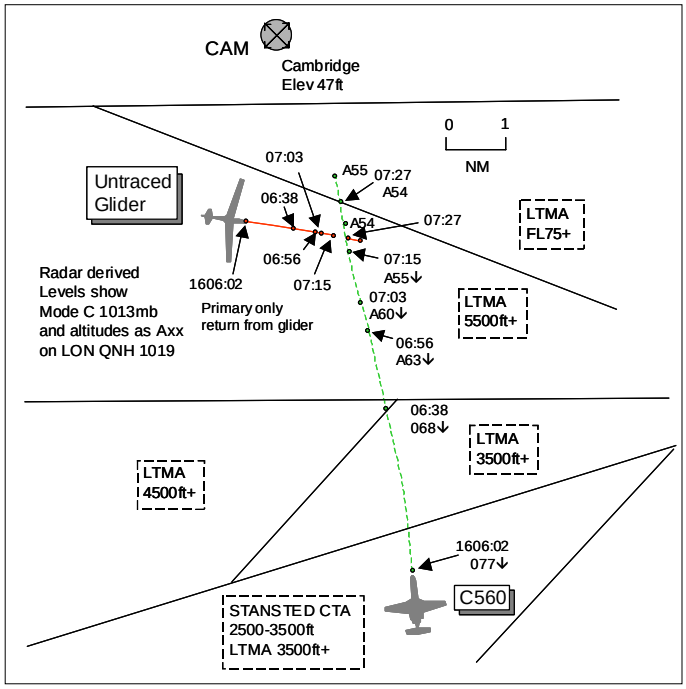
AIRPROX REPORT No 2010084

Date/Time: 3 Jul 2010 1607Z (Saturday)

Position: 5209N 00012E (4nm SSE Cambridge - elev 47ft)

Airspace: LFIR (*Class: G*)

	Reporting Ac	*Reported Ac*
Type:	C560XLS	Untraced glider
Operator:	Civ Comm	N/K
Alt/FL:	5500ft↓ (QNH)	(N/K)
Weather:	VMC CLBC	NK NR
Visibility:	>10km	NR
Reported Separation:	10ft V/20m H	NR
Recorded Separation:	0·1nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE C560XLS PILOT reports heading inbound to Cambridge IFR at 250kt and in communication with London squawking an assigned code with Modes S and C; TCAS was fitted. London instructed them to leave CAS in the descent to Cambridge although he was not sure if this was the cleared point or if a heading was given. They broke a layer of cloud at about 6000ft and, while receiving a call from London stating that they were leaving CAS and that Cambridge was closed, something reflected the sun on his LHS. He looked out of the L window and spotted a glider flying towards his ac very close, 15ft below and 25m away. Touch Control Steering (TCS) was initiated and he rolled to the R and pointed the ac's nose up to break the descent and move away from the glider, estimating separation was 10ft vertically and 20m horizontally at the CPA. After the avoiding action ATC repeated the transmission and he replied. After switching to Cambridge he reported the Airprox but no radar echo was spotted. The flight was continued with no further events.

RAC MIL reports that despite extensive tracing action the identity of the reported glider remains unknown. The glider could not be back-tracked to a departure airfield and it faded from radar 12nm SE of Cambridge. Procedural tracing action was then commenced and, although numerous gliding sites were contacted, no gliders were proffered as being a likely ac so unfortunately the reported ac remains untraced.

THE ESSEX RADAR CONTROLLER reports the C560 flight was descended to altitude 4000ft to leave CAS in the descent for Cambridge. As the ac was just leaving CAS Cambridge telephoned stating that they were closed due to the RW breaking up and that the C560 would have to hold at the CAM NDB. This was relayed to the C560 pilot who didn't reply straight away so the information was passed again and on receipt the flight was transferred to Cambridge.

ATSI reports that the Airprox occurred 3·8nm to the SSE of Cambridge Airport, at or just below altitude 5500ft, the base of London TMA-9, CAS. The LTC Essex Radar controller was operating in bandboxed mode, using the Stansted 10cm radar on a 30nm range. The controller considered traffic levels within the limits considered appropriate for bandboxed operations.

The Cambridge METAR was 031550Z 300/07kt 230V020 9999 SCT047 24/07 Q1018=.

Cambridge is situated in Class G airspace and lies just to the N of the boundary of CAS, London TMA-9 and TMA-18. The C560 was on a flight from Dublin to Cambridge and in receipt of a RCS; the ac was required to leave CAS for the last portion of the flight to Cambridge.

The glider was routeing W to E below the base of CAS. Tracing action after the incident did not identify the glider involved. The C560 pilot's written report stated that the event occurred at altitude 5500ft and 400ft below cloud.

With fine weather conditions on the day, radar recording shows that there was considerable activity outside CAS, with a high density of GA traffic in the area to the NW of Stansted and around Cambridge. Many of these were primary radar contacts, with the probability of a number being gliders.

The Essex Radar controller was experienced and had operated at the unit for a period of 15yr, holding a valid APR competency certificate for both Stansted and Gatwick. The controller had been in position for 30min prior to the incident and reported being fully rested prior to the start of shift. During the period prior to the event the workload was assessed by ATSI as being moderate.

The C560 was transferred to Essex Radar by LTC NE Deps and at 1604:25, the flight contacted Essex Radar, 6·9nm NW of Stansted Airport, in a L turn onto a heading 050° and maintaining FL90. The C560 flight was instructed to descend to altitude 6000ft on QNH 1018mb and was then given a direct routeing to Cambridge and at 1605:43 was given further descent, *"C560 c/s descend to altitude four thousand feet in the descent you will leave controlled airspace."* The pilot did not acknowledge this and Essex Radar repeated the instruction. At 1606:03, the pilot responded, *"descending altitude four thousand feet and we'll leave controlled airspace in the descent C560 c/s."* It was noted that the C560 was instructed to descend to an altitude of 4000ft and that may have given the impression of an executive, protected clearance, rather than the MATS 1 phraseology 'Cleared to leave controlled airspace by descent', with an acceptance level from Cambridge. The pilot was not asked what type of service was required outside CAS.

At 1606:02, radar recording shows the C560, passing FL77, 10·5nm N of Stansted in a L turn, with a slow moving primary contact tracking E, 6·5nm NW of the C560. The controller later commented that the glider was not seen.

At 1606:37, a phone call from Cambridge was accepted by the Essex Radar controller. Cambridge reported that the main RW had been closed and would result in the C560 having to divert. It was agreed that the C560 would be routed to the CAM hold whilst diversion arrangements were made. At this point the radar recording shows the C560 passing FL68, with a slow moving primary contact in the ac's 1130 position at range 3·4nm. During the phone conversation, an ac inbound to Stansted twice requested distance to run, without an acknowledgement. At 1606:56, the radar recording shows the C560 passing altitude 6300ft QNH with the unknown contact in its 1130 position at range 2·4nm. Essex Radar then replied, *"Sorry I was on the phone there station calling say again."* A flight responded and the distance to touchdown was provided.

The C560 pilot's written report indicated the cloud base was 6000ft. At 1607:03, the radar recording shows the C560 passing altitude 6000ft and the glider in its 1130 position at range 1·4nm. The Essex Radar controller informed the C560, *"And C560 c/s the unfortunately Cambridge has just had to close because of a runway deterioration erm so you won't be able to land there but if you wanna contact them now on one two three decimal six and they'll come back to me okay."* At 1607:16, the C560 pilot replied, *"Standby."*

[UKAB Note (1): The radar recording at 1607:15 shows the C560 at altitude 5500ft, which is the base of CAS, with the glider in its 10 o'clock range 0·4nm. On the next sweep 6sec later the glider has faded from radar whilst the C560 is seen to level at altitude 5400ft QNH. The glider reappears on the next sweep at 1607:27 in the C560's 6 o'clock range 0·7nm, the C560 still level at altitude 5400ft. The next sweep show the C560's Mode C indicating a climb to 5500ft before it then commences a descent towards Cambridge. The CPA occurs just after the glider fades and, taking into account the

glider's track and speed prior to and post fade, it is estimated the C560 passed about 0·1nm ahead of the glider.]

The controller later explained that the supervisor was informed regarding the situation at Cambridge and then assisted in answering further phone calls.

At 1607:36, the C560 responded, *"Er C560 c/s sorry er we almost hit a glider that's why I had to put you on standby could you please say again last information."* The controller passed the same message, *"Affirm Cambridge er the runway's had to close er due to runway deterioration er you won't be able to land there if you want to hold at the Charlie Alpha Mike and contact Cambridge one two three decimal six they'll keep you advised."* The pilot of the C560 replied, *"Okay er we'll enter the hold at Charlie Alpha Mike and er one two three decimal six er C560 c/s."*

The Essex Radar controller later stated that at no point was he aware of the primary contact and the controller did not hear the pilot reporting that the ac had almost hit a glider. It only became apparent to the controller, who was very surprised, when listening to a replay of events at a later stage. The controller was unable to explain why he had not seen the primary contact and accepted that it must have been visible on radar. It may have been that the contact was one of many, moving very slowly and not very noticeable, compared with the more prominent ac in CAS with SSR labels.

In discussing the sequence of events, the controller explained that he could not recall events exactly, but remembers the phone call from Cambridge being an unusual occurrence and distraction at a point when the C560 was about to leave the base of CAS. The controller described how, after the phone conversation, the supervisor had been informed about the situation at Cambridge, probably at the time when the pilot reported the glider and this may have been a cause for the controller miss-hearing a portion of the pilot's transmission.

When asked about the change of service, the controller explained that, because Cambridge is close to the boundary of CAS, ac are routinely transferred and the RCS terminated, at the boundary. The controller recognised that when the C560 left CAS, the radar service had not been terminated or changed. CAP493, Manual of Air Traffic Services, Part 1 (MATS Pt1), Section 1, Chapter 5, page 1, Paragraph 1.2.2, states:

> 'Pilots must be advised if a service commences, terminates or changes when:
> a) they are operating outside controlled airspace; or
> b) they cross the boundary of controlled airspace.'

The controller was asked if, prior to aircraft leaving CAS, it was normal to scan ahead for conflicting traffic operating in the adjacent uncontrolled airspace. The controller confirmed that this was normal practice and could not remember scanning ahead or seeing the slow moving primary contact. The controller added that the radar service would normally have been terminated as the C560 approached the base of CAS and the flight transferred to Cambridge. Had the controller noticed the unknown primary contact, TI would have been passed.

The controller accepted that workload was moderate, but considered traffic levels within the limits for bandboxed operations however, it is not always possible to predict workload increases due to unusual events.

NATS Swanwick have undertaken a number of actions as a result of this incident, including a review of current safety risks and MATS Pt2 procedures relating to aircraft leaving and joining CAS.

A Safety Notice SIN 002/10 SWN was issued by NATS Swanwick on 16/07/10 to raise awareness of the incident and emphasise the importance of changing service for ac leaving CAS by descent.

A Supplementary Instruction SI 139/10 LTC, was issued by NATS Swanwick on 14/12/10, making the following addition to TC MATS Pt 2, GEN section:

> ‘A pilots ultimate responsibility to avoid collisions within Class F and G airspace is detailed in MATS Part 1, Section 1, Chapter 11 Page 1. According to MATS Part 1, Section 1, Chapter 5, controllers must advise a pilot if a service terminates or changes when they cross the boundary of CAS. If due to workload or other factors the exact point at which the aircraft leaves CAS cannot be monitored, controllers must advise the pilot what type of service will be provided outside CAS before the aircraft has left CAS. If the anticipated service is passed to the pilot before the aircraft leaves CAS, the point at which the service will change should be stated with reference to a FL/Alt or distance.’

The Essex Radar controller instructed the C560 to descend to 4000ft, leaving CAS in the descent. The pilot was not advised of the point at which the radar service would be terminated and therefore may not have been fully aware of the transition into Class G airspace. MATS Pt1, Section 1, Chapter 11 page 1, Paragraph 2.2.1, states:

> ‘Within Class F and G airspace, regardless of the service being provided, pilots are ultimately responsible for collision avoidance and terrain clearance, and they should consider service provision to be constrained by the unpredictable nature of this environment……’

At the crucial point when the C560 was approaching the base of CAS, with the glider displayed on the radar, (albeit as a slow moving, less prominent radar return), the Essex controller’s attention was concentrated on the ILS traffic and phone call from Cambridge.

The Essex Radar controller considered traffic levels to be within the limits for bandboxed operations. It is recognised that it is not always possible to predict in advance unforeseen events or factors that can quickly generate additional workload. However, CAA ATSI assesses that the workload and distraction were factors which diverted the controller’s attention away from the C560 as it left CAS and resulted in:
a) the controller not detecting the radar return of the slow moving glider and consequently not passing a warning or avoiding action.
b) the controller not hearing the pilot’s transmission concerning the gliders proximity.

The C560 left CAS by descent and the Essex Radar controller did not properly terminate or change the level of service. In examining MATS Pt1, CAA ATSI considered that little guidance is provided to controllers with regard to duty of care and the changing responsibilities of pilots and controllers when ac transition from controlled to uncontrolled airspace or vice versa.

ATSI RECOMMENDATIONS.

It is recommended that:

The CAA review the guidance, phraseology and procedures for air traffic controllers and pilots with regard to aircraft leaving and joining controlled airspace, with particular reference to the changing responsibilities of pilots and controllers when aircraft transition from uncontrolled to controlled airspace and vice versa.

NATS Swanwick LTC review their procedures for bandboxed operations.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of the C560, transcripts of the relevant RT frequencies, radar video recordings, reports from the air traffic controllers involved and reports from the appropriate ATC authorities.

Although the Essex Radar controller had informed the C560 crew that they would be leaving CAS in descent, it was not stated when this would occur. Airspace boundary levels are depicted on en-route charts and would normally be shown on a moving map display if the ac was EFIS equipped.

However, it would not always be obvious to the crew from their Approach charts. Therefore best practice would be for the controller to inform a flight precisely when/where it will cross the boundary or pass through the level when the ac transitions into Class G airspace, and whether the ATS will be changed or terminated. This information would alert or remind the crew about their impending change of responsibilities. Nevertheless, the Board was satisfied that the pilot had assimilated the message that he was leaving CAS and that he understood the implications.

Owing to the short track distance to the airport Members thought that it was unlikely that Essex Radar intended to provide ATSOCAS, the controller just releasing Cambridge inbound traffic early by terminating the service and transferring communication and control to Cambridge Approach. This did not occur in this Airprox owing to the RW closure message and subsequent coordinated course of action being agreed on the telephone between both ATSUs. Consequently by the time the Essex controller had returned his attention to the C560 and passed the message, the Airprox was occurring. An early transfer of flights leaving CAS does allow the receiving ATSU to establish and agree the ATSOCAS with the ac's crew in good time.

The glider was flying just below the base level of CAS in VMC when the C560 broke cloud at 6000ft, 500ft above the base level. This would have only allowed the C560 crew about 10sec to visually acquire the glider, which they did as they transitioned through 5500ft into Class G. Mindful of this, a CAT Member stated that had Essex seen the glider's primary only contact and passed TI or a warning, it would have alerted the C560 crew to the confliction but would probably not have affected the outcome. Without a report from the glider pilot, it was not known whether he saw the C560 in the limited time available before the CPA. Members agreed that the C560 crew had no opportunity to see the glider any earlier and that this Airprox had been a conflict on the boundary of CAS and Class G airspace.

Turning to risk, with only one viewpoint of the incident quoting minimal separation distances, Members looked closely at the recorded radar data for the geometry of this close encounter. The C560 pilot seated on the LHS saw the glider on his L very close and instinctively rolled R and pointed the ac's nose up to avoid a collision, estimating separation as 15ft vertically and 25m horizontally. Although the glider's radar return faded as the ac passed, the CPA was within 0·1nm (185m): a close call. Members were acutely aware of the difficulty in accurately judging separation by eye, particularly when faced with a sudden surprise situation. On the balance of probability, taking the radar distances into account, it was thought that the distances, although close, might have been underestimated. From the information available, the Board believed that the actions taken by the C560 crew had been enough to remove the actual risk of collision but the ac had passed with margins significantly reduced such that safety had not been assured.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict on the boundary of CAS and Class G airspace.

Degree of Risk: B.