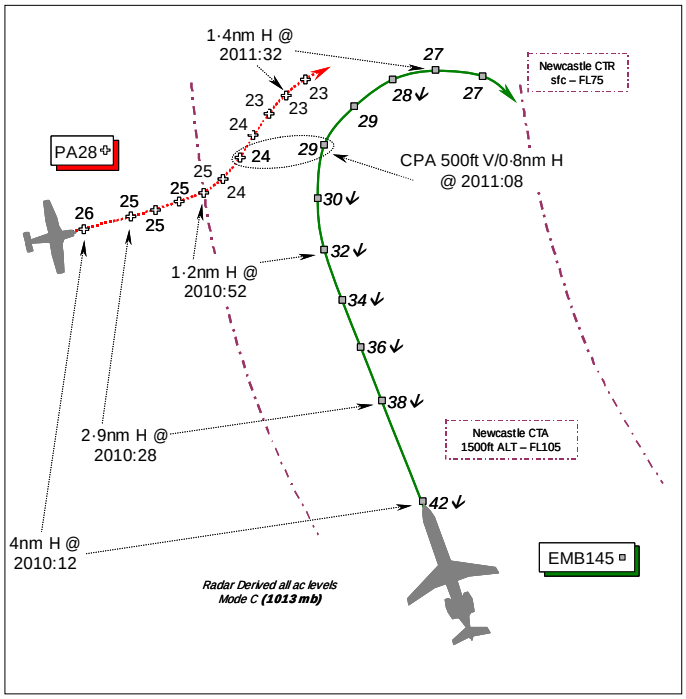
AIRPROX REPORT No 2010010

Date/Time:	2 Mar 2010 2011Z	NIGHT
Position:	5501N 00158W (10nm W of Newcastle- elev 266ft)	
Reporter:	Newcastle APR	
Airspace:	Newcastle CTA	(*Class:* D)
	Ac 1	*Ac 2*
Type:	EMB145	PA28A
Operator:	CAT	Civ Trg
Alt/FL:	4000ft↓	3000ft QNH (1018mb)
Weather:	VMC NR	VMC NR
Visibility:	NR	30km
Reported Separation:		
	Not seen	1000ft V/½nmH
Newcastle APR		700ft V/1nm H
Recorded Separation:		
	500ft V @ 0·8nm H	



CONTROLLER FILED

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE NEWCASTLE APPROACH RADAR CONTROLLER (APR) reports that she was vectoring the EMBRAER145 (EMB145) to the ILS for RW07 from the S under a RCS. Due to survey traffic underneath she was unable to give a standard descent profile, so planned to take the EMB145 through the LLZ to close from the L. Once the EMB145 was clear of this traffic, descent was given to 2200ft QNH (1026mb). Meanwhile a PA28 pilot flying N of Hexham outside CAS asked for a SVFR rejoin, but due to traffic was told to standby. The PA28 was orbiting just to the W of the CTA boundary. Although intending to turn the EMB145 to close the LLZ just as the ac crossed the final approach, she transmitted the instruction to the wrong callsign. At this point the PA28 infringed the CTA boundary without clearance. The EMB145 crew was instructed to stop descent at 3000ft QNH and given a R turn; the PA28 pilot was passed TI and told to make a L turn to keep clear of the EMB145. At this point STCA was triggered but the SSR labels had merged so she was unable to see the respective Mode C indications. Minimum separation was 700ft vertically and 1nm horizontally.

The Newcastle 1950UTC METAR was: 250/02kt; 30km; FEW3500 Temp M01/M03; QNH 1026mb. TYNE RPS: 1021mb.

THE EMB145 PILOT provided a brief account. He reports flying inbound to Newcastle under IFR and in receipt of a RCS from Newcastle APPROACH (APR) on 124·375MHz. A squawk of A5763 was selected with Mode C on.

Whilst in receipt of radar vectors towards a long right hand base leg to RW07 at 210kt, the controller advised of VFR traffic [the PA28] approaching from the NW and issued a R turn to intercept the LLZ RW07 for a normal approach. The other ac was shown on TCAS, but he did not provide an estimate of the minimum separation. The Risk was not assessed.

THE PIPER PA28 PILOT reports he was on a local instructional flight from Newcastle to Bamburgh and return, whilst in receipt of an ATS from Newcastle APP. The assigned squawk was selected with Mode C on.

Flying at an altitude of 3000ft in VMC, he advised APP that he would be routeing around the northern perimeter of the Newcastle CTR/CTA, outside CAS, to Hexham [a VRP situated 257°NEW15nm] and was instructed by ATC to report at Hexham. About 3nm N of Hexham he called APP to report his position, but was instructed to 'standby' so he commenced a rate 1 (3°/sec) LH orbit. He could see a northbound passenger jet [the EMB145] above his ac, which he had spotted at a range of about 15nm and whose crew had asked the controller if his PA28 was under the control of APP. The controller advised the EMB145's crew that his PA28 was orbiting outside CAS. No avoiding action was taken as he assumed there was sufficient vertical separation and the EMB145 passed about 1000ft above his PA28 and ½nm away to starboard. He assessed the Risk as 'none'. Still flying at 3000ft, he subsequently routed back around the northern edge of the CTR changed to TOWER and then landed at Newcastle.

His ac has a white colour-scheme and the HISL was on.

ATSI reports that the Newcastle Approach Radar positions were combined. Although the controller described the traffic loading as medium at the time of the Airprox, the workload was considered as high, mainly due to the presence of a survey ac in the airspace close to final approach of the runway in use - RW07.

The EMB145 crew established communication with Newcastle APP at 2002, passing FL163 descending to FL90, towards NATEB (Newcastle Airport), within Class G airspace some 10·6nm ENE of Durham Tees Valley Airport. The flight was identified and the pilot was informed that it would be vectoring to the ILS for RW07, under a DS, which was read-back correctly. Subsequently, the aircraft was turned left heading 295° and issued with descent to FL70. The radar recordings show the EMB145, passing FL92, entering CAS (Class D of Airway P18) at 2006:10. The vertical dimensions of the airway in the vicinity, 16nm SSE of the airport, are notified as FL55-FL125. The pilot was not advised he was entering CAS or the ATC service was being changed. The MATS Part 1, Section 1, Chapter 5, Page 1, 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'.

It is not considered that this omission was a causal factor to the Airprox. The aircraft remained within Class D CAS for the remainder of the flight i.e. respectively P18, the Newcastle CTA and CTR. A further change of heading to 310° and descent to an altitude of 5000ft was instructed at 2006:50. By now, the EMB145 was passing FL82 14·3nm S of the airport. The survey ac, referred to earlier was routeing SW from the airport at 3500ft. The controller's plan was to position the EMB145 above this ac and issue further descent when the two ac had passed each other.

At 2007:58, the pilot of the PA28 called the APR reporting *"2 miles north of Hexham request rejoin".* The ac had previously departed from Newcastle squawking A3750 and had routed around the northern boundary of the CTR, retaining the allocated Newcastle code. The APR replied, "[PA28 C/S] *stand by"*. The MATS Part 1, E (Attach), Page 2, states the appropriate phraseology:

> 'Remain outside controlled airspace. Time is (minutes). Expect joining clearance at (time).'

The APR stated that she would normally instruct an aircraft to remain clear of CAS if it was not possible to issue an entry clearance straight away. On this occasion, she did not carry out this action because her intention was to issue a joining clearance soon afterwards. She commented that she just needed a short time to formulate a suitable routeing to ensure that the PA28 would remain separated from the inbound EMB145. In the event, the APR became occupied with other traffic and did not return her attention to the PA28 as intended. The radar photograph, timed at 2007:58, shows

the PA28 - squawking A3750 - tracking SW some 13nm W of Newcastle airport indicating 2600ft Mode C (1013mb) [equating to an altitude of about 2990ft QNH (1026mb)].

In view of the survey traffic, which would be crossing the EMB145's track, the APR advised, "[EMB145 C/S] *I do have traffic in your 3 o'clock 2 miles which is affecting your descent I'll take you through the final approach track to close from the left turn right heading..3-4-0 degrees"*. The pilot reported sighting the traffic on TCAS. Once clear of this traffic, the EMB145 crew was instructed, at 2009:42, to descend to 2200ft QNH. The radar recording shows the aircraft 10·5nm SW of the airport at 4700ft (1013mb) [5090ft QNH], within the Newcastle CTA, where the base is 1500ft amsl. The PA28 is shown tracking E, 2nm from the boundary of the same part of the CTA, indicating 2600ft (1013mb) [about 2990ft QNH]. The controller considered that, although the EMB145 would have to be taken through the LLZ to position the ac from the N, it would only be for a short distance and it would not conflict with the PA28. The APR intended to instruct the EMB145 crew to turn onto a closing heading for the ILS, however, at 2010:16, she passed the instruction to another ac, which was tracking S, further to the W. Both aircraft were squawking Newcastle assigned SSR codes that were not callsign converted. Realising her error, the APR cancelled the clearance with the other ac and at 2010:33, instructed the EMB145 crew to, *"stop descent altitude three thousand feet right heading 1-1-0 degrees report established"*. However, she realised that this was not an appropriate heading to position the EMB145 to final approach and later amended it to heading 160° for a base-leg. Explaining that she had just repeated the instruction issued to the incorrect flight, she realised that the EMB145 would route further through the FAT than originally considered and that the PA28 was entering CAS in its vicinity.

[UKAB Note (1): The radar recording at 2010:28, shows the EMB145 passing through the FAT, descending through 3800ft (1013mb) [about 4190ft QNH], 9·9nm from the airport. The PA28, which was still outside CAS but tracking E, 0·6nm from the CTA boundary, at 2500ft (1013mb) [about 2890ft QNH] and 2·9nm NW of the EMB145.]

The APR assumed, incorrectly, that the pilot of the PA28, expecting the usual clearance to join Special VFR of not above 2500ft ALT, would have descended to that altitude already. Consequently, to achieve at least 500ft vertical separation, she decided to stop the EMB145's descent at 3000ft ALT. She did not notice that the PA28 was at an equivalent altitude of about 2890ft. With hindsight, she realised that she should have instructed the EMB145 to stop its descent as soon as possible. At 2011:00, just after the PA28 crossed the CTA boundary at 2500ft (1013mb) [about 2890ft QNH], the PA28 pilot was advised, *"you may see inbound IFR traffic in your 12 o'clock if you can make a left turn just to keep out the way please he is stopping descent"*. The pilot replied *"wilco"*. The phrase 'avoiding action' was not used to either flight and the pilot of the EMB145 was not informed about the presence of the PA28. The controller commented that the SSR returns of the two ac were overlapping. Although it is possible on the radar display to centre-in to an area at an expanded scale, which would allow the SSR returns to be segregated, she did not carry out that process.

[UKAB Note (2): At 2010:52, the subject ac were on conflicting tracks 1·2nm apart, the EMB145 descending through 3200ft (1013mb) [about 3590ft QNH], 700ft above the PA28 which was crossing the CTA boundary indicating 2500ft (1013mb) [2890ft QNH]. The CPA of 0·8nm occurred at 2011:08, as the EMB145 was turning R indicating 2900ft (1013mb) [about 3290ft QNH), crossing ahead of the PA28 from R – L, which was in a L turn at 2400ft (1013mb) [about 2790ft QNH]. Both ac were within the CTA at the CPA; the EMB145 being just over 1nm from the western CTA boundary. Newcastle ATC has been authorised by the CAA to use 3nm horizontal radar separation.]

The MATS Part 1, Section 1, Chapter 5, Paragraph 13.1.14, states the following guidance:

> '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.'

The APR was undoubtedly busy in the period leading up to the Airprox. Another controller was available alongside in the Approach Room and had asked if she required a second radar position to be opened. The APR explained that she had only recently achieved a Certificate of Competence. Whilst training, her mentors had encouraged her not to hand off ac to a second controller, to enable her to practice with more ac on the frequency. She commented that this made her unsure when it was necessary to open another radar position. The RTF recording showed the APR made some uncharacteristic errors in the period, including transmitting an incorrect direction of turn and contacting and responding to incorrect ac. It was reported that another controller had tried to pass advice but the APR did not believe that she had heard his comments, as she was concentrating her attention on resolving the situation. The ATSU have reminded controllers to open the second RADAR position as a matter of course.

A number of factors led to this Airprox. Although the PA28 pilot had not been instructed to remain outside CAS, he did enter the CTA without a clearance. The APR was busy at the time, which meant that she did not return her attention to the PA28 to issue a clearance as intended. This high workload could also explain why she transmitted the turn onto a closing heading, intended for the EMB145 crew, to another flight. Consequently, the EMB145 proceeded further through the LLZ than intended, resulting in a confliction with the PA28, close to the boundary of the Newcastle CTA. It would have been prudent to issue an avoiding action turn and traffic information to the EMB145 crew, which might have led to a speedy resolution of the situation.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac, transcripts of the relevant RT frequency, radar video recordings, reports from the air traffic controller involved and reports from the appropriate ATC authority.

It was clear from the ATSI report that the APR was working under a high workload, albeit perhaps, self-imposed. It was also apparent that assistance was available from her colleague in the ACR if she had chosen to accept his offer to open up another RADAR position. Whilst experienced controller Members recognised that there are occasions when it is counter-productive to split a position because it could increase the need for co-ordination, if the build up of traffic is recognised early enough then it is good practice to split a Sector before it gets too busy. In hindsight, this would have been worthwhile here, especially when unusual flights such as the survey ac are involved that was evidently an added complication. It had been reported that the APR had only recently achieved a Certificate of Competency, so Members questioned whether she was able to judge accurately when help was needed. Here was a reminder to Supervisors/ATCOs-in-charge to guard against situations where newly validated controllers might, inadvertently, allow themselves to be drawn into a difficult situation when it got very busy. A controller Member suggested that better teamwork would have been for another controller to open up the other position without waiting to be asked; the PA28 might then have been simply free-called across earlier, thereby relieving the APR of this added complication.

When the PA28 pilot requested his rejoin from Hexham although the APR was unable to issue a clearance immediately she did not advise him to ‘remain outside controlled airspace’, but she did not return to the PA28’s situation as intended because her attention became focused on other traffic. Some Members questioned the worth of this phraseology, but at face value, it could have prevented this Airprox. The DAP advisor explained that this expression had been debated at great length and was specifically aimed at GA pilots to reduce the potential for inadvertent infringements of CAS; if the APR had not been so busy it she might well have added this caveat.

A significant factor within this Airprox was the APR inadvertently issuing the turn instruction intended for the EMB145 crew to another flight. In human factors terms, the Board considered that this was a sign of a hard-pressed controller and evidently the precursor to this Airprox. Despite the evident Mode C level of the PA28, the APR stopped off the EM145’s descent at a level that did not ensure standard vertical separation above the light ac. The PA28 pilot was evidently a local operator and

thus should have been entirely familiar with the Newcastle CAS. Having flown to Hexham VRP and despite not being told to remain clear of CAS, the pilot should have recognised that he should not set course eastbound into the CTA without being given a specific clearance to enter under Special VFR. No matter that a squawk might be issued and flights identified on radar, pilots must be in no doubt that unless a specific clearance has been issued to enter the CTA/CTR using the words "cleared to enter controlled airspace" pilots must not cross the boundary. As it was, the radar recording revealed that the PA28 pilot crossed into the CTA at about 2890ft QNH at 2010:52, where the base is 1500ft ALT, without a clearance and flew eastbound into conflict with the inbound EMB145 inside Class D airspace. Pilot Members were adamant that there was no room for a mistake here - this was a fundamental principle which should be readily understood by every pilot and especially every instructor. Members agreed unanimously that the cause of this Airprox was that the PA28 pilot entered the Class D Newcastle CTA without clearance.

If the PA28 pilot had remained outside CAS, the APR could have deemed separation to exist between the light ac and the EMB145 that was legitimately manoeuvring inside the CTA. When the conflict became apparent to the APR, the controller merely advised the PA28 pilot, *"you may see inbound IFR traffic…if you can make a left turn just to keep out the way please he is stopping descent"*. It was unfortunate that the APR did not use the phrase 'avoiding action' when the respective turn instructions were issued; a controller Member highlighted that this was significant and stressed that controllers must use this phrase when such action was warranted – it can engender a faster response and ensures pilots are appraised of the reason for the turn which, together with TI, can ameliorate a difficult situation more rapidly. The EMB145 pilot, operating IFR, was not overtly concerned at the situation as he turned in onto the LLZ. The PA28 was shown on TCAS, probably as proximate traffic, but with 500ft of vertical separation at a range of 0·8nm turning L away from the airliner, and no RA was reported. Importantly, the PA28 pilot reported that he had been visual with the EMB145 from a range of about 15nm and, despite the eventual separation being less than ideal, it was clear to the Board that no Risk of a collision had existed in these circumstances.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The PA28 pilot entered the Class D Newcastle CTA without clearance.

Degree of Risk: C.