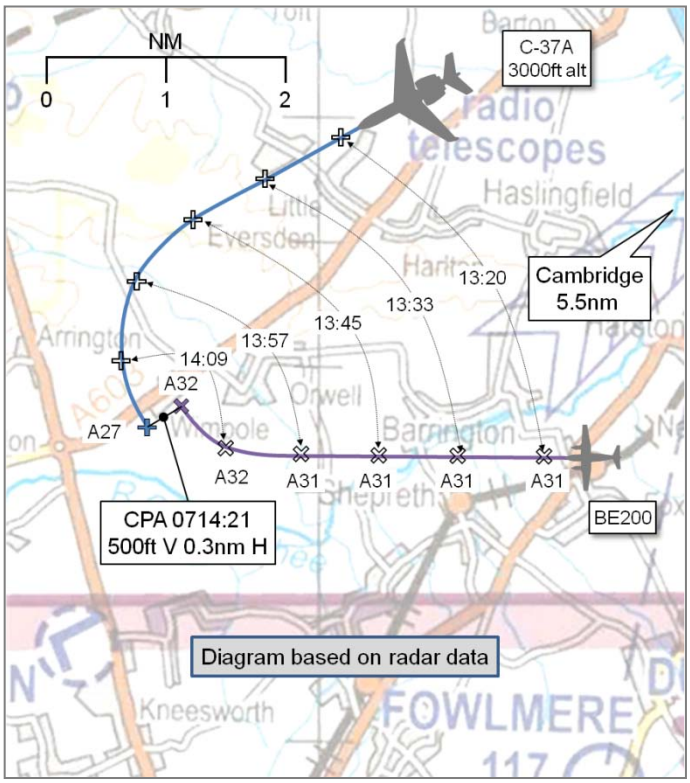
AIRPROX REPORT No 2013032

Date/Time: 2 May 2013 0714Z

Position: 5500N 00028W (9nm SW Cambridge - elevation 47ft)

Airspace: Lon FIR (*Class:* G)

	Reporting Ac	*Reported Ac*
Type:	C-37A	BE200
Operator:	Foreign Mil	Civ Comm
Alt/FL:	3000ft (NK)	3000ft (QNH)
Weather:	VMC	VMC CAVOK
Visibility:		>20km
Reported Separation:	0ft V/1nm H	500ft V/1nm H
Recorded Separation:	500ft V/0.3nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE C-37A PILOT (a military Gulfstream V) reports en-route from Turkey to Cambridge, IFR, heading 051° at 180kt and 3000ft, squawking Modes S and C. The flight deck crew complement was 2 pilots and an engineer. He reported receiving a BS, he thought, from Cambridge TWR on 125.9MHz. Whilst positioning for the RNAV(GNSS) RW05 at Cambridge, he received an RA from a white BE200 at co-altitude (he believed). Having entered the local IFR pattern at Cambridge, the TWR pointed out traffic holding SE of the airport. He saw the traffic and reported visual. As he turned to heading 051° to intercept final for the GPS approach, he received an RA from the same traffic. He descended 500ft and increased the rate of turn onto heading 070° to avoid the traffic. Once clear of traffic he re-established course and landed uneventually. He assessed the vertical separation as 0ft and horizontal as 1nm.

THE BE200 PILOT (single crew) reported en-route from Southend to Cranfield, VFR, heading W at 180kt and 3000ft. He was CAVOK, VMC, and the ac was coloured white, with white strobes, a beacon and navigation lights. The ac was squawking 7000 Modes S and C; TCAS was not fitted. He was supplied with a BS from Cambridge APP on 123.60MHz; Cambridge radar was not available. He was aware of a Gulfstream inbound to Duxford from the N, he deduced. After changing frequency to Cranfield APP, he thought, he obtained visual contact with the ac in his 2 o'clock at about 5nm, similar level, crossing R to L and possibly descending. He considered no manoeuvring action was needed at the time. At the 1230 position, at approximately 2nm, the Gulfstream started a descending L turn. To maintain visual contact he turned R and watched the ac disappear below and behind his LHS at least 500ft below, with a minimum range of 1nm.

THE CAMBRIDGE APP CONTROLLER reported that the C-37A, on an IFR flight, was co-ordinated inbound to CAM, descending to 5000ft with London Mil. At approximately 0709 the BE200 pilot called SE of the airport westbound at 3000ft, requesting a BS. The C-37A pilot requested a RNAV approach to RW05, inbound from the NE, under a PS. TI was passed to both ac. The C-37A pilot was instructed to descend to 3000ft and cleared own navigation to BEPOX for RNAV 05. The BE200 pilot requested to leave the frequency for Duxford Radio on 122.075MHz and confirmed he would maintain 3000ft. The C-37A was seen from the VCR passing approximately 0.5nm N of the airport, tracking SW towards BEPOX. Further TI about the BE200 was passed to the C-37A pilot, who reported visual. At approximately 0715, noticing the BE200 apparently close to the C-37A, the TI was

updated and visual contact was confirmed. The pilot then reported descending due traffic. The BE200 was observed to be making sharp turns to avoid the C-37A. Once on the ground, the C-37A pilot reported his intention to file an Airprox report.

Factual Background

The meteorological situation at Cambridge Airport was reported as follows:

METAR EGSC 020720Z VRB02KT CAVOK 08/01 Q1024=
METAR COR EGSC 020650Z VRB03KT CAVOK 07/01 Q1024=

The Cambridge APP was providing combined Aerodrome and Approach PS without the aid of surveillance equipment. Cambridge ATC had commenced operational watch at 06:00 UTC and the APP had been in position for 1hr and 14min prior to the Airprox. Traffic was described as 'very light'.

There is no requirement to separate IFR and VFR traffic in Class C airspace.

Cambridge Approach ATS provision is notified in the UK AIP at AD 2.EGSC, section 2.18 (2 May 2013), specifically, radar is available only intermittently Mon-Fri during normal working hours and by arrangement only:

Service Designation	Callsign	Channel(s)	Hours of Operation
1	2	3	4
APP	CAMBRIDGE AP-PROACH	123.600 MHz	Winter: Mon-Fri 0700-2100 Sat, Sun 0800-1900 and by arrangement Summer: Mon-Fri 0600-2000 Sat, Sun 0700-1800 and by arrangement
RAD	CAMBRIDGE RADAR	123.600 MHz	Available intermittently Mon-Fri during normal working hours and by arrangement only;

The UK AIP ENR 1.1-10 (13 Dec 2012), paragraph 2.3.3 states:

'Under a Basic Service a pilot should not expect any form of traffic information from a controller; however, on initial contact the controller may provide traffic information in general terms to assist with the pilot's situational awareness. This will not normally be updated unless the situation has changed markedly, or the pilot requests an update'

The UK AIP ENR 1.1-11 (13 Dec 2012), paragraph 2.6.1 states:

'A Procedural Service is a non-surveillance ATS where, in addition to the provisions of a Basic Service, the controller provides instructions, which if complied with, shall achieve deconfliction minima against other ac participating in the Procedural Service. Neither traffic information nor deconfliction advice can be passed with respect to unknown traffic. A controller will provide traffic information on conflicting ac being provided with a Basic Service; however, there is no requirement for deconfliction advice to be passed, and pilots [under either service] are wholly responsible for collision avoidance'

ATSI Analysis

The C37A pilot called Cambridge at 0706:00 UTC and requested the RNAV procedure for RW05. This was approved and the C37A was cleared to BEPOX at 3000ft on QNH 1024hPa. Cambridge

informed the C37A pilot that it was a PS and specifically stated that the service was non-radar. The Cambridge conspicuity code 6177 was assigned. The RNAV 05 procedure is extracted at Figure 1 below.

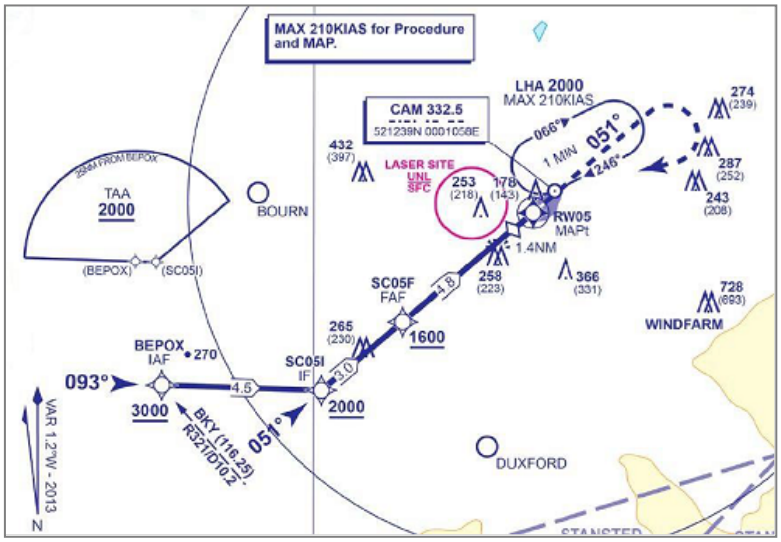


Figure 1: UK AIP AD 2-EGSC-8.2 (dated 4 Apr 2013): Cambridge RNAV (GNSS) RW05

At 0707:00 the BE200 pilot called Cambridge and requested a BS, which was agreed. He asked Cambridge, "*…can you see any traffic at Duxford?"* To which the Cambridge APP replied, "*I'm not looking at radar I'm afraid but traffic information* [0707:20] *northeast of Cambridge er descending er t-westbound before inbound to the airfield is a er Gulfstream five descending initially to three thousand feet."* This was acknowledged by the BE200 pilot and QNH 1024hPa was confirmed.

At 0708:40 the C37A pilot gave his estimate for BEPOX as 0714 and was instructed to report at BEPOX.

At 0709:20 the Cambridge APP passed TI to the C37A pilot on a C172 at 2000ft holding over the A/D and on the BE200, "*on your er left-hand side westbound last reported three thousand feet."* The C37A pilot reported, "*searching".* See Figure 2 below.

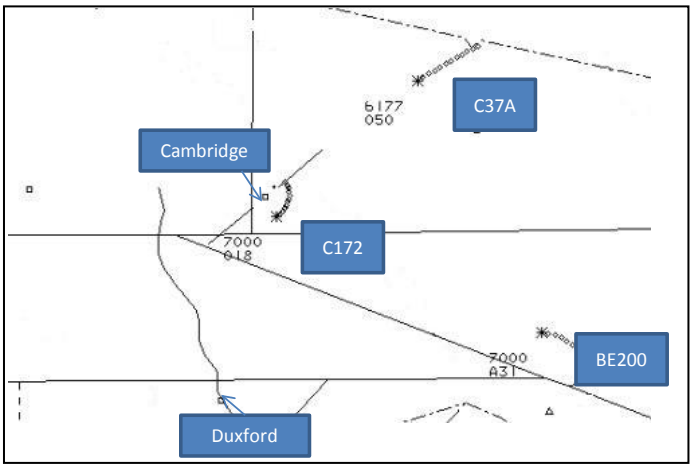


Figure 2: Stansted 10cm radar – 0709:20 UTC. Note: for reference the extended centreline markers for Cambridge RW05/23 represent 2nm.

At 0710:00 the BE200 was 8.5nm SE of Cambridge and 9nm ENE of Duxford. The pilot reported, "*changing to Duxford 122.075."* The Cambridge APP replied, "*Roger and confirm you'll be maintaining three thousand feet* [0710:10] *at all times*." The BE200 replied, "*affirm"*, and left the frequency.

Duxford Aerodrome, its ATZ and provision of ATS services are notified as commencing/opening from 0900 UTC during summer. Recording of Duxford Information's frequency (122.075MHZ) is H24 voice activated; however, on the morning of 2 May this equipment was out-of-service. Therefore, any calls on the frequency by the BE200 cannot be verified.

At 0713:00 the Cambridge APP informed the C37A pilot, "*the previously mentioned Beech Two Hundred traffic no longer on frequency however I'm visual from the control tower* [0713:10] *on your left hand side three thousand feet."* The C37A pilot replied "*has him in sight"*. See Figure 3 below.

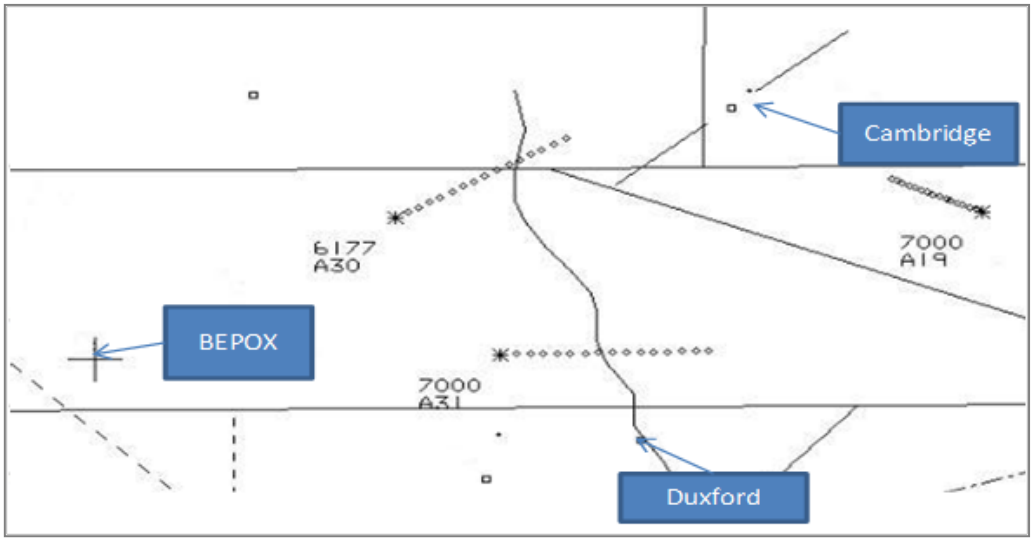


Figure 3: Stansted 10cm radar– 0713:10 UTC. Note: the BE200passed 1.7nm N of Duxford A/D.

The C37A pilot reported at BEPOX at 0713:40; however, he was 4.1nm NE of BEPOX heading 245°. The pilot reported in a LH turn and requested clearance confirmation for the RNAV procedure. Confirmation was given and the pilot was requested to report established on the FAT.

At 0714:02 the C37A was in a L turn maintaining altitude 3000ft (approximately 3.5nm short of BEPOX). The BE200 was westbound at 3100ft, having just passed the SC05I waypoint. See Figure 4 below (waypoint SC05I, which follows BEPOX in the RNAV procedure, is shown).

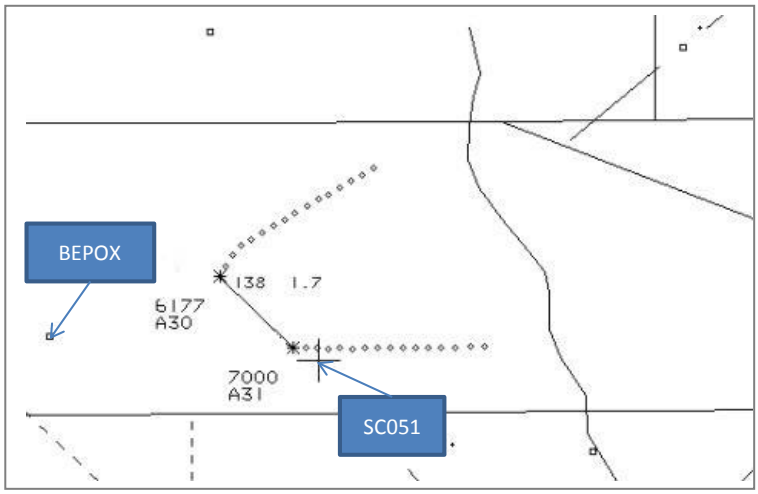


Figure 4: Stansted 10cm radar – 0714:02 UTC.

At 0714:10 the C37A pilot reported, "*descending due to er traffic".* The APP responded by asking whether the C37A pilot was still visual with the BE200, to which he replied, "*affirm*". The BE200 pilot's report indicated that he was visual with the C37A.

The C37A's L turn then appeared to stop as it descended to 2700ft. The BE200 turned R and climbed to 3200ft as the ac passed 0.4nm abeam. Figure 5 shows the closest distance between the two ac as recorded by the Stansted 10cm radar (ac-to-ac distance was 2481ft). The ac were 9nm SW of Cambridge.

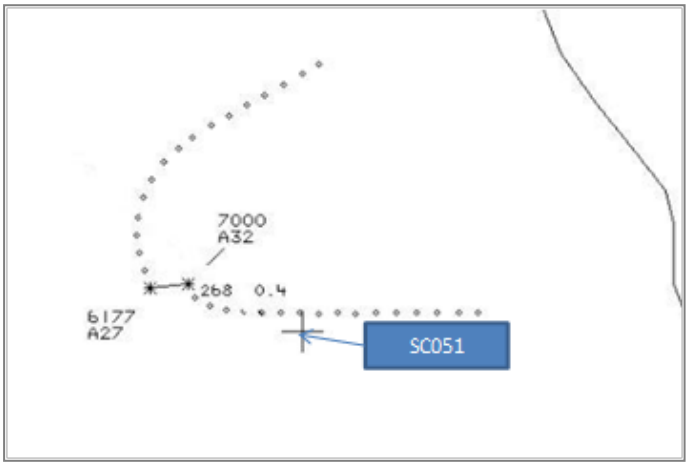


Figure 5: Stansted 10cm radar – 0714:20 UTC. Closest radar recorded distance.

Two TCAS RAs were recorded via Mode S downlink from the C37A to area surveillance facilities. At 0714:04 the C37A's TCAS issued a Descend Advisory and at 0714:14 an Adjust Vertical Speed advisory was issued. Simulation of the encounter using InCAS software corresponded well with the downlinked information received. The simulation suggested the CPA occurred at 0714:21, when horizontal distance was 0.3nm (556m) and vertical distance was 528ft (ac–to-ac distance 1898ft).

The C37A continued on to final approach and landed at 0718:45.

At approximately 0720:00 the BE200 pilot called Cranfield TWR (134.925MHz) and received no reply. Several more unanswered calls were made until, at 0729:00, a reply was received instructing him to recall Cranfield APP on 122.850MHz. Cranfield's ATS Operational Hours are notified as from 0730 UTC Mon – Fri during summer months. UK AIP AD 2.EGTC-1 (10 Jan 2013).

USAFE Comments awaited

Summary

The Airprox took place 9nm SW of Cambridge in Class G airspace when a C37A and a BE200 came into confliction at 3000ft. Both pilots were visual with each other having been given TI by Cambridge ATC. The C37A received a TCAS RA relative to the BE200.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac, transcript of the relevant RT frequency, radar photographs/video recordings, a report from the air traffic controller concerned, and a report from the appropriate ATC and operating authorities.

The Board first considered the actions of the inbound C37A, which was being provided with a PS by Cambridge ATC. Although ATC had informed the pilot that a radar service was not being provided, members wondered whether the pilot really understood the meaning of a PS. They considered that the pilot, under IFR, may have mistakenly believed that he was being provided with separation from non-participating traffic by ATC. This impression was reinforced by the nature of the Airprox itself, and its reporting - the C37A pilot had turned his ac towards another ac that he had visual sighting of, passed close by, and then filed an Airprox.

The Board then discussed whether the C37A pilot had carried out the RNAV procedure correctly. While positioning for the RNAV procedure for RW05, the controller requested the C37A pilot to report at BEPOX. However radar recordings reveal that the ac turned about 3.5nm short of BEPOX. One of the pilot members explained that, unless the procedure states that an ac has to fly over a particular point, an early turn can be made in order to enable an ac to establish on the inbound leg. This was appropriate in the circumstances of this incident, where the C37A was approaching BEPOX from the NE, necessitating a 180° turn onto the final leg – an early L turn before BEPOX would allow the ac to be established on the inbound leg by SC051. Nevertheless, it was felt that confusion could have been caused in the minds of other pilots and controllers given the procedural nature of the approach and the fact that the C37A had reported being 'at BEPOX' after he had been requested to route there rather than report that he was 'turning before BEPOX'.

As for the BE200, the Board noted that the pilot was transiting through Class G airspace, being provided with a BS, as he requested, by Cambridge ATC. Members reasoned that he was probably not expecting much other traffic to be in the vicinity, as it was fairly early in the morning (0814 local at the time of the Airprox). On asking the Cambridge controller if he could see any traffic at Duxford, Board members considered that the controller's response when issuing TI about the C37A was ambiguous and may have led the BE200 pilot to believe that the C37A was inbound to Duxford rather than Cambridge. This may have been a factor in the BE200 pilot requesting a frequency change to Duxford before visual contact was established with the C37A. GA members wondered why he did not contact Duxford on another radio, thereby also remaining on the Cambridge frequency until he had visual contact with the other ac. They also wondered whether the Cambridge controller might not have been able to advise him that Duxford was closed until 0830 and therefore unlikely to respond. Notwithstanding, despite not being on the same frequency, the BE200 pilot did become visual with the C37A at a range of 5nm, and was able to turn away from it as it turned towards his ac.

Turning to examine the ATC aspects of the incident, it was apparent to the Board that the controller had properly informed the C37A pilot that a radar service was not being provided, and a PS service was, therefore, considered appropriate. TI was passed to the pilot about the presence of the BE200 and was later updated from a visual observation from the controller, allowing visual contact. TI was also issued to the BE200 and, although the message may have been ambiguous, it was effective in leading the pilot to sight the C37A.

The Board then considered the cause. Both ac were operating in Class G airspace and were responsible for their own separation. This relied on both pilots being visual with the other ac, which was achieved. However, when the C37A pilot sighted the BE200, he was still tracking SW. He then commenced a L turn on the RNAV procedure, resulting in him turning directly into close proximity with the BE200. The Board agreed that, overall, safety margins had not been much reduced below normal because both pilots were visual with each other; the BE200 turned away from the C37A and the latter ac reacted to a TCAS RA.

Considering the relevant safety barriers, the Board agreed that 'ATCO Rules and Procedures', 'Controller Action', 'Visual Sighting', 'SA from RT', 'SA from ACAS' and 'Compliance with ACAS RA' had all been relevant and effective. Of the other barriers, they considered that, although 'Aircrew Rules and Procedures' and 'Aircrew Action' had been reduced in effectiveness, overall, the safety barriers had been effective, which gave an Event Risk Classification score of 10.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The C37A pilot turned into conflict with the BE200.

Degree of risk: C.

ERC Score: 10.