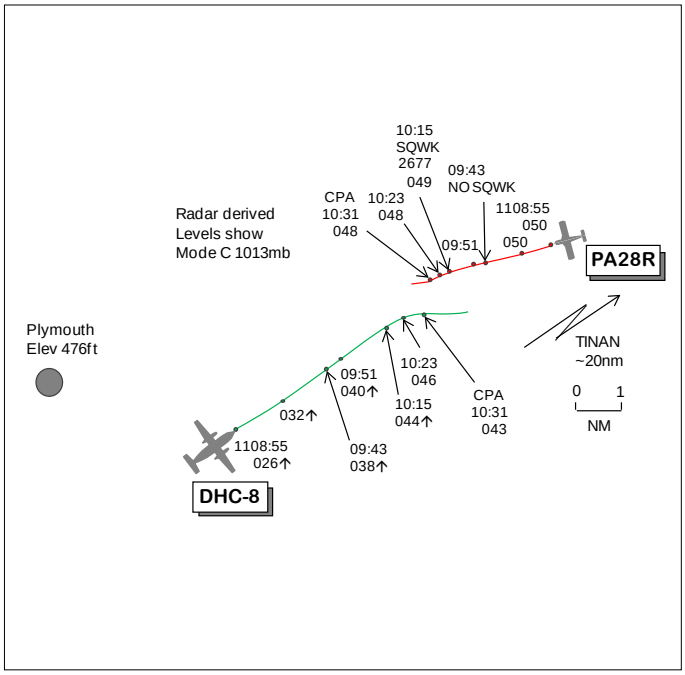
AIRPROX REPORT No 2010136

Date/Time:	19 Sep 2010 1111Z (Sunday)	
Position:	5028N 00354W (8·5nm ENE Plymouth)	
Airspace:	LFIR	(*Class: G*)
	Reporting Ac	*Reported Ac*
Type:	DHC-8	PA28R
Operator:	CAT	Civ Pte
Alt/FL:	FL45↑	FL50
Weather:	IMC NR	VMC CLAC
Visibility:	NR	10km
Reported Separation:	200ft V/NR H	Not seen
Recorded Separation:	500ft V/0·8nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE DHC-8 PILOT reports departing Plymouth under IFR and in receipt of a PS from Plymouth Approach on 133·55MHz, squawking1407 with Modes S and C. The Wx was layered cloud, SCT to BKN but improving towards the S Coast. Both RWs were in use and they elected to use RW13 for departure. On taxying out they received the initial clearance to make a R turn out (through 300°), rather than a L turn that was expected before setting track to TINAN, owing to traffic passing through the climb out from W to E. However, the taxy phase took longer than expected resulting in the transit ac having passed well to the E, thus the R turn out was cancelled. They took off from RW13 and made a L turn towards TINAN onto heading 065° at 150kt. Approach asked for them to call passing 3000ft but as they did the frequency was busy with another flight transmitting. Passing FL45 heading 065° and 150kt an open cyan diamond (not depicted as proximate traffic) suddenly appeared on the TCAS screen in their 12 o'clock range 2·25nm and 1100ft above. It appeared so suddenly it was as if the ac's transponder had just been switched on. This coincided with another flight checking in on the frequency for the first time and being assigned a squawk of 2677. He pointed this out to the FO, PF, and within seconds it had changed to a 'descend' RA with a green arc demanding a ROD of 1000-1500fpm. The RA was followed with a R turn being initiated as it seemed as though the traffic was opposite direction. The other ac passed 200ft above and clear to their L. Normal flight was resumed following satisfactory resolution. He assessed the risk as high. He commented that the TCAS display went from clear of ac to 'other traffic' to full blown RA with exceptional speed, certainly not appearing to represent a closing speed of circa 300kt. After speaking to the ATCO, it appears that London Military saw the potential confliction either by PSR or SSR and had luckily taken the initiative to contact Plymouth Approach, asking if they were aware of the traffic. Plymouth ATC was not aware of this traffic and about this time the flight made its initial call. Plymouth immediately asked the flight to squawk conspicuity before informing the crew of the traffic to the E. It appeared to him that the ac's transponder was selected on at this stage but this was only his perception of events, and it was at this stage the RA occurred.

THE PA28R PILOT reports en-route to Newquay via St Austell VFR and had just established contact with Plymouth Approach on 133·55MHz and been issued a 2677 squawk; immediately prior to this he had been receiving a service from Exeter on an assigned squawk. The visibility was 10km flying 100ft above cloud in VMC and the ac was coloured blue/white with strobe lights and beacon switched on. The incident occurred about 8nm ENE of Plymouth when he was heading 255° at 120kt and

FL50. He did not see the other traffic but was later told that it had been climbing through cloud from below on a reciprocal heading.

THE PLYMOUTH APPROACH/AERODROME CONTROLLER reports the DHC-8 had initially been issued with a CAS joining clearance from Swanwick Sector 6/9 and was also pre-noted to London Military who had agreed to provide a radar service outside CAS. The London Mil controller had been passed the airways joining clearance and had issued a radar clearance for the flight to route direct to TINAN climbing to FL120 together with a London Mil squawk. He had originally instructed the flight to make a R turn out after departure to ensure separation from a VFR SR22 joining LH downwind from the Ivybridge VRP, approximately 7nm SE of Plymouth. He also told London Mil of this but owing to minor delays caused by other traffic, the SR22 had actually joined the visual cct before the DHC-8 was ready for departure and therefore the crew was offered a more expeditious L turn after departure, which was accepted. London Mil was updated with this information. Once the DHC-8 was airborne, he instructed the flight to report on track TINAN and passing altitude 3000ft in the climb to ensure that the ac would be above MSA on transfer to London Mil. He then dealt with some other traffic and this may have prevented the DHC-8 crew from reporting passing 3000ft. At about this time London Mil telephoned, being under the impression that the DHC-8 was still on the ground, to ask if he was working any traffic to the E of Plymouth with Mode A 7000 indicating FL50. He told London Mil that he was not controlling any traffic in the area and, as London Mil did not appear concerned and did not amend the radar clearance, he felt that London Mil would be best placed to separate the ac on radar. He informed London Mil that the DHC-8 was airborne and would be contacting them shortly. Almost simultaneously he received an initial call from the PA28R pilot giving his details and requesting a BS. He noticed from its DF QDM that the ac appeared to be close to the planned track of the DHC-8 so he instructed the flight to squawk 2677 (Plymouth Conspicuity Code) to ensure that the ac would appear on the DHC-8's TCAS and would also be seen by London Mil. He also passed TI on the DHC-8 to the PA28R pilot. He then requested the passing level of the DHC-8, which was FL40, and passed TI on the PA28R which the crew acknowledged. About 30sec later the DHC-8 crew reported that he had received a TCAS TA and would be filing an Airprox. He acknowledged the call and having ascertained that the 2 ac had passed each other, he transferred the DHC-8 flight to London Mil. He then informed London Mil and the PA28R pilot that an Airprox would be filed. Subsequent discussions with the DHC-8 Capt revealed that the PA28R did not appear on the TCAS display until he had instructed the PA28R flight to squawk 2677, which then generated an RA, not a TA as previously notified. In addition London Mil believed that there was a primary only contact to the E of Plymouth, not the Mode A 7000 Code that was previously mentioned. He had no way to establish the exact identity of the ac concerned but this would be consistent with the lack of ac return on the DHC-8 TCAS display.

ATSI reports that the Airprox occurred at 1110:31, 8·5nm to the ENE of Plymouth Airport, in Class G airspace, between a DHC-8 and a PA28R.

The DHC-8 was an IFR flight from Plymouth to Newcastle, routeing to join CAS on track TINAN, situated 29nm to the NE of Plymouth Airport. Prior to the DHC-8 departure, an airways clearance was obtained from London Swanwick Sector 6/9 and the departure was pre-noted to London (Swanwick) Military Radar (London Mil).

The PA28R was a VFR flight from Headcorn to Newquay routeing via St Austell. The PA28R was transferred to Plymouth Approach from Exeter Radar and was in receipt of a BS. The Exeter Manual of Air Traffic Services (MATS) Part 2, Page 109, states: '...when Plymouth Military Radar is not available, IFR aircraft ……to overfly Plymouth, are to be co-ordinated with Plymouth.' There is no requirement for Exeter to coordinate VFR traffic.

Plymouth were providing a combined Aerodrome and Approach Control Service without the aid of surveillance equipment. A Plymouth conspicuity SSR code A2677 is allocated to Plymouth traffic operating under both a BS and PS.

During weekday periods Monday to Friday, a LARS service is provided by Plymouth Military Radar. However, the Airprox occurred on a Sunday and London Mil had agreed to provide a radar service to

the DHC-8, when above FL40. The standard practice requires that Plymouth Approach transfer such traffic to London Mil after passing an altitude of 3000ft.

METAR EGHD 191050Z 21009KT 9999 BKN011 15/13 Q1017=

Prior to the departure of the DHC-8, a clearance was requested from London Swanwick Sector 6/9. London Control cleared the DHC-8 to join CAS on track TINAN in the climb FL120, to be FL80 or above prior to entering CAS, squawk 1407 and frequency 126·075MHz.

London Mil agreed to provide a radar service prior to the DHC-8 joining CAS. The airways joining clearance was pre-noted to the London Mil controller and the climb to FL120 was approved, with a squawk 3353 and frequency 135·150MHz.

At 1102:27 the Plymouth controller passed the DHC-8 an airways joining clearance and the local departure clearance from London Mil. These clearances were correctly read back and the DHC-8 departed at 1107.

At 1107:34 the DHC-8 was instructed, *"(DHC-8)c/s report on track TINAN passing three thousand feet in the climb."* The controller's written report indicated that at the same time, the London Mil controller, under the impression that the DHC-8 was not yet airborne, asked Plymouth if they were working traffic to the E indicating FL50. In response the Plymouth controller replied that they were not working the unknown traffic and confirmed that the DHC-8 was now airborne. At this point the DHC-8 was not displayed on the London Mil radar display and there was no discussion regarding any potential conflict.

At 1107:59 the radar recording showed the PA28R, at a position 13·8nm to the ENE of Plymouth Airport, displaying a squawk of 7000 and indicating FL049.

Just under 1min later at 1108:55, the radar recording showed the DHC-8 first appearing on radar 4·3nm E of Plymouth Airport, displaying the London Mil squawk 3353 and indicating FL026 whilst the PA28R was shown 8nm NE of the DHC-8 and indicating FL050.

At 1109:00, the PA28R flight called Plymouth Approach, followed at 1109:10 with the flight details, *"Good afternoon (PA28R)c/s P A twenty eight R routeing from Headcorn to Newquay er currently ten miles to the eastnortheast of your airfield and we'd like to route through your overhead currently flight level five zero er request a Basic Service PA28R c/s."* Approach replied, *"(PA28R)c/s roger Basic Service squawk two six seven seven."* As soon as the pilot gave a correct readback Approach passed TI, *"(PA28R)c/s report approaching the overhead traffic for you is a Dash eight just departed Runway one three with a left turn out towards the airway climbing Flight level one two zero."* The readback from the pilot was distorted due to a crossed transmission.

At 1109:55, in response to a request from Approach, the DHC-8 pilot reported, *"er passing level four zero now (DHC-8)c/s"* and Approach responded with, *"(DHC-8)c/s there's traffic just called me is a P A twentyeight ten miles to the northeast of the airfield flight level five zero just come on my squawk now."* This is acknowledged by the DHC-8 pilot.

[UKAB Note (1): Meanwhile the radar sweep at 1109:43 shows the PA28R as a primary only return, the transponder having faded from the radar probably as the pilot was changing to the Plymouth conspicuity code. The 2 ac are on reciprocal tracks with separation of 4·3nm, the DHC-8 was indicating FL038.]

The PA28R pilot's written report indicated that the PA28R was VFR and 100ft above cloud. The DHC-8 was climbing IMC. At 1110:15, radar recording showed the SSR code of the PA28R had reappeared, displaying a squawk 2677, indicating FL049 and the DHC-8 was indicating FL044; both ac were on reciprocal tracks and the distance between the ac was 1·9nm.

At 1110:25 the DHC-8 pilot advised, *"Er (DHC-8)c/s we had erm a TA there".* Radar recording shows the distance between the ac as 1·3nm, the DHC-8 indicating FL046 and the PA28R indicating FL048.

[UKAB Note (2): The CPA occurs at 1110:31, the radar recording shows both ac 8·5nm ENE of Plymouth Airport with the DHC-8 now having descended indicating FL043 and in a R turn passing 0·8nm S of, and 500ft below, the PA28R indicating FL048.]

When questioned, the Plymouth controller considered that in hindsight, with the limited knowledge and information provided by London Mil, a warning about the unknown traffic, passed earlier to the crew of the DHC-8, would have aided their SA.

The ATSU has indicated that the unit have been proactive in trying to improve the flight safety for commercial operations. Prior to this incident a feasibility study was undertaken to consider four options for the provisions of radar environment for Plymouth airport. This is well advanced and a report is likely to make recommendations in the near future.

The DHC-8 was in receipt of a Procedural Service and the Plymouth controller passed traffic information regarding the PA28R that was VFR and in receipt of a Basic Service. The MATS Part1, Section 1, Chapter 11, Page 10, paragraph 6, states:

> 'A Procedural Service is an ATS where, in addition to the provisions of a Basic Service the controller provides restrictions, instructions and approach clearances, which if complied with, shall achieve deconfliction minima against other aircraft participating in the Procedural Service. Neither traffic information nor deconfliction advice can be passed with respect to unknown traffic.'

Paragraph 6.5, states:

> 'The controller shall provide traffic information, if it is considered that a confliction may exist, on aircraft being provided with a Basic Service and those where traffic information has been passed by another ATS unit; however, there is no requirement for deconfliction advice to be passed, and the pilot is wholly responsible for collision avoidance. The controller may, subject to workload, also provide traffic information on other aircraft participating in the Procedural Service, in order to improve the pilot's situational awareness.'

The PA28R in receipt of a BS was passed a warning regarding the DHC-8 departure from Plymouth and in the climb to FL120. The MATS Part 1, Section 1, Chapter 11, Page 4, Paragraph 3.1.1, states:

> 'A Basic Service is an ATS provided for the purpose of giving advice and information useful for the safe and efficient conduct of flights. This may include weather information, changes of serviceability of facilities, conditions at aerodromes, general airspace activity information, and any other information likely to affect safety. The avoidance of other traffic is solely the pilot's responsibility.'

CAA ATSI considered that two factors contributed to the late warning of a potential conflict for the DHC-8 pilot:

London Military gave an indication to the Plymouth controller, albeit limited, about unknown traffic at FL050 to the E of Plymouth. The controller considered after the event, that this might have allowed an earlier warning to be passed to the DHC-8 crew to provide greater situational awareness. After the PA28R flight called Plymouth, the controller passed TI on known traffic to the DHC-8. This was 2min after the initial call from London Mil.

The squawk change of the PA28R occurred at a point when the 2 ac were coming into conflict (4·3nm) and this probably contributed to a delay in a TCAS alert to the crew of the DHC-8.

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.

Pilot Members agreed that this was not an unusual occurrence for a CAT flight from an airport outside CAS where the ATSU is not radar equipped. Being Class G airspace there could also have been other traffic flying in the area not talking to any ATSU, possibly non-squawking, maintaining their own separation from other traffic through 'see and avoid'. The PA28R pilot had called Plymouth for a service, thereby making his presence known to the controller and this transmission was also noted by the DHC-8 crew. From the radar recording it was apparent that the PA28R was squawking almost continuously prior to the Airprox, having changed from an Exeter squawk to 7000, except for a period of about 30sec whilst the pilot was switching to the Plymouth code. This unfortunately appeared to have been responsible for its 'pop-up' on the DHC-8's TCAS, although the ac should have been visible earlier as 'other traffic' prior to its SSR outage. Members wondered whether the crew had selected a short display range on their equipment or had adjusted the 'look-up, look down' parameters, which might have exacerbated the situation. It was noted that the PA28R pilot had elected to fly under VFR when flying 100ft above cloud. The UK AIP (ENR 1-2-1) and the RoAR (Rule 28) promulgates that VFR flights shall be conducted in Class G below FL100 so that the ac is flown in VMC, which in this case would require the ac to be 1000ft vertically and 1500m laterally clear of cloud with in-flight visibility of 5000m. Flying just above a cloud layer gives a pilot little chance of discharging his responsibilities for 'see and avoid' against IFR traffic climbing through the cloud layer. Had the PA28R pilot been flying 1000ft above the cloud, it would have given him more time and a better chance to see traffic climbing from below. Also if he had been able to fly under IFR and/or requested a PS, the controller would have applied 1000ft vertical separation between the ac, which would have averted this Airprox.

The London Mil controller had done well by alerting the Plymouth controller to the approaching PA28R and, although this information was not passed on to the DHC-8 crew immediately, the Plymouth controller had discharged his responsibilities by issuing TI to both flights after the PA28R's details became known to him from its pilot's RT call. The DHC-8 crew was aware of the PA28R from TCAS and had correctly followed the RA guidance. It was noted, however that the crew manoeuvred their ac laterally as well, which is not recommended owing to the equipment's known inaccuracies in azimuth. Also, for whatever reason, the crew only reported a TCAS TA alert on the RT whereas the 'RA' and 'clear of conflict' should have been broadcast. Owing to the layer of cloud, neither crew was able to visually acquire the other ac, which led Members to classify this as a conflict in Class G airspace. However, the Board agreed unanimously that the actions taken by the DHC-8 crew and ATC were enough to remove any risk of collision.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A conflict in Class G airspace resolved by the DHC-8 crew using TCAS.

Degree of Risk: C.