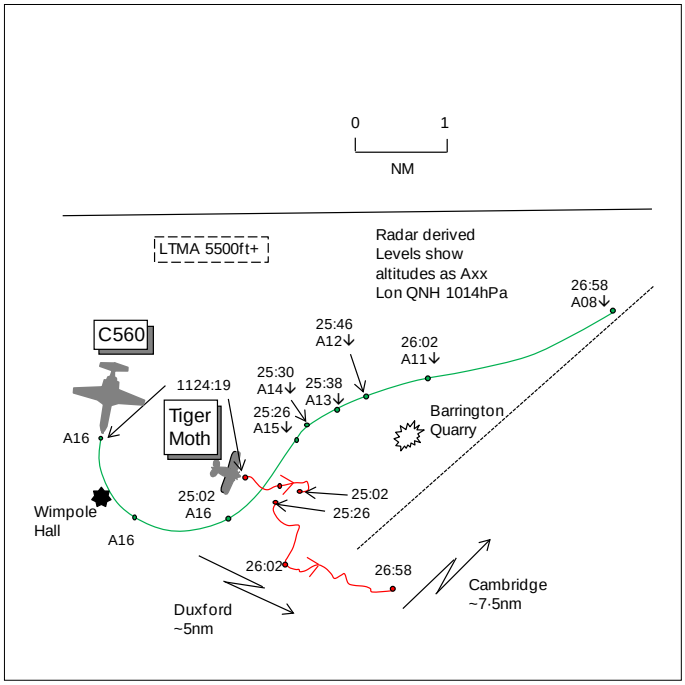
AIRPROX REPORT No 2012063

Date/Time:	6 May 2012 1125Z (Sunday)	
Position:	5208N 00001E (8nm SW Cambridge - elev 47ft)	
Airspace:	LFIR	(*Class: G*)
	Reporting Ac	*Reported Ac*
Type:	C560XLS	Tiger Moth
Operator:	Civ Comm	Civ Trg
Alt/FL:	1600ft QNH (1014hPa)	1500-2000ft↓ QFE
Weather:	VMC CLBC	VMC HAZE
Visibility:	10km	10km
Reported Separation:	Nil V/2-300m H	500ft V
Recorded Separation:	<0·25nm	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE C560XLS PILOT reports inbound to Cambridge under IFR and in receipt of a DS, he thought, from Cambridge Approach, squawking 1416 with Modes S and C. The visibility was 10km flying 1200ft below cloud in VMC and the ac was coloured white; lighting was not reported. Earlier they had been released by London and cleared to leave CAS when descending to 3000ft in order to carry out the NDB/DME approach for RW05. They were informed by Cambridge ATC about many light ac in the vicinity of the aerodrome. They were No 3 for the approach and were able to spot the 2 previous ac visually and a couple of others in the vicinity using TCAS. Flying in the middle of "this great circus", both crew member's eyes were looking outside watching for traffic; the AP was on. Following the procedure NDB/DME RW05 they turned from the outbound radial to join the FAT, level at 1600ft when suddenly they spotted a yellow Tiger Moth flying across the final approach on a converging track at the same level; this traffic was not reported by Cambridge. Even though they didn't receive any TCAS alerts, they disconnected the AP to be ready to react in accordance with SOPs. The Tiger Moth then started to perform a series of loops in front of them still on a converging track with the bottom of the loops at their level (1600ft). Turning through heading 140° at 160kt they increased their rate of turn in order to maintain horizontal separation and started to descend before the FAF to maintain vertical separation. The Tiger Moth passed 200-300m clear at the same level and he assessed the risk of collision as high. They reported the situation to ATC, informing them about the Tiger Moth performing aerobatics in the middle of the instrument approach final without TCAS. ATC replied that they were not informed about the ac and it was not in RT contact with Cambridge. It was difficult to estimate how close the Tiger Moth was but it was close enough to identify the ac type. After landing he had a gentlemanly discussion with the Tiger Moth pilot and informed him that performing aerobatic flight on IFR FAT was maybe not the safest place to do it and the other pilot apologised. The Capt later spoke to ATC who pointed out the problem of Class G airspace and explained, for safety reasons, Cambridge had asked the authorities many times to change from Class G to D but for cost saving consideration it had been refused. This situation brought to light that the Company use many airports in Class G airspace (Cambridge, Oxford, Farnborough plus others) where light ac without TCAS and radio could cross fast jet ac flying an IFR approach. Even if crews are informed of the risk with TCAS 'hotspots' on a feasibility briefing, the speed difference between ac, high density of VFR traffic around those airfields and heavy workload of crews performing an IFR approach in the middle of VFR flights will certainly create a major event one day.

THE TIGER MOTH PILOT reports flying a dual training sortie from Duxford, VFR and not in receipt of an ATS; no transponder was fitted. The visibility was 10km in haze in VMC and the ac was coloured yellow. Returning to Duxford from just S of Wimpole Hall [9nm SW Cambridge] he was out of sight of Cambridge owing to haze. Just about 2-3nm SW of Barrington Quarry [on C/L RW05] descending from 2000ft heading 115° towards Duxford after looking out he elected to demonstrate a loop. While upside down at the top of the loop heading 295° at 40-45kt he saw a fast-moving twin engine ac, which had obviously approached from behind, passing probably >500ft below in the opposite direction, presumably on a long straight-in approach for Cambridge RW05. He assessed there was no risk of collision. After landing he was asked to ring Cambridge ATC and he spoke to the other pilot who stated that he had seen his Tiger Moth in good time and made a slight adjustment to track and that he would not be filing an Airprox. Hence he had not made a record of heights/times/headings at the time and he then went away on holiday, which delayed him replying when requested to complete a report form. He went on to comment that normally he would not be in RT contact with Cambridge owing to the difficulty of communication from an open cockpit while also talking to his student. He suggested that, particularly at weekends, Cambridge should advise Duxford by landline of any inbound commercial traffic likely to make a straight-in approach for RW05, with approximate timings, so that Duxford can advise his company pilots of this before take-off. Also, ac making a straight-in approach to Cambridge from the W and not under radar control could be held higher (>3000ft) until closer to Cambridge to avoid VFR non-radio traffic operating in the 500-2000ft band to the W.

THE CAMBRIDGE APPROACH SUPERVISOR reports acting as the OJTI for an ADC trainee and was in a position to observe/monitor the APP. The C560 proceeded beacon outbound for a procedural NDB approach for RW05. At 1125 whilst outbound the C560 crew observed a yellow Tiger Moth flying aeros and asked whether ATC were aware of the ac, which they were not. When in the base turn onto final at 1600ft the Tiger Moth converged with the C560 whilst inverted. He believed the miss distance was minimal. From the ATM he saw the C560 turn slightly to avoid. The Tiger Moth did not appear to be squawking. After searching they acquired the Tiger Moth visually from the VCR and eventually it was traced to Duxford. The C560 pilot visited the Tower and ATC arranged for the Capt to speak to the Tiger Moth pilot.

ATSI reports that an Airprox was reported by the pilot of a Citation C560XLS (C560) when it came into proximity with a Tiger Moth 8nm SW of Cambridge Airport at approximately 1600ft amsl.

The C560 was under IFR, inbound Cambridge from Cork and was in receipt of a PS from Cambridge Approach on 123·6MHz.

The Tiger Moth was operating VFR on a training flight and was not in receipt of an air traffic service. The Tiger Moth was not transponding Mode A or C.

The Cambridge Approach controller was providing a PS, without the aid of surveillance equipment. Cambridge Airport and its surrounding airspace (from beneath altitude 5500ft) is Class G.

The NDB DME approach for RW05 at Cambridge requires ac to proceed outbound from NDB(L) CAM on QDR 241° (Cat A B) or 246° (Cat C D) descending to not below 1600ft (1565). At I-CMG D8.5 turn L to intercept the FAT not below 1600ft (1565) at I-CMG D5.5. FAT is offset 1·5° R of RW C/L.

ATSI had access to: the reports of both pilots, form SRG1602 from Cambridge ATC, transcription of Cambridge frequency 123·6MHz, recording of Duxford Information frequency 125·9MHz and recorded area surveillance.

Meteorological information for Cambridge was: METAR EGSC 061120Z 06004KT 350V140 9999 SCT028 09/02 Q1014=.

The Tiger Moth departed Duxford at 1106 (UTC). The C560 flight called Cambridge Approach at 1116:10. The ac was descending through 6000ft for altitude 3000ft and was 5nm S of Cambridge inbound to the CAM NDB. The Cambridge Approach controller responded *"…procedural service non radar cleared to the Charlie Alpha Mike at altitude three thousand feet Q N H one zero one four no delay expected".* The C560 crew read back *"Three thousand feet Cambridge er N D B call you er call you ou out outbound er and we have Papa ???? ???? Q N H one zero one four".* The C560 flight was then cleared for, "…*the N D B approach runway zero five,*" and instructed to report outbound.

The C560 passed overhead the CAM at 1117:32. The controller then requested a level report from the C560. The pilot reported passing 3600ft. At 1118:10 the controller instructed the C560 flight, "…*descend with the procedure report base turn complete*."

The C560 then manoeuvred to the NE, maintaining altitude 3000ft, before calling beacon outbound and descending to altitude 1600ft at 1120:30. Surveillance replay shows the C560 pass O/H the CAM in a SW'ly direction at 1121:07 with Mode S SFL indicating 1600ft.

At 1121:07 the Tiger Moth was 9·5nm WSW of Cambridge airport. The Tiger Moth appeared on the surveillance replay as a primary position indication symbol only.

At 1122:40 the controller requested a level report from the C560 and the pilot reported at 1600ft. The Tiger Moth, having flown on a SE'ly track, was now in the C560's 12 o'clock position crossing R to L at a range of 3·7nm. The Tiger Moth's position was approximately 8·5nm from the CAM NDB.

As the C560 levelled at altitude 1600ft 5·7nm outbound, the pilot requested his number in the sequence for final approach. At 1123:10 the controller replied, "…*there's two aircraft in the right hand circuit runway zero five at the moment I believe you're number three in traffic.*" This was acknowledged by the C560 pilot. At this time the Tiger Moth was in the C560's 12 o'clock at 3nm.

At 1124:20 the C560 reported, *"Er we are turning on we're on base turning final and er we have traffic in sight er three hundred feet above us (C560 c/s).*" Additionally, the pilot also reported it as, "…*little yellow airplane*". The C560 was halfway through the base turn: the Tiger Moth was in its 10 o'clock position range 1·7nm tracking SE'ly. The controller informed the C560 pilot that that traffic was not known to ATC.

The C560 pilot then expressed his concern that the C560 was catching the Tiger Moth from underneath and that he, the C560 pilot, hoped the Tiger Moth pilot could hear him. The C560 was completing its base turn and the lateral distance between the 2 ac was decreasing.

At 1125:00 the C560 pilot reported that the Tiger Moth was doing "acrobatics" in front of the C560. The relative positions of the 2 ac are shown in Figure 1 below, with the C560 transponding SSR code 1416.

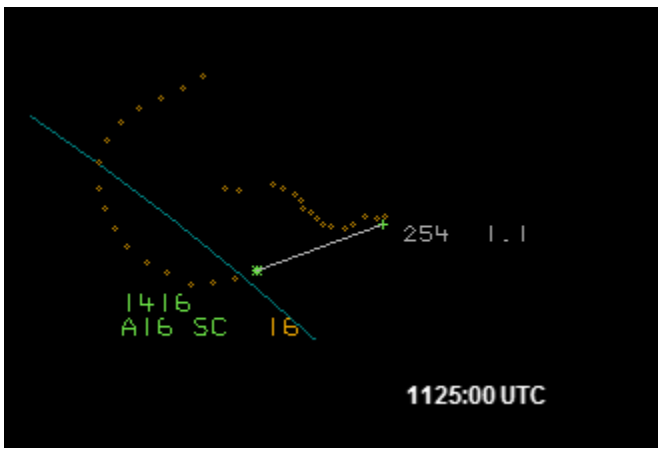


Figure 1

The Tiger Moth's manoeuvres were such that its position could not be resolved by the available surveillance equipment and it disappeared from the surveillance replay at 1125:02. At 1125:20 the C560 pilot reported that the acrobatic manoeuvres and very close position of the Tiger Moth were not very safe.

[UKAB Note (1) The C560 continues on a NE'ly track and commences descent at 1125:26 as the Tiger Moth's primary only track reappears 0·75nm to its SSW tracking SW'ly. The CPA occurs during the Tiger Moth's radar fade period but taking into account the relative speeds it is estimated the ac passed within 0·25nm of each other. The Tiger Moth's primary radar return exhibits severe track jitter; however, it is seen to track generally SE towards Duxford before fading completely at 1126:58 with 4nm to run.]

After eventually visually acquiring the Tiger Moth from the Tower, the controller offered to make enquiries as to its identity.

Between 1125:20 and 1127:00 the surveillance replay showed that the C560 manoeuvred 0·5nm to the L of the FAT before re-establishing on final at 4nm.

The Tiger Moth flight called Duxford Information at 1131 as it rejoined the aerodrome traffic pattern.

The Cambridge Approach controller believed that, and informed the C560 pilot that, the C560 was No 3 in traffic following 2 other known ac operating in the aerodrome traffic pattern. The controller was unaware of the presence of the Tiger Moth.

The C560 pilot may have believed that, prior to the Tiger Moth's manoeuvring, the C560 was following the Tiger Moth in the traffic pattern. The Tiger Moth was flying L to R across the procedural FAT for RW05 at Cambridge. When the C560 pilot realised that the Tiger Moth was not in the traffic pattern, action was taken to manoeuvre the C560 such that it avoided the Tiger Moth.

The final approach for Cambridge RW05 is entirely within Class G uncontrolled airspace where collision avoidance rests ultimately with the pilot of the ac. Under a PS pilots can only expect that a controller may pass TI on ac known to the controller. There was no requirement for the Tiger Moth to be in contact with an ATSU.

The Airprox occurred 8nm SW of Cambridge Airport at approximately 1600ft amsl in Class G uncontrolled airspace when a C560 inbound to Cambridge on the NDB(L) DME RW05 procedure came into proximity with a Tiger Moth, which was unknown to Cambridge ATC.

As the Tiger Moth flew across the procedural FAT for Cambridge RW05, the C560 pilot manoeuvred the ac to avoid the Tiger Moth before re-establishing on final to land.

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.

With this incident occurring in Class G airspace, the pilots of both ac were responsible for maintaining their own separation from other traffic through see and avoid. It was noted that the C560 crew, in their CA1094, reported being in receipt of a DS whereas the Cambridge controller had informed the crew that they were under a "PS, non-radar" in response to their initial call. The level of service was not read back but from the crew's written report, it was clear they were aware of their responsibilities and the need to maintain a good lookout. However, the C560's ETA was within the promulgated hours of 'Radar' being available, and Members were concerned that the flight was not afforded a radar service to assist the crew's SA with respect to unknown traffic. Clearly if Radar is not available, the outage should be NOTAM'd to that effect or the AIP entry should be changed to

reflect the hours of availability. The ATSI Advisor informed Members that this anomaly was the subject of an ATSI Recommendation, following the same service shortfall highlighted in a previous Airprox (2011069); the ATSU, in consultation with the CAA ATSD Southern Regional Inspectorate, was tasked to review the provision and promulgation of the Unit's radar services. Subsequently the AIP entry for 'Director' was amended to 'Available by arrangement subject to traffic' but the entry for 'Radar' remained unchanged. The Chairman was tasked to write to Cambridge ATC to seek clarification of ATSU's service provision.

Post Meeting Note: The ATSI Advisor proffered to follow up the ATSI recommendation with Southern Regional Inspectorate and inform the Board of any progress made.

The C560 was inbound IFR and following the NDB/DME IAP for RW05, not a straight-in approach as thought by the Tiger Moth pilot. This procedure requires the ac to route outbound from the CAM NDB to the WSW descending to 1600ft before turning L at 8.5nm range towards the inbound approach path. Therefore the C560's flight profile was dictated by the IAP so the Tiger Moth pilot's suggestion of inbound traffic remaining high until closer-in, in this case, was untenable. Also Members thought that the Tiger Moth pilot's suggestion of Cambridge informing Duxford the approximate timings of inbound RW05 traffic was unworkable, it being too generic to be useful or warrant further progression. However, pilot Members opined that, subject to Company approval, the C560 crew, although IFR, could have requested a visual approach, if the Wx was suitable, which could allow the flight to remain closer to Cambridge without the need to fly the full IAP. It was during the turn towards final when the C560 crew first saw the Tiger Moth transiting SE'bound through the RW05 FAT, its presence not apparent from their TCAS (no transponder on the Tiger Moth), and its pilot not in RT contact with Cambridge ATSU. Members understood the inherent difficulties with the Tiger Moth pilot (open cockpit) establishing 2-way contact with Cambridge; however, Members agreed with the C560 crew that carrying out aerobatics on the FAT was not best practice/good airmanship. Had the Tiger Moth pilot contacted Cambridge this would have given ATC and the C560 crew the 'heads-up' of his presence and intentions and, conversely, the C560's intentions would have been apparent to the Tiger Moth pilot from the RT exchanges. Irrespective of these elements, Members believed that 'the system' (see and avoid in Class G airspace) had worked. Although the Tiger Moth pilot had not seen the approaching C560 as it approached from behind or when clearing the area visually prior to commencing aerobatics, only acquiring it when inverted at the top of a loop as it passed in the opposite direction 500ft below, it was felt that this was understandable given the geometry of the encounter. The C560 crew visually acquired the Tiger Moth as it crossed from L to R ahead and then took avoiding action on it by increasing their rate of turn to the L when it commenced aerobatics on the FAT, estimating 200-300m separation at the CPA. Taking these elements into account the Board elected to classify this Airprox as a conflict between IFR and VFR traffic close to the RW05 FAT in which the actions taken by the C560 had ensured that any risk of collision had been effectively removed.

Members noted the comments made by the C560 crew with respect to Cambridge ATC requesting a change to the classification of the airspace. Any change is subject to an aerodrome operator or ANSP submitting an application to the CAA taking into account numerous factors and complying with the requirements laid down in CAP724, The Airspace Charter, and submitting an application in accordance with an Airspace Change Proposal.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A conflict between IFR and VFR traffic in Class G airspace in the vicinity of Cambridge RW05 FAT, resolved by the C560XLS crew.

Degree of Risk: C.