

## AIRPROX REPORT No 2012078

Date/Time: 13 Jun 2012 1559Z

Position: 5251N 00137W (10nm WNW  
East Midlands - elev 306ft)

Airspace: EMA CTA (Class: D)

Reporting Ac Reported Ac

Type: DHC8 PA28

Operator: CAT Civ Trg

Alt/FL: ↓2000ft ↓1700ft  
QNH (1015hPa) QNH

Weather: VMC CLBC VMC HZBC

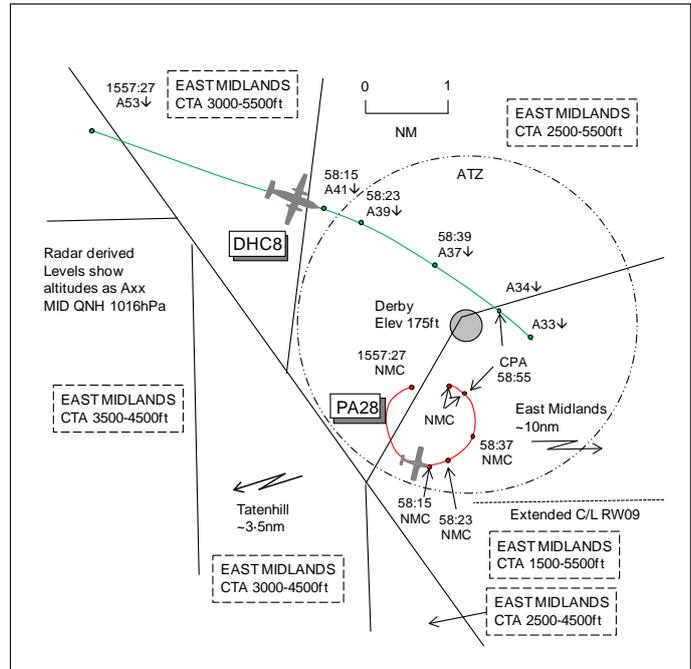
Visibility: 10km 3000m

Reported Separation:

NR Not seen

Recorded Separation:

NR V/1.1nm H



## PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

**THE DHC8 PILOT** reports inbound to East Midlands, IFR and in receipt of a RCS from East Midlands on 134.175MHz, squawking 7414 with Modes S and C. While on vectors descending to 2000ft QNH at 180kt ATC informed them of a light ac in close proximity and a TCAS TA was then generated; no height information was displayed with the TA. Flying 100ft below cloud but between layers with 10km visibility the FO then became visual with a Cessna ac, he thought, about 2nm away to their R. After further vectoring to the ILS an uneventful approach and landing was carried out. Whilst on the stand they were asked to contact ATC and the Supervisor informed them that minimum separation was lost owing the other ac infringing CAS.

**THE PA28 PILOT** reports on a local training flight (P1S) [See UKAB Note 1 below] with an instructor from Wellesbourne Mountford via Gamston, she thought, VFR and in receipt of a radar service from Birmingham on 118.05MHz, squawking with Mode C, she thought. The visibility was 3000m in haze flying 1000ft below cloud and the ac's strobe and beacon lights were switched on. She was tracking the NDB/ADF to Tatenhill [16nm W East Midlands] whilst in contact with East Midlands on 134.175Mhz, she thought. She then tracked towards LIC NDB, she thought, [NDB removed May 2010 from a position 4.5nm SSE Tatenhill] but turned further L not realising that the ac entered the East Midlands CTA about 8nm W of East Midlands airport. As soon as she realised this she headed W and contacted Birmingham Radar on 118.05MHz. Near Tatenhill she was flying at 2500ft and descended to 1700ft but forgot to inform ATC of the descent. She did not see the reporting ac.

UKAB Note (1): Although the PA28 pilot was accompanied by a qualified instructor and believed she was being instructed, it was not an instructional flight. The PA28 pilot signed for the aircraft in the Tech Log and the instructor did not enter the flight or claim the hours in his logbook.

UKAB Note (2): The PA28 operator advised that the PA28 transponder was placarded as Mode C inoperative since the ac's annual inspection was completed 10/02/2012.

**THE PA28 OPERATOR'S MANAGING DIRECTOR** comments that the CFI reviewed the details of the incident. The LIC NDB was decommissioned on the 6<sup>th</sup> May 2010 and hasn't appeared on either the 2011 and 2012 charts. The pilot reported operating as P1S and was therefore under supervision,

he thought. The pilot holds an IMC rating so may have been getting additional instruction; however, the standard of airmanship was very poor. It appears that this was a very badly planned flight probably as a result of an outdated chart. Later a meeting was held with the pilot and instructor and appropriate action has been taken. The company are very focussed in providing the highest level of training to students and ongoing support to club members, who hold PPLs and safety is an absolute priority.

**THE EAST MIDLANDS RADAR 1 CONTROLLER** reports operating as a mentor to a trainee as the DHC8 was being vectored for a straight-in approach for RW09 from the NW. A 7000 squawk with NMC was observed manoeuvring to the W of East Midlands and it was believed to be below the CTA, the base level of which is 1500ft. No RT call was received from this flight and no ac were thought to be lost in the vicinity. The DHC8 was descended to 2000ft and was placed on a heading to intercept the ILS. The 7000 squawk changed to a Birmingham code of 0401 still with NMC so the controller requested TI from Birmingham. The ac's c/s was given, the PA28, and that it was believed to be at 2500ft. The Birmingham Radar controller, on observing the position of the ac, instructed the flight to vacate East Midlands' airspace to the W and transferred the ac to East Midlands' frequency. Once the level of the 0401 traffic was established it was called to the DHC8 flight and the crew became visual with the ac; they were passing abeam the PA28 by 0.25nm at 3300ft descending to 2000ft. The DHC8 crew had the PA28 on TCAS as proximate traffic and then a TA but did not query this on the frequency. The PA28 pilot was unaware of being within East Midlands CAS when calling Birmingham and both the pilot and Birmingham ATC had difficulties in hearing each other, possibly due to their range.

**ATSI** reports that the Airprox occurred at 1558:55 UTC, 10nm WNW of East Midlands Airport, within the East Midlands Control Area CTA-5, Class D airspace, which extends from an altitude of 1500ft to an altitude of 5500ft.

The DHC8 was inbound to East Midlands Airport, operating IFR from Belfast City and in receipt of a RCS from East Midlands Radar. The PA28 was operating VFR on a local flight from Wellesbourne Mountford and was in receipt of a BS from Birmingham Radar.

CAA ATSI had access to RT recording of East Midlands Approach and Birmingham Approach; area radar recordings; written reports from both pilots and both controllers. The QNH used by the radar system was the same as the East Midlands QNH, 1017hPa.

The METARS for East Midlands and Birmingham Airports are provided:  
EGNX 131550Z 07008KT 9999 FEW020 13/09 Q1017= and EGBB 131550Z 17005KT 130V200 9999 FEW045 16/07 Q1016=

At 1553:23, the DHC8 flight contacted East Midlands Radar in the descent to FL80, in receipt of information 'Q'. The controller asked the DHC8 crew to squawk ident and advised of vectors for the ILS RW09, new information 'R' with no significant changes from 'Q' and 32nm from touchdown. The DHC8 was given further descent to 6000ft on a new QNH, 1017.

At 1555:18, the DHC8 was 24.6nm NW of East Midlands Airport. The PA28 was squawking 7000, with NMC, 10.5nm SW of East Midlands and crossing the lateral boundary of the East Midlands CTA-5 (base 1500ft), on a NE'ly track.

At 1555:20, the DHC8 flight was placed on a heading of 115° to take the ac around gliding activity on the extended approach to RW09. At 1555:52, the DHC8 crew was advised 22nm from touchdown and given descent to 5000ft.

At 1556:52, the PA28 pilot contacted Birmingham Radar requesting zone transit. The Birmingham controller instructed the PA28 to squawk 0401 and to standby for transit. The PA28 was 9.5nm W of East Midlands Airport, within the lateral confines of CTA-5. The PA28 was observed to take up a LH orbit.

At 1556:56, the DHC8 crew was advised 17nm from touchdown, descended to 4000ft and shortly afterwards was given further descent to 3000ft.

At 1557:27, the squawk of the PA28 was observed to change to the Birmingham code 0401, as the PA28 continued in the LH orbit leaving and then re-entering the lateral confines of CTA-5.

At 1558:14, the DHC8 was turned R heading 130° to report LOC established and descended to 2000ft.

The East Midlands controller reported observing the unknown ac change squawk from the 7000 to 0401 and asked the Radar 2 controller to obtain altitude information on this ac from Birmingham Radar.

At 1558:20, the Birmingham controller asked the PA28 pilot, *"Report your altitude"* and there was no response.

At 1558:23, radar recording shows the distance between the 2 ac was 3.2nm. The DHC8 was indicating an altitude of 3900ft and the PA28 was not indicating Mode C level reporting.

At 1558:30, the Birmingham controller transmitted, *"(PA28 c/s) you're inside er you're very close to East Midlands I suggest you give them a call on one three four decimal one seven five"* and again there was no response.

At 1558:42, the Birmingham controller called again, *"(PA28 c/s) Birmingham"* and the pilot replied, *"(PA28 c/s)."* The distance between the 2 ac was 2.1nm, with the DHC8 at 3700ft and the PA28, without Mode C level reporting, in the LH orbit towards the DHC8. The controller responded, *"(PA28 c/s) what is your altitude."* The PA28 pilot replied, at 1558:55, *"Two thousand five hundred feet."*

The East Midlands controller then became aware of the PA28 level (2500ft) and at 1558:56, transmitted, *"(DHC8 c/s) I may have traffic just passing behind you at the moment possibly two thousand five hundred feet er it's unverified."* The DHC8 pilot responded, *"er we're visual er (DHC8 c/s)."*

At 1558:55, the 2 ac passed abeam on reciprocal tracks at a range of 1.1nm (CPA). The DHC8 was at an altitude of 3400ft and the PA28 was passing through a heading of 300° without Mode C level reporting. The PA28 continued the L turn leaving and then re-entering the confines of CTA-5.

At 1559:12, the Birmingham controller transmitted, *"(PA28 c/s) route to the west you're inside East Midlands airspace they have traffic just er passing you now three thousand feet in the descent call East Midlands on one three four decimal one seven five."*

At 1600:10, the DHC8 crew reported established on the LOC and was cleared for descent on the GP and transferred to the Tower on 124.0MHz.

At 1600:25, the PA28 pilot contacted East Midlands Radar on transfer by Birmingham and was instructed to squawk 4552. At this point the SSR code is lost from the area radar recording and the PA28 is shown as a primary only contact. The PA28 was observed to make a R turn tracking SW, leaving the lateral boundary of CTA-5 at 1601:14, crossing into the lateral confines of CTA-13 (base 2500ft).

At 1602:57, the PA28 pilot reported routeing to Derby and then to Wellesbourne Mountford. The East Midlands controller responded, *"(PA28 c/s) you gonna no further east of your present position er you're just at two and half thousand feet inside our zone just."* The PA28 pilot read-back, *"two thousand er feet (PA28 c/s)"* and *"(PA28 c/s) we are heading er two seven zero ??????"*

At 1603:52, the East Midlands controller advised the PA28 pilot that transmissions were very weak and asked for confirmation that the PA28 was heading W. The PA28 pilot was subsequently asked

to squawk 7000 and transferred to en-route. The PA28 pilot reported changing to Birmingham on 118.05MHz.

The PA28 pilot's written report indicated that the pilot was unaware that the ac was inside the East Midlands CAS.

The DHC8 was inside CAS and in receipt of a RCS from the East Midlands Radar controller. The Manual of Air Traffic Services (MATS) Part 1, Section 1, Chapter 5, Page 12, paragraph 13.1.4, states:

'...aircraft operating in controlled airspace are deemed to be separated from unknown aircraft in adjoining uncontrolled airspace...'

and paragraph 15.1 and 15.2 state:

'A position symbol which cannot be associated with an aircraft known by the controller to be operating within the airspace concerned shall be considered to represent an unknown aircraft.'

The action to be taken by controllers when they observe an unknown aircraft, which they consider to be in unsafe proximity to traffic under their control, in various types of airspace is as follows:

Class D: If radar derived, or other information, indicates that an aircraft is making an unauthorised penetration of the airspace, is lost, or has experienced radio failure:

IFR flights shall be given avoiding action and traffic information shall be passed.'

The unknown traffic (PA28) was shown on radar without Mode C level reporting and there was no radar derived or other information to indicate that this contact had entered CAS. Both East Midlands and Birmingham Radar controllers could reasonably have expected the unknown 7000 squawk, without any Mode C level reporting, to be below the base of CAS.

Ten seconds before the CPA occurred the pilot reported at 2500ft. The Birmingham Radar controller then advised the PA28 pilot that he was inside CAS, gave TI and instructed the pilot to route W and to contact East Midlands.

The East Midlands controller, having observed the squawk change to Birmingham 0401, asked the Radar 2 controller to make contact with Birmingham, requesting altitude information. This became apparent as the Airprox occurred and the East Midlands Radar controller passed TI to the DHC8 as the 2 ac passed abeam.

For a VFR flight entering Class D controlled airspace, the ANO RoA, Rule 29 (1) states:

'Subject to Rule 31, before an aircraft flies within Class B, Class C or Class D airspace during the notified hours of watch of the appropriate air traffic control unit, the commander of the aircraft shall:

- (a) cause to be communicated to the appropriate air traffic control unit a flight plan which complies with paragraphs (2) and (3) (as appropriate); and
- (b) obtain an air traffic control clearance to fly within that airspace.'

The Airprox occurred as a result of the PA28 entering CAS without a clearance.

There was no radar derived or other information to indicate that the unknown traffic (PA28) had entered CAS and the controllers at Birmingham and East Midlands regarded the unknown contact as being outside CAS, below the base of East Midlands CTA-5.

It only became apparent that the PA28 was in CAS as the Airprox occurred and both controllers passed TI to their respective ac.

## **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.

A CAT pilot Member commented that it was not uncommon for CAT traffic flying in CAS to receive a TCAS TA on traffic operating legitimately beneath CTA 'stubs' whilst displaying NMC. This alert was treated as a prompt to look out for possible conflicting traffic, mindful that any RA was inhibited owing to lack of relative altitude information. A controller Member remarked that it was normal practice to descend IFR traffic to a level 500ft above the base of CAS during vectoring with this traffic deemed separated from the traffic flying just below the base; however, best practice was not to allow radar returns to touch. There was no radar derived or other information to indicate the PA28 had entered CAS although it was clear from the ATSI investigation report that the PA28 had entered CAS without clearance, the infringement only becoming apparent to ATC immediately prior to the CPA. Despite the Birmingham controller passing the information to the East Midlands controller as soon as he became aware, there was only enough time to pass TI to the DHC8 crew as the ac passed abeam. The Board agreed that both Birmingham and East Midlands ATC had done the best they could in the circumstances. Pilot Members agreed that the Airprox was down to poor planning at the outset with the PA28 pilot apparently using an out of date chart and attempting to use a navaid that had been withdrawn from service 2 years previously. Given the vagaries of NDB/ADF tracking, pilot Members were acutely aware of the need to follow SOPs when practising I/F, particularly ensuring the nav beacon is identified prior to using the ADF instrument indications for navigation. This brought into question the supervisory aspects by the Instructor. The pilot was under the impression that this was an instructional flight, which was contrary to the Instructor's viewpoint. Members agreed that this difference of understanding indicated a breakdown in CRM; it highlights the vital importance of pre-flight briefings to establish a common understanding of each pilot's responsibilities in the cockpit. Notwithstanding that the PA28 pilot's misunderstanding of the Instructor's role, by not intervening as the ac was orbiting within the East Midlands CTA while the pilot was attempting to call Birmingham for transit, it appeared that both pilots were unaware of the unauthorised penetration. This incursion led to the PA28 flying into conflict with the DHC8 which neither pilot had seen, further compounding the infringement.

The DHC8 crew was aware of the PA28's presence from TCAS but were ignorant of its altitude owing to its NMC until seeing it pass clear to their R and below as East Midlands Radar passed TI. One pilot Member thought that with any TCAS resolution inhibited there had been no other safety barriers remaining, and therefore safety was not assured. This view was not shared by the majority who felt that although this had had the potential for a more serious incident, the ac were not on conflicting flightpaths. The PA28 was orbiting L, on the boundary where the base level of the CTA changed from 2500ft to 1500ft, whilst the DHC8 flight was following vectors to intercept the RW09 ILS and was in a descent profile to ensure it remained within CAS. Its actual flight profile led to it descending through 3400ft as it passed abeam the PA28, whose pilot had just reported level at 2500ft, 900ft below the DHC8, with lateral separation of 1.1nm at the CPA and the ac diverging. These elements were enough to allow the Board to conclude that there had been no risk of collision during this encounter.

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

Cause: The PA28 pilot entered CAS without clearance and flew into conflict with the DHC8, which she did not see.

Degree of Risk: C.