

## AIRPROX REPORT No 2012052

Date/Time: 17 Apr 2012 1447Z

Position: 5211N 00007E (2.5nm SW of Cambridge)

Airspace: LTMA/FIR (Class: A/G)

Reporter: LTC Swanwick

1st Ac 2nd Ac

Type: A319 C550

Operator: CAT Civ Comm

Alt/FL: ↓6000ft <10000ft↓  
QNH (996hPa) (996hPa)

Weather: NK NK VMC Rain

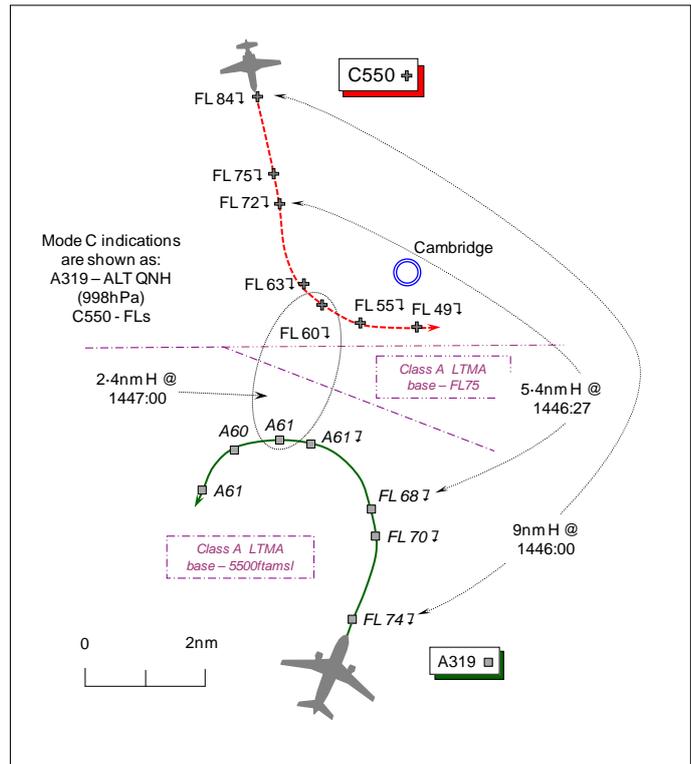
Visibility: NK >10km

Reported Separation:

NK NK

Recorded Separation:

550ft V/2.4nm H



**CONTROLLER REPORTED**

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

**THE LTC STANSTED INTERMEDIATE CONTROLLER (ESSEX RADAR)** reports that the A319 was inbound to Luton and, when O/H BKY, placed on a NE'ly heading with descent to 6000ft QNH (996hPa). After some weather avoidance for another flight, the A319 was turned toward Luton. At this point the Luton controller pointed out the C550 inbound to Northolt on a Charlie arrival working LJAO E. The C550, in Class G airspace, was descending at a high rate in order to get beneath the base of CAS. STCA activated and he issued avoiding action to the A319 crew, turning the ac further L. LJAO E also turned the C550 to the L. Since the A319 was inside CAS and the C550 outside CAS in Class G airspace there was no loss of separation, but in his opinion safety was compromised.

**THE A319-100 PILOT** completed an Airprox report 3 months after the occurrence. He states that he was in receipt of a RCS descending through 6000ft; no TCAS TAs or RAs were enunciated.

**THE CESSNA CITATION C550B (C550) PILOT** reports he had just completed a functional check flight (FCF) on an IFR FPL and was flying back to Northolt in VMC, following radar vectors from LATCC (Mil) LJAO E under a DS. The assigned squawk was selected with Modes C and S; TCAS is fitted.

Close to BKY, during the descent at 220kt they received many radar vectors; ATC issued a R turn onto a S'ly heading between 180° to 240° and some seconds later passed an 'immediate L turn' onto a heading between 090° to 150°, but neither he nor his co-pilot could remember the exact heading. The first S'ly turn was not completed before they started the avoidance manoeuvre. The ac they were avoiding was displayed on TCAS but the contact never went yellow; neither a TA nor an RA was enunciated. The other ac - a white twin-engine airliner - was seen and they supposed the minimum separation was at least 6-8nm, but it was too far away to estimate or identify the type of ac and they did not check with ATC. He assessed the Risk as between 'none' and 'low'.

**THE LATCC (MIL) LJAO EAST TACTICAL CONTROLLER (LJAO E)** reports that at the time of the Airprox he was working only the C550, which had been operating in the East Anglia area on an air test at FL150 under a DS. He had been on console for about 5min when the C550 crew informed

him that their air test was complete and requested recovery to Northolt; a R turn onto S was issued to position the ac towards BKY for a 'CHARLIE' Arrival. Two Tornado ac then climbed out of Marham and were coordinated not above FL140, which kept the C550 at FL150. As the C550 was tracking towards BKY he noticed an unknown A7000 squawk, but with no Mode C, tracking slowly NE at a range of 20nm, which he perceived to be a risk. Therefore, TI was passed to the C550 crew with, in addition, a 15° L turn if the other ac was not sighted; the C550 crew executed the turn which resolved the confliction with the unknown ac squawking A7000. Luton RADAR was prenoted and required the ac to remain below CAS and route towards BKY, descending to 2400ft Luton QNH (996hPa). Following this, he instructed the C550 crew to set the Luton QNH and descend initially to an altitude of 4000ft as the Area Safety Altitude (ASA) in that area was 3300ft, (4000ft to the S of Cambridge where the LTMA base is 5500ft). As the C550 approached 8000ft in descent he informed the crew that below the ASA they would be responsible for their own terrain clearance and asked if the crew could accept TS for further descent. He confirmed acceptance of TS and a descent to 2400ft ALT was issued. At this point his attention was drawn to the A319, inside Class A CAS where the base level is 5500ft (London QNH), descending to 6000ft with a London Luton SSR data block indicator. At this point he believed that the C550's ROD would place it below the TMA and so he did not perceive a confliction with the A319. As the two ac converged he realised that the C550 would not remain outside CAS and issued an avoiding action L turn onto 090° to remain clear of both CAS and the A319. At this point the C550's Mode C indicated above 6500ft ALT, (and above the ASA of 3300ft for that Sector). With the C550 remaining outside CAS and the A319 turning L onto a track of 210° (to remain within CAS), STCA activated, followed by the CAS warning. Once the C550 was below 5500ft he released the crew onto their own navigation towards BKY and then called Luton RADAR. After talking to Luton RADAR he issued the assigned Luton squawk, and passed the ac on to Luton RADAR.

**ATSI** reports that the Airprox occurred 2.5nm SW of Cambridge Airport, on the northern boundary of Class A CAS (LTMA-9), between an A319 inside CAS and a C550 outside CAS within Class G airspace. The A319 crew was operating IFR, inbound to London/Luton and in receipt of a RCS from the LTC Essex RADAR controller. The C550 was returning IFR to Northolt after the completion of a functional flight check and was in receipt of DS from LATCC (Mil) LJAO E. This changed to a TS just prior to the Airprox.

The Essex RADAR controller's workload was assessed as medium and CB activity in the area resulted in requests for weather avoidance, which added to the complexity of the situation.

The LONDON QNH datum was 998hPa.

The 1420Z Luton METAR: 25015KT 9999 SCT043 12/02 Q0996=

The 1420Z Cambridge METAR: 24017KT 9999 FEW025 SCT040CB 14/01 Q0995=

The C550 crew, under the control of LJAO E, was in receipt of a DS inbound for a Northolt non-airways 'CHARLIE' arrival for RW25. This required the C550 to descend below CAS to an altitude of 2400ft London QNH, routeing via BKY. At 1438:49, LJAO E passed inbound details on the C550 to Luton RADAR in accordance with standard procedures. Luton RADAR issued a squawk of A4676 and agreed to accept the C550 in the descent to an altitude of 2400ft QNH N of BKY.

At 1443:56, the A319 crew contacted LTC Essex RADAR and reported descending to FL90. Essex RADAR gave the A319 crew a heading of 025° and cleared them to descend to an altitude of 6000ft Luton QNH (996hPa). The radar recording shows the A319 passing 15.5nm NE of Luton Airport towards BKY, indicating FL104, with the C550 positioned 27.7nm N of the A319, indicating FL121.

At 1444:30, the Essex RADAR controller became involved in an RT exchange with another ac requesting weather avoidance routeing outside CAS, which increased the RT loading. At 1445:51, Essex RADAR instructed the A319 to turn L heading 250°. The distance between the two ac was 10.4nm. In his written report the Essex RADAR controller indicated that Luton RADAR advised him about the C550 inbound to Northolt via BKY.

At 1446:21, STCA activated at low level – white - and recorded radar data shows the distance between the two ac as 6.5nm. The controller immediately issued avoiding action, “[A319 C/S] *avoiding action continue that turn left heading 2-1-0 degrees there’s unknown traffic 4 miles north of you 7 thousand 1 hundred feet descending.*” At 1446:32, STCA activated at high level - red (see Fig 1). The A319 pilot responded, “*Copied left heading 2-1-0 degrees [A319 C/S]*”. The A319 is shown indicating an altitude of 6300ft with the C550 indicating FL71. [About 6650ft London QNH (998hPa).]



Fig 1 - 1446:32

[UKAB Note (2): At 1446:51, the C550 is shown commencing a L turn onto a SE’ly track. The CPA occurs at 1447:00, when the Stansted 10cm Radar recording shows the distance between the two ac as 2.4nm with vertical separation of 550ft. The A319 was indicating an altitude of 6100ft QNH (998hPa) and the C550 was indicating FL60 – equivalent to about 5550ft London QNH (998hPa).]

At 1447:52, the controller updated the A319 pilot, “[A319 C/S] *descend to altitude 5 thousand feet – to keep you in the picture that traffic was working the military it actually remained outside controlled airspace so there was no loss of separation.*” The pilot replied, “*Okay that’s copied descend 5 thousand feet [A319 C/S]*”. At 1448:42, the controller transferred the A319 to Luton RADAR.

The Essex RADAR controller’s workload was medium with added complexity due to weather avoidance. The A319 was approaching BKY when the controller was involved in an RT exchange regarding weather avoidance which would involve another ac leaving CAS. Immediately after this, the controller turned the A319 L onto a heading of 250° and at the same time became aware of the C550 which was descending to 2400ft, through FL87, with a high ROD. The speed, closure rate and tracks of the two ac caused the controller to be concerned. This together with low and high STCA activation caused the controller to give avoiding action to the A319 crew. At the same time the LJAO controller gave the C550 an avoiding action turn onto an E’ly track to remain clear of CAS. The C550 remained outside CAS and was deemed to be separated.

The Manual of Air Traffic Services (MATS) Part 1, Section 1, Chapter 5, Page 12, paragraph 13.1.4, states:

‘Although aircraft operating in controlled airspace are deemed to be separated from unknown aircraft flying in adjoining uncontrolled airspace, controllers should aim to keep the aircraft under their control at least two miles within the boundary. Controllers should be aware of the operation of aircraft in adjacent uncontrolled airspace, particularly if circumstances have made it necessary to vector an aircraft to be less than two miles from the boundary. In such circumstances, consideration should be given to co-ordinating with the appropriate controlling agency if applicable. Unpredictable manoeuvres by unknown aircraft can easily erode

separation and controllers should take appropriate action with respect to the safety of the aircraft.'

The Airprox occurred when the controller became concerned about the close proximity and trajectory of the C550, which because of the speed and closure rates caused the high level STCA to activate and caused both controllers to give avoiding action. A number of factors were considered to be contributory:

The LJAO controller allowed the C550 to route direct to BKY which, given the level and trajectory of the C550, was unlikely to keep the ac outside CAS and required an avoiding action turn.

The added complexity of the CB activity and Wx avoidance may have limited the controller's ability to recognise the situation earlier and resulted in an avoiding action turn when the controller became concerned about the intentions of the C550.

**BM SAFETY MANAGEMENT** reports that during the incident sequence the LJAO E controller made a number of skill and knowledge based errors; for brevity, this report will address only those issues that directly involved the Airprox.

The C550 crew had been operating in East Anglia on an air test whilst in receipt of a DS from LJAO E and was the only ac on frequency. Whilst LJAO E described their workload and task complexity as 'low', BM SM contends that the descent of an ac into the lower airspace to affect a handover to Luton is often complicated given the presence of background traffic; this complexity is heightened when the ac in question is in receipt of a DS.

The incident sequence commenced at 1441:34, when LJAO E instructed the C550 crew to descend to FL70, routing inbound to Northolt. At this point, the C550 was 22nm N of that element of the LTMA with a base of CAS (BoCAS) of 5500ft QNH to the SW of Cambridge and FL75 to the SE of Cambridge. At 1442:53, LJAO E instructed the ac to descend to 4000ft Luton QNH (996hPa). At this point, the C550 was 16.8nm N of the BoCAS, descending through FL135, and the A319 was 35.5nm S of the C550, tracking NNE'ly, descending through FL120. At 1444:42, LJAO E passed TI to the C550 crew on un-related traffic stating, "*traffic right 1 o'clock, 1-5 miles, opposite direction, no height information, if not sighted, turn left 1-5 degrees, report steady with heading.*" The deconfliction vector was accepted by the C550 crew and, at 1445:32, they steadied on a heading of 175°. At this point, the C550 was 6.6nm N of the BoCAS descending through FL94; the A319 was 13.3nm SSE, tracking NE'ly, descending through FL82.

At 1445:50, due to LJAO E's ASA, the C550 pilot accepted a TS and LJAO E then descended the ac to 2400ft QNH in accordance with the acceptance altitude stipulated by Luton APP. Based upon LJAO E's report, it was at this point that the controller detected the A319, 10.7nm SSE of the C550, tracking NE'ly, descending through FL76; the C550 was descending through FL88 and was 5.2nm N of the BoCAS. LJAO E state that they believed that the C550's ROD would place the ac beneath CAS and thus clear of confliction. Assessment of the radar replay demonstrates that between 1444:00 and the CPA at 1447:00, the C550's ROD does not reduce below that established at 1445:50; it actually shows an increase. The Unit investigation confirmed that LJAO E did not use the level prediction tool available to them to assess the RoD.

At 1446:14, LJAO E instructed the C550 crew to, "*route now direct BARKWAY*", which was acknowledged. At 1446:21, STCA activated white between the C550 and the A319; the C550 was descending through FL76, 6.5nm NW of the A319 which was commencing a L turn inbound to Luton, descending through FL70. At 1446:26, LJAO E instructed the C550 crew, "*avoiding action, turn left immediately heading 0-9-0 degrees, traffic [the A319] was south, 7 miles, tracking north, at Flight Level 6-0.*" The description of the A319's level [FL68] as FL60 was erroneous and it is reasonable to argue that LJAO E had mistaken the C550's Mode S SFL for their SSR Mode C. At this point, the C550 was 2.6nm N of the BoCAS.

At 1446:53, the C550's turn in response to LJAO E's avoiding action becomes visible on the radar replay, with the C550 1nm N of the BoCAS and 2.8nm N of A319; the C550 was descending through FL63, the A319 was descending through FL61. The CPA occurred at 1447:00 as the C550 passed 2.4nm NNE of the A319, some 550ft below it. The C550 remained outside CAS throughout the incident.

LJAO E had not assimilated that the ROD of the C550 would place the ac closer to the BoCAS and thus into conflict with the A319. Once LJAO E identified the conflict between the C550 and the A319, either through their own perception of the event geometry or prompted through the action of STCA, LJAO E took positive action to resolve the conflict.

## **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.

Although separation was not eroded between the A319 within the Class A LTMA and the C550 in Class G airspace, the Board agreed the Essex RADAR controller had been entirely justified in submitting this report.

It was evident that the C550 crew was descending to their assigned altitude in Class G airspace in conformity with the instruction issued by LJAO E, who perceived initially the ac would pass clear beneath the base of the LTMA. Analysis of the radar recording suggests that if the C550 had maintained a projected southerly track then it would have been marginally below the BoCAS - at the radar return after the CPA the C550 indicated FL55 - equivalent to about 5050ft London QNH (998hPa) – suggesting the C550 would have remained just beneath Class A CAS where the BoCAS lowers to 5500ft ALT. Horizontal separation against the A319 would, however, have been minimal and in the Board's view, too close for comfort. The LJAO E controller, alerted by STCA, spotted the A319 and also concluded that the C550's track and ROD would be insufficient to keep the C550 in Class G airspace before the ac reached the boundary of the LTMA. Therefore, LJAO E elected to turn the C550 to remain clear of the A319 and also afford more room to manoeuvre clear of CAS. Given the activation of high-level STCA, coupled with the TI from the Luton controller that the C550 was descending inbound to Northolt, the Essex RADAR controller was rightly concerned at the C550's speed and closure rate and promptly issued avoiding action to the A319 crew, turning the ac away to the S. The combined effect of both these complimentary avoiding action turn instructions and the crews' responses ensured that horizontal separation did not diminish below 2.4nm.

It was concluded, unanimously, that the Cause of this Airprox was that the flight profile of the C550 caused the Essex RADAR controller concern. However, the avoiding action turn instructions proved wholly effective in ensuring that any Risk of collision was removed.

The Board noted BM SM's comments about achieving appropriate descent profiles with traffic descending into Class G airspace beneath the LTMA clear of CAS and other traffic, whilst also achieving a handover to Luton; this Airprox highlighted the inherent difficulties and complexity for LJAO controllers when controlling traffic inbound to Northolt in this busy and closely confined airspace. This Airprox was the first of two cases involving traffic in transit to Northolt for a 'C' arrival dealt with by the Board at this meeting. The assessment of the second case - Airprox 2012060 – resulted in a Safety Recommendation relating to the provisions of an ATS to traffic inbound for a Northolt 'C' arrival.

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

Cause: The C550's flight profile caused the Essex RADAR controller concern.

Degree of Risk: C.