for an ILS approach to RW27 descending to altitude 2500ft. The Bristol APR was vectoring a sequence of ac onto the ILS for RW27 and had told the EMB145 that the radar cct would take the ac into a LH orbit for RW27. Correct radar service was applied throughout the vectoring and the EMB145 was told that the vectors would keep the ac inside CAS and clear of a couple of unknowns. At 1443:33 an unknown ac, the DR400, squawking A7000, is NE of the EMB145 by 8nm indicating FL017. At this point the DR400 is outside the Bristol CTA, base 1500ft, but on a track that would cause it to penetrate CAS.

At 1444:31 the APR transmitted *“EMB145 c/s continue the left turn heading three six zero degrees descend to altitude two thousand five hundred feet”*. The pilot acknowledged with the correct read back. Meanwhile at 1444:34 the DR400 entered the Bristol CTA still squawking A7000 indicating FL017; the DR400 is 5.7nm NE of the EMB145. The Bristol QNH was 1029mb, prior to 1450Z, which would give an altitude of, approximately, plus 500ft on all the FLs which are used in the report to reflect the actual radar recording.

## AIRPROX REPORT No 064/06

At 1444:43 the APR transmitted *“EMB145 c/s to keep you inside controlled airspace there is unknown traffic north by er four miles indicating two thousand feet er I may have to turn you again ???? ???? (one or two unintelligible words) he’s about to penetrate controlled airspace”*. The pilot responded *“roger er traffic on TCAS EMB145 c/s”*. At 1445:00 the APR transmitted *“EMB145 c/s avoiding action turn left heading two seven zero degrees”*. The pilot responded with a correct read back. By now the DR400, tracking SW’ly, is 3.5nm in the EMB145’s 1 o’clock at FL017 and has already penetrated the CTA. As the avoiding action is being given by the APR the EMB145 is indicating FL024. Shortly after this the radar recording at 1445:14 shows the DR400 is in the EMB145’s 1 o’clock at 2.3nm, the EMB145 is indicating FL021 and the DR400 FL017.

The closest point of approach occurs at 1445:38 when the EMB145 is firmly established on the 270° heading following the avoiding action turn. The EMB145 is indicating FL021 but there is no height information from the DR400 which is in the EMB145’s 4 o’clock at 1.3nm. At 1445:40 the APR transmitted *“EMB145 c/s apologies for this the unknown traffic now four o’clock range of one mile ???? ???? (one or two unintelligible words) two thousand feet unauthorised entry infringed controlled airspace I’m going to have to take you around again and around him”*. The pilot replied *“Roger EMB145 c/s”*.

[UKAB Note (2): After the CPA, as the horizontal separation increases, the next radar sweep at 1445:46 reveals the DR400 at FL013 (c1800ft QNH 1029mb). After showing NMC 8 sec later, the radar sweep at 1446:02 shows the DR400 indicating FL012 (c1700ft QNH) which is maintained until the DR400 is seen to cross the boundary of the Bristol CTA at 1448:19.]

The EMB145 was repositioned into a RH cct and landed without further incident.

When providing a radar service in Class D Airspace MATS Part1, Section 1 Chapter 5 Page 13, Para. 14. states:

If radar derived, or other information, indicates that an aircraft is lost, has experienced radio failure or is making an unauthorised penetration of the airspace – avoiding action shall be given and traffic information shall be passed. On seeing the CAS infringement and resulting loss in required separation, the APR gave immediate avoiding action by turning the EMB145 away from the unknown target. No ATC causal factors were disclosed.

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

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

Members could add little to the incident investigation reports. The DR400 pilot had not assimilated his true altitude prior to attempting to fly under the CTA and the situation was exacerbated further when sudden turbulence caused his ac to climb about 300ft which went unnoticed for some time by the pilot owing to his dazed state. The Bristol APR had continued to vector the EMB145 in the radar pattern towards the ILS LLZ cognisant of the DR400 approaching the CTA from the NE at a level that could potentially penetrate CAS. The DR400 pilot then entered the Bristol CTA without clearance resulting in a conflict with the EMB145 which had caused the Airprox. On seeing the DR400 crossing the CTA boundary, the APR had taken action immediately and given the EMB145 crew TI and then an avoiding action L turn onto 270° which had quickly resolved the conflict. The EMB145 crew had reported seeing the DR400 on TCAS, following the ATC instructions to maintain 2500ft altitude, the radar recording showing separation of 1.3nm at the CPA. At about the same time, the DR400 pilot had noticed his level excursion and immediately commenced descent to vacate CAS simultaneously with seeing the EMB145 as it crossed his ac’s nose, he thought 3nm ahead and 800ft above. The recorded radar shows the DR400’s descent in accordance with its pilot’s reported actions, the ac levelling at FL012 (c1700ft QNH). The good situational awareness and prompt actions of the APR when combined with the EMB145 and DR400 crews’ subsequent ‘sightings’ and actions 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 DR400 pilot entered the Bristol CTA without clearance resulting in a conflict with the EMB145 which was resolved by the Bristol APR.

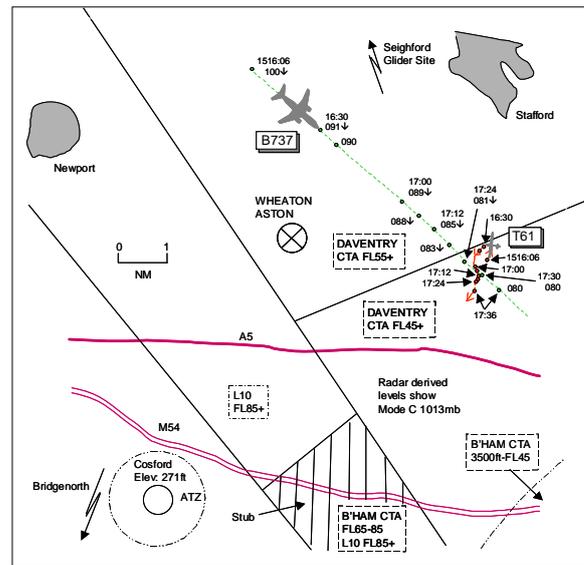
Degree of Risk: C.

## SECTION 5 - INCIDENTS RELATED TO PRE-FLIGHT PLANNING

I have selected two incidents to highlight differing planning problems. In the first, the pilot elected to carry out a flight at relatively high altitude without calling anyone. The aircraft ended up penetrating Class A airspace as well. Make sure your transponder is on or, if you do not have one, it would be good practice to call an ATC unit and discuss your intentions before take-off. Above FL50, there is a lot of IFR traffic routing through Class G, usually where airways do not exist, and if you are operating at higher levels, you may cause problems. In the second I have highlighted a problem during an annual flypast event where it was assumed the Stapleford ATZ would be avoided by fast jet traffic. In practice this is very difficult to achieve and we should not plan to get close to formations of fast jets, even in good weather, as they have limited manoeuvrability and reduced lookout. It is preferable either to keep well away or not fly for the small amount of time involved.

### AIRPROX REPORT NO 048/06

Date/Time: 22 Apr 1517 (Saturday)  
Position: 5243N 00207W (5nm S Stafford)  
Airspace: Daventry CTA (Class: A)  
Reporting Ac Reported Ac  
Type: B737-300 Slingsby T61  
 M/Glider  
Operator: CAT Civ Club  
Alt/FL: FL80 8000ft  
 (RPS 1009mb)  
Weather VMC NR VMC CAVK  
Visibility: >10km NR  
Reported Separation:  
 200-300ft V/100m H Not seen  
Recorded Separation:  
 c0.2nm H



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

**THE B737 PILOT** reports heading 150° at 250kt inbound to Birmingham IFR and in receipt of a RCS from Birmingham Radar on 118.05MHz, he thought, squawking an assigned code with Mode C. About 20nm S of Crewe level at FL80 on an intermediate descent, the Captain just happened to look out from his LH window and spotted a motor glider (M/Glider) in his 10 o'clock range 500m 200-300ft above flying straight and level on a crossing track. No TCAS TA or RA alerts/warnings were received. The white/blue coloured M/Glider passed virtually above and could be seen through the RH eyebrow window as it crossed just ahead. No avoiding action was taken as a collision was not likely but he assessed the risk as high. He informed Birmingham ATC of the incident and spoke to the Watch Supervisor after landing.

**THE SLINGSBY T61 M/GLIDER PILOT** reports departing from Cosford at 1330Z on a non-radio VFR solo flight, intending to operate to the W in the Bridgenorth area, climbing to 8000ft. The weather was CAVOK and the ac was coloured blue/white; no transponder was fitted to the ac. As it became apparent that there was a line of clouds moving slowly in from the W, he descended to 4000ft and navigated round to the S of Cosford, mindful of the Birmingham Zone and 'stub', before climbing back to 8000ft on the Barnsley RPS which he believed to be 1009mb. He then began operating to the N of Cosford and to the W of Wheaton Aston at varying altitudes between 7000 and 8000ft at 80kt before descending to approximately 4000ft to operate to the W of Seighford. He then returned to an area around Newport but because his intention was to head back to Cosford into sun, he headed towards Wheaton Aston climbing above the haze layer to 8000ft before descending below 6000ft as he crossed the A5 road before approaching the 'stub' and continuing to Cosford. He was unaware of any 'Airprox' until he was told by Cosford ATC at 1550Z when back on the ground. During the GH phase of the flight he was aware of one light ac some considerable distance to the E but at no stage was he conscious of a large passenger jet in his proximity.

## AIRPROX REPORT No 048/06

He was asked to contact MACC and spoke to a controller but was a little confused by the report, as there was no clear indication of where or when the Airprox occurred.

UKAB Note (1): During a subsequent telephone conversation between the UKAB Secretariat and the T61 pilot, he was apprised of the geometry, location and timing of the Airprox. He was aware of the Birmingham CTA stub to the E of Cosford base level FL65 and the Daventry CTA base level FL45 and FL55. He had planned to operate at all times clear of CAS and thought that he was flying at 8000ft under the airway L10 to the W of Wheaton Aston (about the time of the Airprox) shortly before returning to Cosford.

**THE BIRMINGHAM RADAR 2 CONTROLLER** reports mentoring a trainee when the B737 flight came on his frequency 131.32MHz on handover from RAD1 on 118.05MHz. The B737 was passing through FL84 cleared to FL80 and was given an instruction to turn and descend for the ILS RW15 whilst approaching from the NW. The pilot responded by reporting a M/Glider had just passed 300-400ft above crossing L to R (later confirming it as predominately blue and white in colour on a heading of about 200°). MACC and RAD1 were informed to pass information to an E145 flight approximately 8nm behind also inbound. The E145 crew reported visual with the M/Glider which was tracked as a primary only return routeing SW which disappeared 4nm S of Cosford. This was later identified as the subject Slingsby T61.

UKAB Note (2): Met office archive data shows the Barnsley RPS for 1300-1400Z was 1012mb, 1400-1500Z was 1011mb and 1500-1600Z was 1010mb. A synoptic weather aftercast shows the general situation at 1200Z as high pressure covering the extreme S of the British Isles and low pressure near Iceland feeding a light to moderate SW'ly flow over the Cosford area. The chart for 1500Z shows surface winds to be light to moderate S to SW'ly, surface visibilities around 9km in haze with no significant cloud in the Cosford area.

**ATSI** comments that analysis of the Debden radar recording, the only recorded radar indicating any consistent primary radar returns, shows at 1516:06 a primary only return (believed to be the T61) tracking NNE'ly in the B737's 11 o'clock at 6.3nm as it is passing FL100 and is 27.6nm NW of Birmingham.

The B737 flight, enroute from Belfast to Birmingham, was transferred from Manchester ACC to the Birmingham APR RAD1 at 1516:30 when 26.9nm NW of Birmingham. The APR RAD1 descended the B737 to FL80 and transferred the flight to the Birmingham APR RAD2 at 1517:00.

[UKAB Note (3): Between 1516:06 and 1517:00 the primary return is seen to turn L from its NNE'ly track onto SW before steadying on SSE.]

At 1517:12 the primary return is tracking 200° in the B737's 12 o'clock at 1.4nm. At 1517:24, as the B737 crew established contact with Birmingham APR RAD2 and were given a radar heading of 170° and further descent to FL60, the radar shows the B737 was passing FL81 with the primary return in the B737's 1230 position at 0.5nm. Just after 1517:30 the B737 crew replied *"right one seven zero and er for information we've just had a motor glider fly about er three or four hundred feet above us from left to right"*. The report is acknowledged by the Birmingham APR RAD2.

[UKAB Note (4): The CPA is believed to occur at 1517:30 but only the B737 is displayed passing through the trail history of the T61 to its NE. Both ac are displayed on the next radar sweep 6sec later, the T61 is in the B737's 4 o'clock at 0.4nm. Taking into account the T61's speed immediately prior to and post incident, it is estimated that minimum separation was about 0.2nm with the T61 to the SW of the B737.]

Although a primary radar return was observed on the Birmingham radar MATS Part 1 Section1, Chapter 5, Page 13, Paragraph 14.2 states the actions to be taken by controllers to avoid unknown ac when operating in Class A or D airspace: *"If radar derived, or other information, indicates that an aircraft is lost, has experienced radio failure or is making an unauthorised penetration of the airspace – avoiding action shall be given and traffic information shall be passed."*

At the time of this Airprox there was no radar derived (e.g. SSR) or other information to indicate that unauthorised penetration of the airspace had occurred and accordingly the Birmingham APR RAD2 was entitled to ignore the primary radar return. No ATC errors disclosed.

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

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

It was noted that this was an unusual flight for a Motor Glider to perform - high altitude GH - and that the incident occurred towards the end of a long sortie. Having planned to operate up to 8000ft to the W and SW of Cosford, near Bridgenorth, with few airspace constraints (CAS base level FL145), the pilot had elected to move to the N and NE of Cosford owing to approaching cloud. Although he had reported being cognisant of the airspace structure in the revised area of operation, careful attention should have been paid to establishing his exact position whilst carrying out GH to ensure that his ac was clear of CAS at all times, particularly where promulgated base levels were below his operating level. It was clear to Members that this was not done and that the T61 pilot operated within Class A airspace and flew into conflict with the B737 which he did not see. This had caused the Airprox.

Members agreed that ATC had acted appropriately and could not have been expected to take any action when the T61 primary-only return was seen within the confines of the Daventry CTA. As it was unknown traffic to Birmingham ATC, the controller had quite rightly assumed it to be flying below CAS. The T61 pilot had ample opportunity to see the B737 approaching from the NW during his manoeuvring but had turned almost tail-on to the airliner, onto a crossing flight path which eventually led to the B737 passing behind, unnoticed. The B737 crew were undoubtedly surprised to see the M/Glider, albeit late, at close range (500m) and 200-300ft above in Class A CAS but fortunately in enough time to assess that an actual risk of collision was unlikely. However, without the benefit of any other safety nets (STCA, TCAS), the Board agreed that the subject ac had passed in sufficiently close proximity, unsighted by the T61 pilot whilst manoeuvring within CAS unknown to ATC, to conclude that safety had not been assured during the encounter.

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

Cause: The Slingsby T61 M/Glider pilot operated within Class A airspace without clearance and flew into conflict with the B737 which he did not see.

Degree of Risk: B.

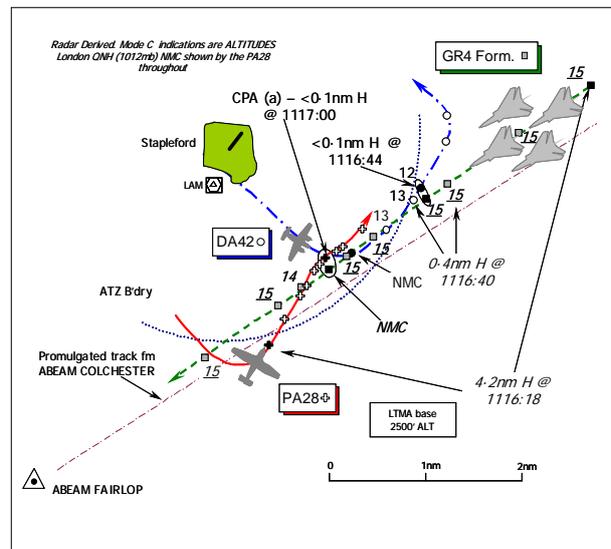
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# AIRPROX REPORT No 143/06

## AIRPROX REPORT NO 143/06

Date/Time: 17 Sep 1117 (Sunday)  
Position: 5138N 00011E (1.6nm SE of Stapleford  
A/D elev: 185ft)  
Airspace: Stapleford ATZ (Class: G)  
Reporting Ac Reported Ac  
Type: Tornado GR4 PA28  
Operator: HQ STC Civ Club  
Alt/FL: 1420ft á1500ft  
QNH (1012mb) QNH (1012mb)  
Weather VMC In Haze VMC In Haze  
Visibility: 6km 6km  
Reported Separation:  
<30ft V/50m H 300ft V/100m H  
Recorded Separation:  
<0.1nm (200yd)



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

**THE TORNADO GR4 PILOT** reports that he was leading a formation of 4 camouflage-grey GR4 Tornado ac in support of an HQ 1GP task for the 'Battle of Britain' commemoration flypast at Westminster Abbey on Sunday, 17 September 2006. He stressed that careful co-ordination had been effected through Airspace Utilisation Section (AUS) at DAP.

[UKAB Note (1): Under Activity No 2006-09-0223, AUS had promulgated an Airspace Co-ordination Notice (ACN), dated 1 September 2006, for this flight which was originally planned to be a 9-ac formation.]

The established route for the 'BOX 4' formation was via a hold at Southwold routing to a point ABEAM COLCHESTER – ABEAM FAIRLOP STATION – thence to WESTMINSTER ABBEY. Weather was within limits for the sortie and they were flying in VMC some 500ft below and 10km+ clear of cloud with an in-flight visibility of 6km with slight haze. A RIS was provided by THAMES RADAR at LTCC on 128.025MHz and they were squawking A7050 with Mode C on. White HISLs and navigation lights were on; neither Mode S, TCAS nor any other form of CWS is fitted.

Flying in level cruise at an altitude of 1500ft London QNH (1012mb) whilst approaching a position 51°37.949'N 000°11.228'E heading 234°(T) at 282kt, numerous traffic information calls were received from THAMES. At 1115:49, THAMES reported one ac 5nm away in his 11 o'clock NE bound at 1800ft and then two ac in their 12 o'clock at 8nm range, one at 1300ft unverified Mode C and a second with no height readout [respectively the DA42 and the subject PA28]. A further call was received at 1116:24, when the other ac [the subject PA28] was at 3nm NE bound 200ft below them. Moments later at about 1116:30, his R wingman saw the light ac – coloured white with red trim – 200m away and called for the formation to descend. He as the formation leader immediately rolled L with 10° AOB and descended about 20ft as the light ac passed 50m down the right side of the formation with no more than 30ft of vertical separation and a "very high" risk of collision. Entry into CAS for the flypast was subsequently executed without further incident.

**THE PA28 PILOT**, a flying Instructor, reports his ac has a red/white colour-scheme and the HISLs were on whilst flying a local solo sortie from Stapleford. He was in communication with Stapleford A/G Station on 122.8MHz and a squawk of A7000 was selected with Mode C on, he thought. [UKAB Note (2): NMC was evident from the PA28 throughout the period of the Airprox.]

At the time of the Airprox he was heading 040°(M) at 80kt, climbing through 1500ft QNH (1012mb) DOWNWIND in the LH cct for RW22L, to position on the DEADSIDE (N of the aerodrome) to remain clear of the Tornado formation. He saw 3 [of the 4] camouflaged Tornados pass 300ft beneath his ac 100m to starboard, flying in the

opposite direction with a “*high*” risk of a collision. No avoiding action was taken as there was “*no time to react*”. Stressing that the Tornados flew through the DOWNWIND leg in the opposite direction at about cct altitude [1200ft], he added that the cct was busy.

UKAB Note (3): In a subsequent telephone conversation with UKAB staff, the PA28 pilot expressed surprise that the Tornado formation had routed so close to Stapleford as he had expected their track to be several miles to the SE and certainly clear of the DOWNWIND leg and the ATZ. He stressed it was very difficult to see the camouflage grey Tornado jets in the prevailing 6km visibility because of the haze – he had no recollection of any appreciable cloud.

**THE DA42 PILOT** also helpfully provided a report stating that he was inbound to Stapleford VFR and in communication with Stapleford A/G Station. HISLs were on and a squawk of A7000 was selected with Mode C. He believed that from the promulgated information the Tornado GR4 formation would pass to the E of Stapleford cct at 1500-2000ft. Furthermore, he understood that the formation flight would be cancelled if the cloudbase was below 1500ft and the stipulated visibility limit. On returning to the aerodrome it was established that the formation was not in the cct area and therefore he proceeded to fly to the DOWNWIND position - ahead of the PA28 in the cct - flying some 300ft below and 10km+ clear of cloud with an in-flight visibility of 5km. When established DOWNWIND at 1300ft QNH, heading 040° at 120kt, he spotted 4 ac ½nm away converging on his ac at the same altitude and flying the wrong way through the active RW22L cct. To avoid the formation he immediately initiated a rapid descent and the formation passed 300ft directly overhead with a “*medium*” risk of a collision.

UKAB Note (4): In a subsequent telephone conversation with UKAB staff, the DA42 pilot opined that previously TRA's had been established for such evolutions, which had been complied with. In his view it was not difficult to arrange a short closed flying period and seemed the safest option.

UKAB Note (5): ACN 2006-09-0223 dated 1 September 06 promulgated under *CO-ORDINATION ARRANGEMENTS* at para 12:

Adjacent Airspace Users

a. Airfields, gliding sites and microlight sites adjacent to the flypast route have been advised of the formation flypast by means of this ACN and NOTAM action. All such organisations are requested to brief their airfield operators and club members on this activity and to suggest that the formation route is safely avoided by at least 2½nm either side of track.

The... and CFI of the Stapleford Flight Centre at Stapleford Aerodrome...have all been

advised of the route and timings of the formation passing adjacent to their airfields by means of this ACN. All are requested that they brief their club members and publicise the event with all airfield operators in order that this activity can be safely avoided.

At WEATHER CHECKING AND LIMITATIONS it is stated at para 14:

a. The full flypast will be cancelled if the significant cloud base is less than 2,000ft amsl and the visibility is less than 5km.

Stapleford Flight Centre ATC was included as an addressee on the distribution of this ACN.

UKAB Note (6): Meteorological Office archive data gives the following as the respective airport METARS for the period:

LONDON City:

1050Z 25004kt 190V290 8000 FEW022 20/14 Q1012

1120Z 23004kt 170V270 8000 FEW022 20/14 Q1012

LONDON (Heathrow):

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1050Z 28007kt 240V310 CAVOK 20/14 Q1012 NOSIG

1120Z 23007kt 180V280 CAVOK 21/14 Q1012 NOSIG

LONDON (Stansted):

1050Z 24005kt 190V280 6000 FEW024 19/14 Q1012

1120Z 24005kt 7000 FEW020 SCT026 20/15 Q1012

UKAB Note (7): A NOTAM was issued by AUS for this Activity – promulgated by AIS as H3362 - that included the following detail:

CEREMONIAL FLYPAST 5130N 00008W (WESTMINSTER ABBEY ñ LONDON) BY 9X TORNADO ACFT.ÖSOUTHWOLD - DEP APRX 1103HRS AT 3000FT DESCENDING TO 1500FT AMSL - 5153N 00049E (ABM COLCHESTER APRX 1111HRS) - 5136N 00006E (ABM FAIRLOP APRX 1118HRS 1500FT AMSL)- 5130N 00008W (WESTMINSTER ABBEY 1120HRS)Ö.NON-PARTICIPANTS ARE REQUESTED TO AVOID THE FORMATION ROUTE BY 2NM EITHER SIDE OF TRACK.

**LTCC ATCI** reports that as no mention of this incident was made on the RT at the time, the THAMES RADAR controller was unaware that an Airprox had taken place and consequently no report was submitted by the controller. This Airprox occurred between ac flying under VFR and the THAMES RADAR controller fulfilled the obligations of a RIS by passing timely and accurate traffic information to the formation.

**ATSI** reports that the Tornado GR4 formation called the THAMES RADAR controller at 1114, and after two-way communication was established the controller instructed the formation to squawk A7050. This was acknowledged and the formation reported: "...23 miles inbound...". Analysis of the radar recording shows the formation was 8.5nm NE of Stapleford indicating 1500ft Mode C. The controller advised the formation that they were cleared for the flypast 1500ft VFR and Special VFR and shortly afterwards the formation reported at 1400ft "...good Victor Mike".

Although a discrete squawk had been allocated, the Thames Radar controller did not inform the pilot that the formation was identified nor did he pass their position as is required by MATS Part 1, Section 1, Chapter 5, page 9, Table 5. The controller then placed the formation under a Limited RIS as it continued on its southwesterly track. (ATSI note: *Both the TOI and the ACN state that ATC will endeavour to provide a RIS but this is not assured. Similarly, crews are reminded that the RIS may well be limited*). Traffic information was passed on one unknown ac NE bound and also on two ac [a DA42 and the subject PA28] which were SE bound, but with no height information. [UKAB Note (7): the LTCC Unit report reflects that at 1115:36, the Tornado leader reported maintaining 1400 feet in good VMC to which THAMES RADAR replied "...limited radar information service, there is unknown traffic left 11 o'clock 5 miles NE bound at 1800 feet unverified. Two further contacts, 12 o'clock range 8 miles, SE bound, one indicating 1300 feet unverified, the other one with no height. The Tornado Leader replied "looking". At 1116:20, this traffic information was updated to "...previously mentioned traffic 12 o'clock range of 3 miles northeast bound indicating 200 feet below". These ac – the DA42 and the subject PA28 - were operating within the left hand cct for RW22L at Stapleford aerodrome. The formation continued to close on the first contact - the DA42 - and passed 'starboard to starboard' at a range of 0.1nm [~200yd] [in a position 2.1nm ESE of Stapleford aerodrome]. The formation continued and passed the second ac - the subject PA28 - also 'starboard to starboard' at a range of 0.1nm [~200yd] 1.6nm SE of Stapleford.

Although the requirements for identifying the formation were not followed, the THAMES RADAR controller provided timely traffic information as required under a Limited RIS. The formation made no reference to an Airprox on RT at the time.

UKAB Note (8): The UK AIP at AD 2-EGSG-1-3 notifies the Stapleford ATZ as a radius of 2nm centred on RW04/22, extending from the surface to 2000ft above the aerodrome elevation of 185ft amsl and active during the period of this Airprox. Stapleford operates an A/G Service – C/S STAPLEFORD RADIO – on 122.8MHz.

UKAB Note (9): The UK Mil AIP at Vol 3 – LFS – TVAA, specifies that Stapleford [CA02] attracts a 2nm avoidance below 2000ft agl.

UKAB Note (10): Analysis of the Stansted 10cm Radar recording shows the GR4 formation as a single corresponding primary & secondary contact only (the individual ac within the formation are not discernable) whilst in transit for the flypast maintaining a level cruise at an altitude of 1500ft verified Mode C London QNH (1012mb) and closing gently on the promulgated track from the R heading directly towards the check point at ABEAM FAIRLOP. Meanwhile, the DA42 is shown overhead Stapleford A/D heading SE before turning L DOWNWIND indicating 1300ft London QNH (1012mb) unverified Mode C. The subject PA28 – the reported ac – is also shown, flying at a radar computed GS of 93kt, having turned L NE'ly from a SE'ly course (as passed in the first transmission of traffic information) outside the ATZ boundary; NMC is shown at all from the PA28 although it is reported as selected 'on'. At 1116:18, the PA28 is in the GR4 formation's L 11:30 position at a range of 4.2nm crossing obliquely from L – R, with the DA42 3nm directly ahead on a reciprocal heading flying at a radar computed GS of 136kt. The formation closes at a radar computed GS of 278kt as the DA42 draws slightly R of the nose at a range of 0.4nm indicating 1300ft unverified Mode C – some 200ft below the indicated altitude of the GR4s. The CPA with the DA42 occurs at 1116:44, just outside the ATZ boundary - with the GR4s 2.1nm from Stapleford - as the DA42 passes <0.1nm on the beam 'starboard to starboard' having descended another 100ft to an indicated altitude of 1200ft unverified Mode C, in conformity with the DA42 pilots reported avoiding action descent. The formation then enters the Stapleford ATZ, maintaining course and level at 1500ft London QNH verified Mode C. The Airprox occurs with the subject PA28 at 51°37'54"N 000°11' 02"E as the latter crosses through the formation's 12 o'clock from L – R, again drawing R until it is shown abeam at 1117:00, at <0.1nm minimum horizontal separation, with the formation 1.6nm from Stapleford. NMC is evident from either the GR4 formation or the PA28, thus the vertical separation cannot be determined at this point. However, the GR4 leader's reported avoiding action descent is shown to an indicated 1400ft verified Mode C on the next sweep, suggesting that if the PA28 was flying at 1500ft QNH the vertical separation was <100ft. The GR4 formation then regain a level cruise at 1500ft, exit the ATZ and achieve the promulgated track on top the check-point at ABEAM FAIRLOP at 1117:46.

**THE TORNADO GR4 PILOT'S STATION** comments that the route flown by the Tornado formation followed precisely that prescribed within the ACN. The route defined in the ACN includes the clipping of the Stapleford ATZ. As such, it enables the formation to minimize over-flying built-up areas to the greatest extent possible and is also necessitated by the lack of manoeuvrability of large formations of aircraft and the requirement to line-up the formation on Westminster Abbey from 'ABEAM FAIRLOP'.

The formation was flying at the datum altitude and well within the vertical bounds promulgated in the ACN. Weather METARs for London City, London Heathrow and London Stansted all give greater than 5km visibility and greater than 2000ft cloud base; the minimum weather requirements for the flypast were observed. The ACN states that "*the full flypast will be cancelled if the significant cloud base is less than 2000ft amsl and the visibility is less than 5km.*" What the ACN does not make clear, which the HQ STC Flypast Operations Orders do make explicit, is that these weather limits are pertinent within the London CTZ. Therefore, the flypast could have continued even if the cloudbase near Stapleford were marginally below 2000ft. The words "*full flypast*" are open to interpretation: does this mean the flypast in its entirety would be cancelled if the cloudbase were below 2000ft or that a flypast by a formation of a reduced size would take place? Notwithstanding the potential confusion created by the wording of the ACN, the pilots of the DA42 and the PA28 should not have assumed that the flypast had been cancelled. The decision to fly to the east of Stapleford by these 2 pilots created the conditions for the Airprox; had they remained 2.5nm clear of the published route, albeit within the Stapleford ATZ, as advised within the ACN, then the conflict would not have arisen. Finally, it is fortunate that the formation was reduced to 4 ac rather than the 9 ac originally planned and published in the ACN as the potential for a collision in this instance would have been considerably greater. In summary, there are lessons to be drawn regarding the wording of the ACN such that no false assumptions are made with respect to routeing or possible cancellations of any such flypasts.

**HQ STC** comments that as part of a flypast over London, the GR4 Leader may have assumed, erroneously, that the ACN conferred more avoidance privileges to his formation than it did. This flypast was not large enough to attract a TRA [now termed a Restricted Area (Temporary) - RA (T)] as other London flypasts do. That said, the route and timing was available to the ac at Stapleford and it is disappointing that there was confusion about where the track went. Also disappointing was the assumption by the Stapleford pilots that the formation would be cancelled due to the weather that, on the day, was within the required limits. The Tornados were going to be abeam Stapleford at that time, on that day. Had the local ac been elsewhere for those few minutes the Airprox may not have occurred.

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

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

The Board was briefed that the lead Tornado GR4 crew had only reported an encounter with one ac, no reference being made within their report of sighting the DA42. Its pilot had however been contacted during tracing action and had provided a helpful account, adding to the Board's overall understanding of the circumstances of this Airprox. Although the DA42's presence could not be overlooked in the analysis of this Airprox, nonetheless the Board could only base its assessment of 'Cause and Risk' upon the PA28 which was the reported ac.

Members were under no illusions as to the difficulties confronting both planners and the fast-jet crews themselves when planning and executing flights such as these through the congested airspace of SE England. An AUS Advisor, who helpfully attended specifically for the assessment of this Airprox, briefed the Board that this route had been used for many years by military formation flypasts over London and this activity differed little from previous events. Furthermore, no special 'protection' was afforded to the formation flypast route. The ACN was relatively 'standard' and the formation was not a large one so neither did the ACN afford any dispensation to relax normal operating practice or specify that the formation might not be able to conform with the normal 'Rules of the Air'. Larger events which attracted participation by a number of ac formations - maybe of dissimilar types - were sometimes afforded a TRA and the Board was briefed that consultation by UKAB staff had revealed a significant level of concern exhibited by all the pilots involved here that no TRA had been established for this event. The Command had mentioned that this flypast was apparently not large enough to attract a TRA - the formation having been reduced from 9 ac to 4 by the Command. The HQ STC Operations Order for the flypast formed the basis upon which the ACN had been formulated. Whereas, the introduction to the ACN stated that "...measures had been agreed by AUS with the organiser and airspace controlling authorities to accommodate the subject Unusual Aerial activity", participating crews reading this might be forgiven if they believed that positive co-ordination had taken place and agreed individually between AUS and all the ATSU's and flying units affected by their task over the whole of their route. But strictly, this "co-ordination" referred to that portion of the flight within CAS. Whilst this might be a common misconception, the Advisor pointed out that for those portions of the activity outside CAS the only co-ordination effected was the dispatch of the ACN to the appropriate unit. Nevertheless, the planning had been for a 9 ac formation which was also promulgated in the NOTAM. It was purely fortuitous that only 4 ac were involved here: had this encounter been with the planned 9-ship formation the outcome might have been much more serious. However, the Board only deals with what actually happened and not what might have occurred in different circumstances.

It had been explained that the flypast route - as plotted from the co-ordinates given for the established points ABEAM COLCHESTER to ABEAM FAIRLOP - tracks through the Stapleford ATZ boundary. The Board was briefed that the ACN accorded the formation no priority status through the ATZ. Moreover, it had been confirmed with Stapleford's management that they had received the ACN and thereby advised of the route and timings of the formation passing adjacent to them. They had been requested to brief flying club members and publicise the event with all airfield operators in order that this activity could be safely avoided - suggesting by at least 2½nm either side of track - yet still this Airprox occurred. The Board was briefed that there was no compunction on GA pilots to comply with this "request", thus only 'good airmanship' could dictate compliance with this sound 'advice'. Nevertheless, following independent consultation with both the PA28 pilot and the DA42 pilot it was explained to the Board that both pilots were cognisant of the intended Tornado flypast and the timings for it but had either expected the formation to remain outside the ATZ - further to the SE of Stapleford - or, in the case of the DA42 pilot, to pass E of the Stapleford cct at 1500-2000ft. The DA42 pilot also thought that the formation flight would be cancelled if the cloudbase was below 1500ft and the stipulated visibility limit - though it was actually specified as: 2000ft amsl and visibility less than 5km. So as the weather had been worse earlier in the morning when the DA42 pilot departed for his training sortie he perceived that the formation flypast would not take place. However, the GR4 pilot's unit had explained that the promulgated weather limits were for flight in the Heathrow CTR so it was incorrect to assume that this applied to the route outside CAS in Class G airspace where this Airprox took place. Some Members thought that in this respect, too much information was promulgated to other airspace users in the NOTAM for if this weather limit had not been mentioned then there would be no reason to suppose that the sortie would not take place, as planned, and that the GR4's would be flying the promulgated route at the scheduled times. A debate ensued about notification to other flying units of the cancellation of events such as these. It was pointed out that the ACN did include at para 16 concise cancellation procedures and various contact telephone numbers

for the LATCC (Mil) Supervisor or the LTTTC Traffic Manager. Thus if there had been any doubt as to whether the flypast was taking place then a call to either of these could have resolved the issue.

The reported PA28 pilot had believed that the formation would remain outside the ATZ further to the SE of Stapleford. This was surprising to some pilot Members who felt that simply plotting the formation's route on a chart would have revealed the proximity of the planned track to Stapleford. The GA pilot Member raised a concern over the way in which AIS promulgates information. In his view, notwithstanding the standard formats for NOTAMs etc, a graphical means of representing such events as this would help GA pilots to absorb and understand such warnings more easily. The AUS Advisor cited production limitations at AUS but the Board was advised that some ACNs do include simple charts for graphical representation. Clearly, although the information was available at Stapleford in the form of an ACN and NOTAM the pertinent information had not been made clear to these two Stapleford-based pilots who – for whatever reason – had not realised that their flights would be so close to this formation and their own aerodrome. Notwithstanding the PA28 pilot's wide crosswind departure outside the ATZ and across the formation's planned track, a controller Member – also an experienced GA pilot himself – opined that it was not unreasonable for these GA pilots here to expect the GR4 formation to stay outside the Stapleford ATZ and other Members agreed. In general, Rule 39 to the 'Rules of the Air' Regulations mandates that civilian pilots communicate with an A/G Station as a prerequisite to entry into an ATZ so that information can be obtained about activity within it to enable the flight to be conducted with safety. From the Tornado formation crew's perspective, under ANO Article 152, military crews are specifically exempt from the major provisions of the ANO and as such compliance with Rule 39 is not obligatory. However, military flying regulations invariably cover such aspects as this within the UK LFS – usually more strictly - which would invariably afford an aerodrome avoidance mirroring the dimensions of an ATZ, thereby affording a measure of 'protection' to this airspace and thus fully within the 'spirit' of the 'Rules of the Air'. This is the case around London in the Thames Valley Avoidance Area of the UK LFS, where the UK AIP at Vol 3 – LFS – TVAA, specifies that Stapleford [CA02] attracts a 2nm avoidance below 2000ft agl. Whilst the ACN specified that TVAA entry "clearance" would be arranged, in the Board's view it did not seem to encompass entry into the Stapleford ATZ, but perhaps the formation's crews may have thought so. It was clear from both the NOTAM and the ACN that the formation was planned to pass abeam Stapleford just before 1118, which was the stated time ABEAM FAIRLOP at the promulgated altitude of 1500ft amsl. However, any deviation R of track below 2185ft amsl – the upper altitude limit of the Stapleford ATZ - would take the formation further into the ATZ and allow them to encroach further toward the DOWNWIND leg for Stapleford's RW22L – as occurred here. Members agreed that it was a mistake to plan this route cutting so close within the ATZ and just because it had been used before was no reason to continue. In this respect it was pointed out that since this Airprox occurred steps have been taken to move the inbound leg slightly further to the S thereby eradicating the problem with Stapleford itself. However, the GR4 lead pilot's Unit report had made it plain that there was a requirement to line-up the formation on Westminster Abbey. Hence the "suggestion" of avoiding the route by 2½nm in the ACN – 2nm in the NOTAM - to afford a 'safe buffer' was indeed a sensible precaution. However, with the formation passing 2nm from the aerodrome, within the ATZ, so strictly within the promulgated 'advice' this effectively precluded ac from departing from Stapleford – especially RH DOWNWIND off RW22L – over the period. Given the nature of the sortie and who was flying it, it seemed axiomatic that the formation would fly past Stapleford on, or very close to, their planned track and pass through the promulgated points at the briefed time. The radar recording had evinced that the GR4s were marginally R of track and closing from the R as they approached ABEAM FAIRLOP, and about 14sec early (given about a 4sec data update rate) on the planned time, so it should have come as no surprise to the DA42 pilot when he first saw the 4 camouflage-grey GR4s ½nm away converging on his ac, at the same altitude he reports, flying the wrong way through the active RW22L cct unannounced. Mention had been made from the civil perspective of the convention for entering an ATZ by radio-fitted ac and Members queried whether one of the GR4 crews could have called on the Stapleford A/G frequency. This would have highlighted to other pilots the presence of the jets and also might have enabled the A/G Operator to pass information about the aerodrome traffic possibly forestalling this close quarters situation. An experienced fast-jet navigator opined this would not have been feasible with a 4ac formation whose crews would have been working very hard listening to Thames RADAR on VHF whilst speaking on UHF to the other formation elements; however, this might be possible with a larger 9ac formation. Despite the lack of any prior warning on RT, fortunately the DA42 pilot had spotted the formation in time to take his own avoiding action but, at a closing speed in the order of 420kt, little time was available to accomplish this before moments later the 4 jet crews passed the DA42 out on their starboard beam, unbeknown to them at the time it would appear. For his part then the DA42 had been able to avoid the jets, but in the Board's view he should not have allowed himself to be placed in this difficult situation. Whether the formation crews had not spotted the DA42 or had discounted it as not a factor was unclear. Nevertheless, moments later the subject PA28 had been spotted by the starboard GR4 wingman out to the

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formations R, who saw the white/red PA28 a mere 200m away and called for the formation to descend, which was indeed timely.

It was noted that the Thames RADAR controller had provided a good flow of traffic information to the formation leader under the RIS. Indeed it was clear from the concise ATSI report that traffic information had been given by RADAR twice about the DA42 and the subject PA28. This should have been ample warning and yet in a controller Member's opinion the formation still pressed on and took no immediate action - however, this was a solitary view and in the opinion of other Members there were few options available. Members were reminded of the difficulties confronting a formation leader aiming to maintain his track and be on time for such an event. So it was entirely fortunate that the leader was able to manoeuvre his unwieldy formation into a gentle banked turn with a slight descent to avoid the PA28 by a wider margin. This pilot reports that he saw 3 of the 4 camouflaged Tornados pass just beneath his ac 100m to starboard, flying in the opposite direction. It was not feasible to ascertain which of the 4 jets the PA28 pilot actually saw nor which one he did not see and it was indeed possible that he might not have seen the jet that flew closest to him but in any event the PA28 pilot said no avoiding action was taken as there was no time available. The Board agreed that this was part of the cause – a late sighting by the PA28 pilot – but questioned why he placed himself in such a position. Notwithstanding his expressed concern that the Tornados had entered the ATZ and flown through the DOWNWIND leg in the opposite direction at about cct altitude through a busy cct, pilot Members stressed that he was aware of the flypast and had precise information beforehand to tell him where it would be and, to the minute, when. Moreover, the PA28 pilot had flown CROSSWIND after departure extending outside the ATZ before turning DOWNWIND across the jets' path so this encounter could as easily have occurred seconds earlier just outside the ATZ - as did that with the DA42 moments beforehand. So it seemed that some pilots had completely disregarded the advice contained in the ACN and the NOTAM, which the PA28 pilot confirms he read. He reports, furthermore, that he was climbing through 1500ft London QNH (1012mb) DOWNWIND in the LH cct for RW22L, to position into the DEADSIDE to the N of the aerodrome to remain clear of the Tornado formations route. But Members recognised that to depart L DOWNWIND knowing that he would be in the vicinity of the jets at the specified altitude for the flypast – the radar recording had shown they had maintained their planned 1500ft QNH - and clearly at the prescribed time was plainly unwise. Notwithstanding the formation's unannounced entry into the ATZ and the choice of the route, the GR4 pilots might reasonably have expected other aviators to exercise good airmanship, take heed of the NOTAM, and safely avoid their formation for a minute or so – for that is all it would have taken. In the Board's view, this was the nub of the issue, Members concluding that despite all the information promulgated in advance of this activity, pilots still chose to ignore the advice contained in the NOTAM. In so doing they hazarded not only their own ac but in this case four fast jets flying in an unwieldy formation that was difficult to manoeuvre around other slower traffic. This in the constrained airspace below the LTMA in the vicinity of the Heathrow CTR made avoidance doubly difficult. After weighing all these many factors carefully, the Board agreed that this Airprox had resulted because the PA28 pilot, whilst trying to avoid a NOTAM'd flypast route, nevertheless flew into conflict with the Tornado GR4 formation which he saw late.

The Board agreed with all the pilots involved that this was a risk-bearing Airprox, but one which seemed entirely preventable. Reporting that he was unable to take any avoiding action himself, the PA28 pilot said there was *"no time to react"*, and it was very difficult to see the camouflage grey Tornado jets in the prevailing visibility because of the haze: clearly, safety was not assured. His account states that the 3 Tornados that he saw passed some 300ft beneath his ac 100m to starboard, flying in the opposite direction with a *"high"* risk of a collision - but where was the fourth jet in relation to the PA28. This was not clear but the PA28 pilot's assessment of the minimum separation was significantly greater than that of the lead GR4 pilot who said that the light ac passed 50m down the right side of the formation with no more than 30ft of vertical separation and a *"very high"* risk of collision and this was after he had taken avoiding action. With the tight 'BOX 4' formation at low-level the radar recording merely reflected one contact for all four ac and given the inherent range discrimination limitations of the recorded radar source it was not feasible to resolve this anomaly other than to record that the minimum horizontal separation was certainly less than 0.1nm when the Airprox occurred with the PA28 1.6nm from Stapleford. As no Mode C was indicated by either the GR4 formation or the PA28 at this moment, the vertical separation could not be independently determined. However, the radar recording showed that the GR4 formation had accurately maintained 1500ft London QNH as they approached ABEAM FAIRLOP and with 1400ft verified Mode C shown on the next sweep after the CPA and the PA28 reporting that he was climbing through 1500ft QNH, the analysis had suggested that the vertical separation was less than 100ft as the 4 jets passed on the beam. However, Members noted that the traffic information provided by Thames RADAR had ensured that the GR4 formation crews were looking for the other ac as they approached the area, thus when his starboard wingman detected the PA28 and called this to the GR4 formation leader he was able to gently manoeuvre the 4 jets by rolling L with 10° AOB, which

was probably as much as the leader could do at low-level, and descend. The irony that this occurred with only 4 Tornados instead of the planned 9 ac GR4 formation was not lost on the Members and it was clear that with a larger formation the outcome could have been very different. However, the Board bases its assessment of Risk on what actually occurred and not what might have happened in different circumstances. Whilst the Stansted radar recording evinced that the GR4 leader's avoiding action was barely taken in time, it was effective in averting a collision even though this was certainly a close call. The Board agreed that the safety of the ac involved had certainly been compromised.

Given the difficulties experienced by the formation and the anomalies revealed during the assessment of this Airprox, Members were concerned that this could, potentially, occur again. It was evident to the Board that despite the advance warning, advice and comprehensive detail about this formation flight within the ACN and the NOTAM, this had all come to nought in preventing a close quarters situation that was almost entirely predictable. There were valuable lessons within this Airprox for the benefit of all concerned and it was important for the aviation community as a whole that these were not lost. During a wide-ranging and comprehensive debate, concern was expressed over the lack of RT communication by the formation with Stapleford, which was intrinsic to safe operation of an aerodrome cct. The methodology for the promulgation of the route was discussed: the GA Member suggested making it easier for GA pilots to assimilate what would occur, possibly by the judicious use of graphics within the ACN. Perhaps pilots could call AIS for information on whether the activity was actually 'on or off'; alternatively, maybe it might be cascaded down through ATSUs. But overarching all these suggestions it was apparent that the pilots involved here believed that a TRA would have been appropriate for this evolution. It appeared that some pilots at Stapleford would have been quite content to have had a short temporary restriction placed upon them to ensure that this event could be conducted with safety. Where, previously, TRAs had been established, this had been accomplished satisfactorily with apparently a minimum of disruption and Members agreed that the judicious application of a Restricted Area (Temporary) - RA (T) had merit. Wishing to ensure that the potential for a recurrence of an Airprox such as this was minimised in the future, the Board was moved to make a Safety Recommendation that: The MOD and CAA should jointly review the arrangements, safety provisions and notification procedures for formation flights in Class G airspace such as these, so as to minimise the risk of a conflict arising between formations of ac and non-participating flights.

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

Cause:The PA28 pilot, whilst trying to avoid a NOTAM'd flypast route, nevertheless flew into conflict with the Tornado GR4 formation, which he saw late.

Degree of Risk: B.

Safety Recommendation: The MOD and CAA should jointly review the arrangements, safety provisions and notification procedures for formation flights in Class G airspace such as these, so as to minimise the risk of a conflict arising between formations of ac and non-participating flights.

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