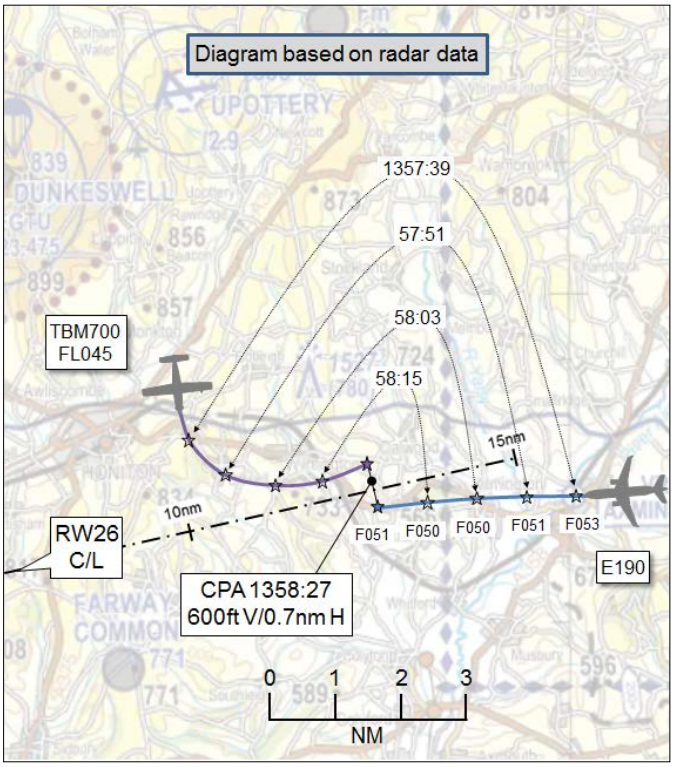
AIRPROX REPORT No 2016236

Date: 13 Nov 2016 Time: 1358Z Position: 5047N 00305W Location: 13nm E Exeter airport

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	E190	TBM700
Operator	CAT	Unknown
Airspace	London FIR	London FIR
Class	G	G
Rules	IFR	VFR
Service	Deconfliction	Traffic
Provider	Exeter	Exeter
Altitude/FL	FL51	FL45
Transponder	A,C,S	A,C,S
Reported		Not reported
Colours	Company	
Lighting	Nav, strobes, landing	
Conditions	VMC	
Visibility	>10km	
Altitude/FL	5500ft	
Altimeter	QNH	
Heading	NK	
Speed	220kt	
ACAS/TAS	TCAS II	
Alert	RA	
Separation		
Reported	400-500ft V/0.25-0.5nm H	NK
Recorded	600ft V/0.7nm H	



THE EMBRAER E190 PILOT reports that he was on a closing heading for the ILS descending through approximately 5500ft to 2600ft. Various traffic advisory contacts were observed on the TCAS display, mainly Mode A, with no altitude indications. ATC called thereafter to stop descent at 3500ft, which was dialled into the flight-guidance panel. ATC RT was heard to various pilots followed by an instruction to stop our descent at FL050 with an avoiding-action left turn. At exactly the same time, 'pop-up' traffic was observed on their TCAS display operating Mode C about 3nm ahead, slightly to the right, 600ft below. A TCAS RA command followed immediately, which the crew actioned with an avoiding climb. Visual contact was made with a single-engine aircraft passing below and to the right at approximately 400/500ft vertical separation. Once clear of conflict, further radar vectors resumed with an uneventful landing onto RW26. Due to the nature of the 'pop-up' Mode C, no TCAS TA was announced on their system.

He assessed the risk of collision as 'Medium' to 'High'.

THE SOCATA TBM700 PILOT elected not to file a report.

THE EXETER APPROACH RADAR CONTROLLER reports that he was vectoring the DHC8 pilot under a Deconfliction Service for an ILS approach to RW26, descending to 2600ft. At 1356 the TBM700 pilot called him, but because he was instructing the E190 pilot to stop his descent at 3500ft against VFR traffic to the north of him (a C172), he was asked to standby. About 15-20 seconds later he noticed a contact climbing out from Dunkeswell heading southbound toward Honiton and into possible confliction with the E190. Guessing it may be the TBM700 [type not known at the time] he asked the pilot to squawk 0423 and, if he was indeed heading south from Dunkeswell, if he could turn to the left and remain to the north of Honiton to stay north of the RW26 Final Approach Track. His

plan was to pass it behind the E190. The pilot of the TBM700 questioned his position thus delaying his turn and getting closer to the E190 than he had anticipated. He only found out later that the departing Dunkeswell aircraft was a TBM700 and not a usual Dunkeswell small light-aircraft. The pilot asked for a Traffic Service and said he was climbing to 5000ft. He passed Traffic Information on the TBM700 to the E190 pilot and, noticing the erosion of separation, instructed the E190 pilot to stop descent at FL050 and gave him an avoiding action left turn of 230°. He was unable to do this any earlier due to an eastbound PA28 which was passing south of the E190 at 4900ft. He asked the TBM700 pilot if he was visual with the E190 to which he replied "affirmative" and he passed down its right-hand side about 600-700ft below. He updated the Traffic Information to the E190 pilot who advised that he had received a TCAS RA and, after a few seconds, called 'clear of conflict'. He proceeded to break-off the E190 pilot and then vector him for another uneventful approach to land.

Factual Background

The weather at Exeter was recorded as follows:

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METAR 131350Z 35008KT 9999 FEW033 12/07 Q1029=
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Analysis and Investigation

CAA ATSI

ATSI had access to the R/T transcript, a recording of the R/T, the area surveillance recordings and reports from both the E190 pilot and the Exeter Radar controller. In addition, the Radar controller was interviewed by ATSI. Screenshots produced in this report are provided using the area radar recordings. Levels indicated are Flight Levels. All times UTC. The E190 (code 0421) was inbound to Exeter and was in receipt of a Deconfliction Service from Exeter Radar. The TBM700 (code 7000/0423) was flying VFR, on a flight from Dunkeswell Aerodrome and was in receipt of a Traffic Service from Exeter Radar on the same frequency.

At 1354:22, the E190 pilot contacted Exeter in the descent to FL060 and routeing to the centre-fix for RW26 at Exeter International Airport. The Exeter Radar controller agreed a Deconfliction Service and advised the E190 pilot that he would provide vectors for an ILS approach.

At 1354:53 (Figure 1), the Exeter Radar controller instructed the E190 pilot (code 0421) to continue on his present heading and advised that this would likely be a closing heading. The controller then requested that the E190 pilot report established on the localiser, but added that, *"I may have to break you off due to the amount of unknowns in the Dunkeswell area".* This information was acknowledged by the E190 pilot.

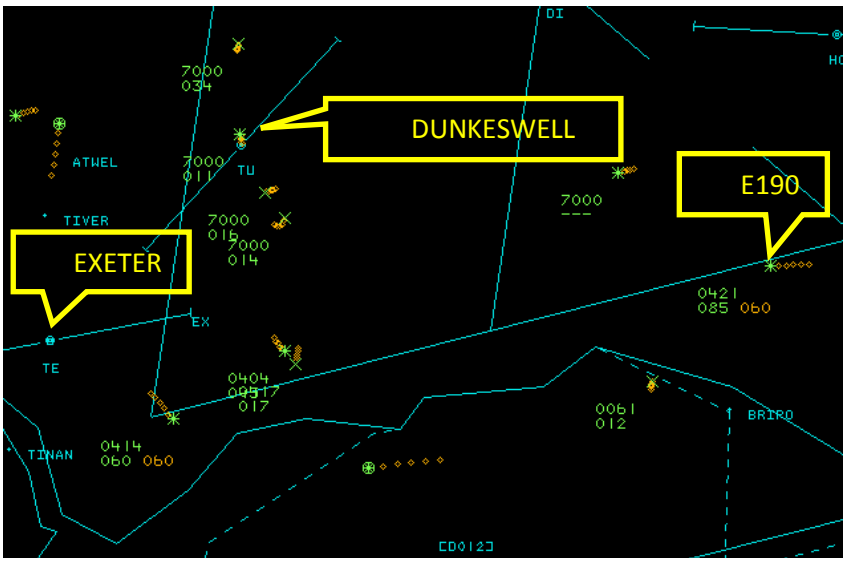


Figure 1 – Swanwick MRT at 1354:53 UTC.

At 1355:45 (Figure 2), a C172 (code 7000) pilot called Exeter Radar, this aircraft was inbound to Exeter VFR from the east. The Exeter Radar controller identified the traffic and a Basic Service was agreed. The radar controller requested that the C172 pilot descend to be not above 2500ft and advised him that the E190 would be descending to a level above him. In response the C172 pilot advised that he would descend to 2300ft.

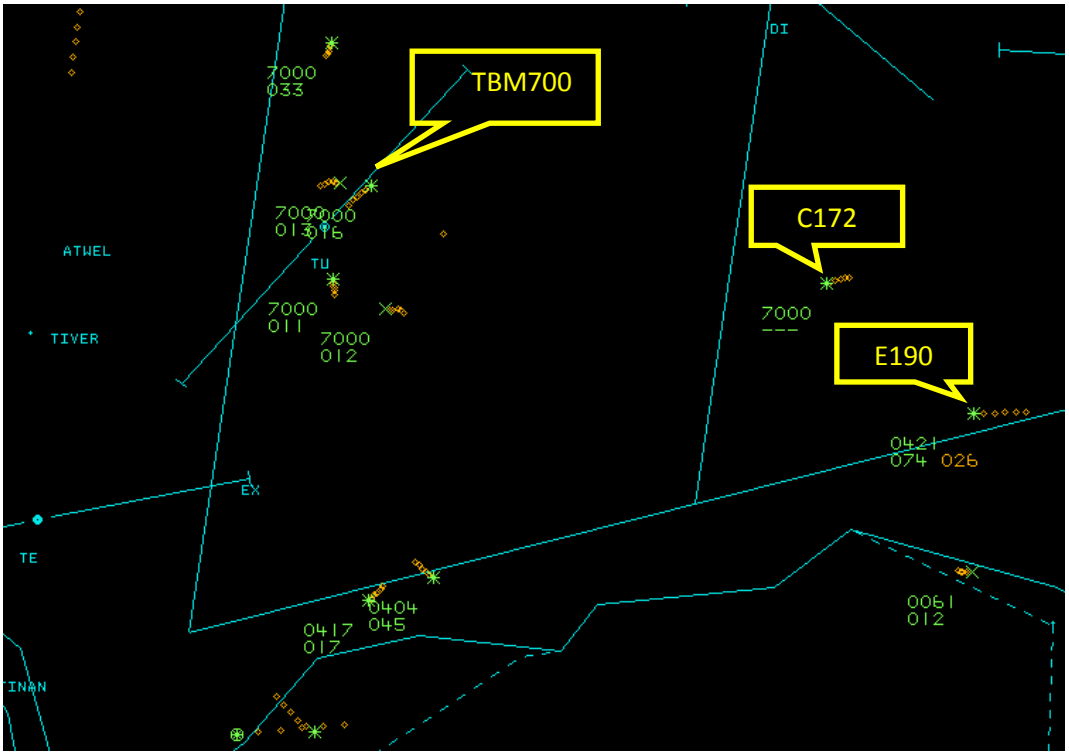


Figure 2 – Swanwick MRT at 1355:45.

The Exeter Radar controller then made an additional request of the C172 pilot to route inbound remaining to the north of the Honiton transmitter mast (Figure 3) and to expect a right-base join for RW26 at Exeter. The C172 pilot replied that he would route to the north of the town of Honiton.

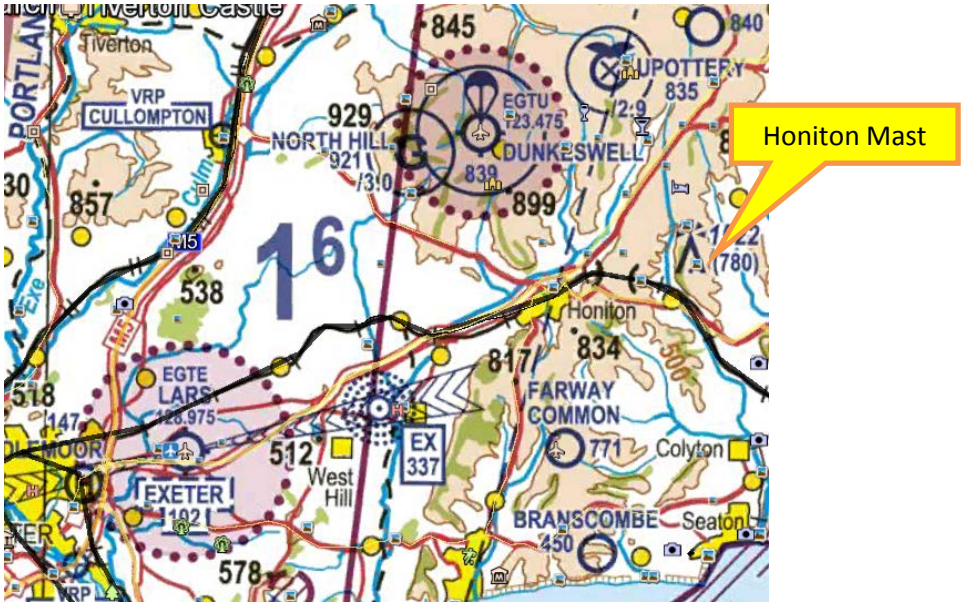


Figure 3 – Aeronautical Chart ICAO 1:500,000.

At 1356:37 (Figure 4), the TBM700 (code 7000) pilot contacted Exeter Radar and was instructed to standby. The Exeter Radar controller's next transmission was to stop the descent of the E190 at 3500ft against the C172.

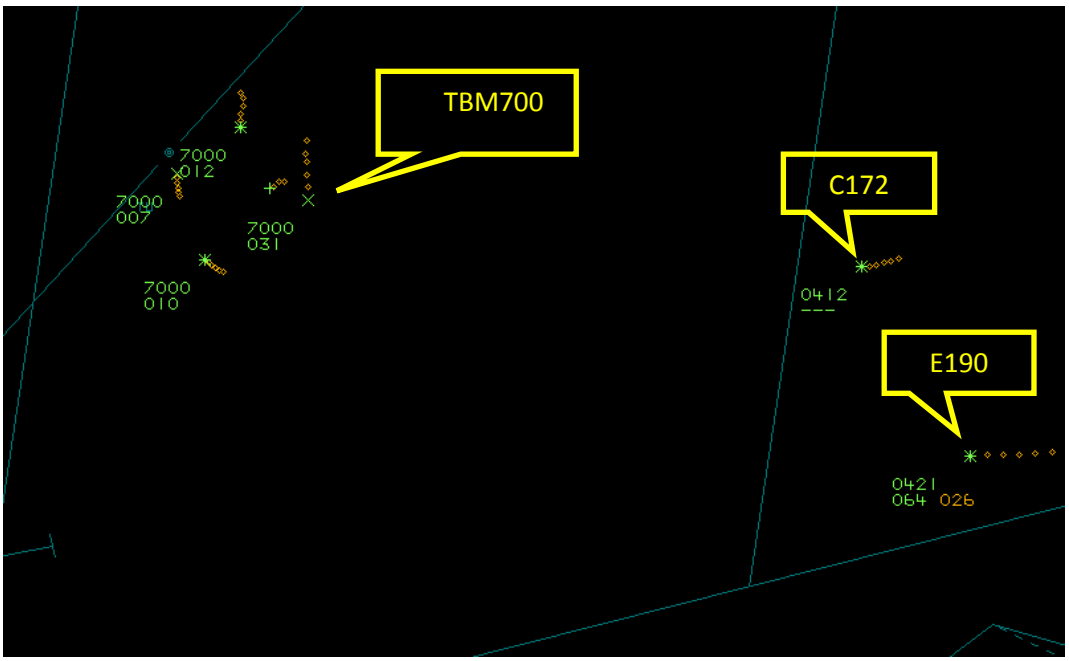


Figure 4 – Swanwick MRT at 1356:37.

At 1356:55 (Figure 5), the Exeter Radar controller instructed the TBM700 pilot to select the Exeter transponder code 0423. The controller then transmitted the following to the TBM700 pilot, *"…if you're approaching Honiton southbound can you make a left turn to hold (unintelligible) remain to the north of Honiton please".* The TBM700 pilot replied with *"…er that's er zero four two three and erm you say remain to the north of Honiton".*

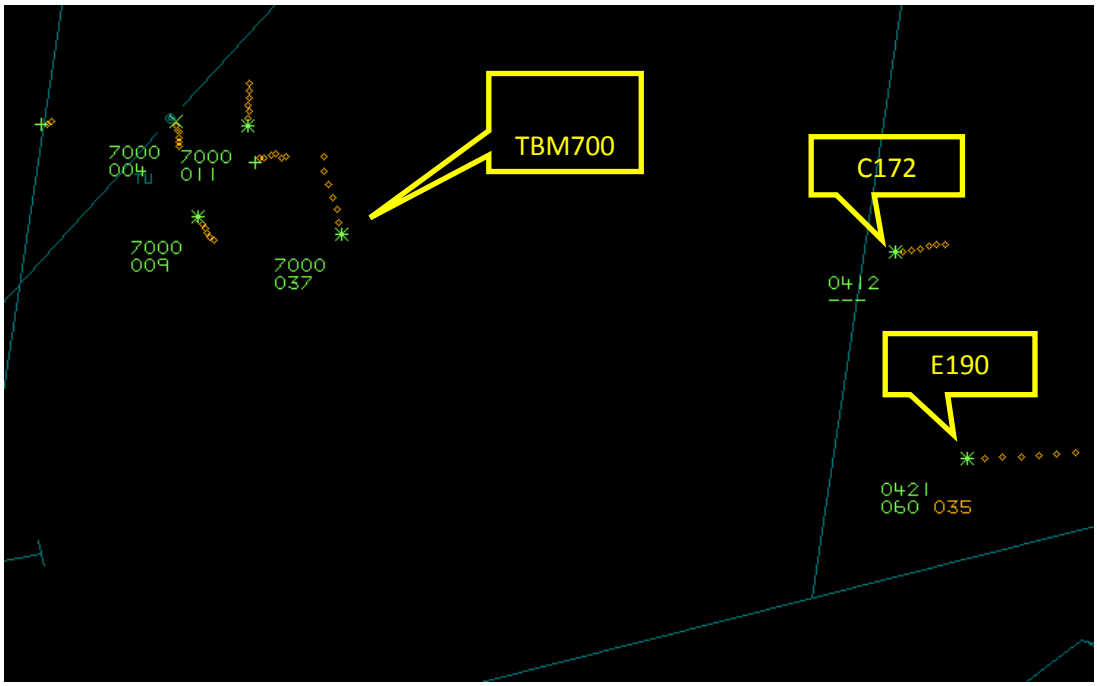


Figure 5 – Swanwick MRT at 1356:55.

At 1357:08 (Figure 6), the Exeter Radar controller transmitted the following to the TBM700 pilot, *"…er yes please if that's possible can you can you accept a left turn to remain north of Honiton you're converging with my ILS traffic on that er track".*

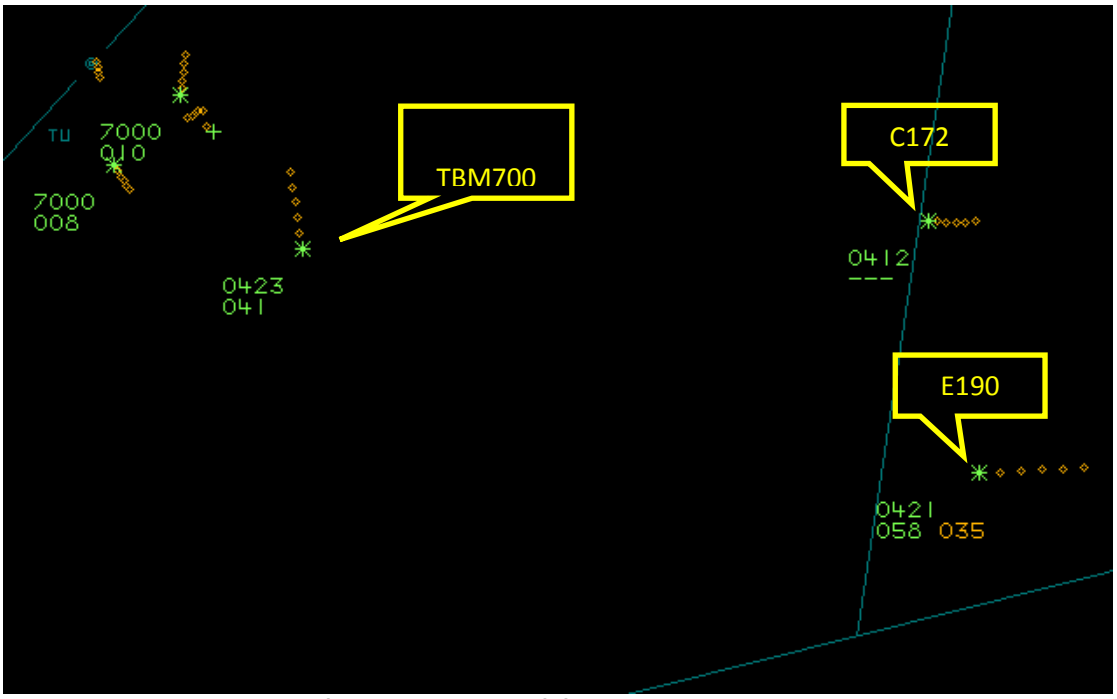


Figure 6 – Swanwick MRT at 1357:08.

At 1357:15 (Figure 7), the TBM700 pilot transmitted the following to Exeter Radar, *"…actually I don't think we're actually at Honiton we're south of Dunkeswell (unintelligible)".* In response to this the Exeter Radar controller replied, *"...no you are at Honiton now if you can accept a left turn please you're converging with traffic I've got".*

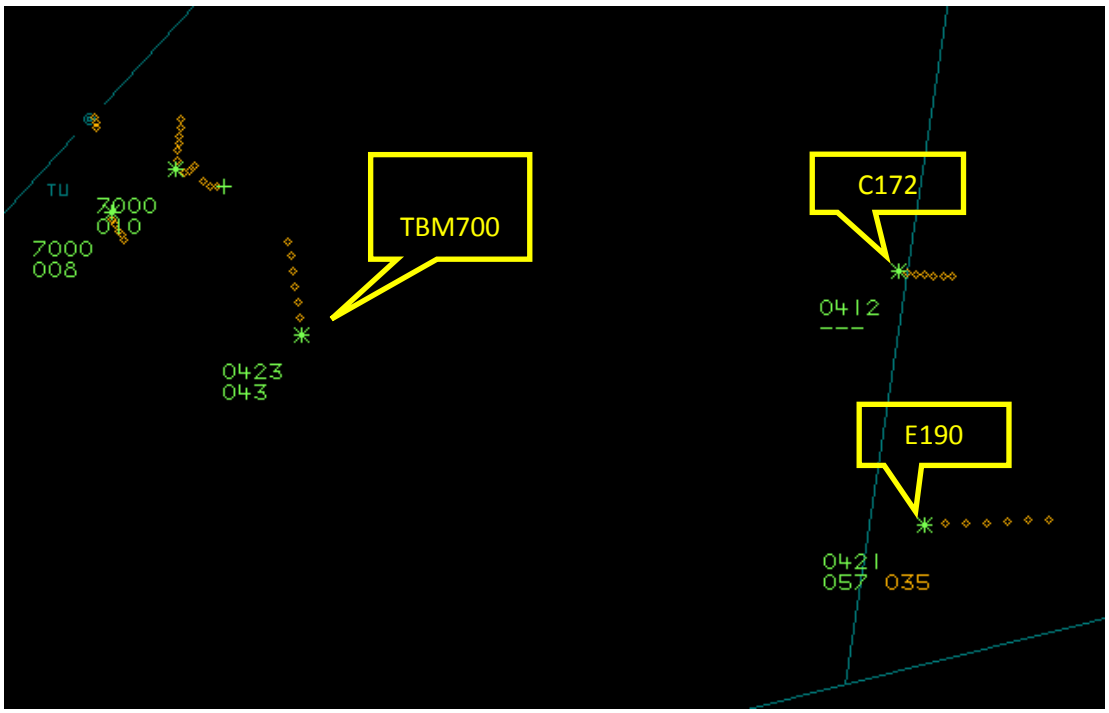


Figure 7 – Swanwick MRT at 1357:15.

At 1357:24 (Figure 8), the TBM700 pilot reported having commenced a left turn. The Exeter Radar controller then requested the TBM700's passing level. In response the TBM700 pilot reported that they were just levelling at altitude 5000ft.

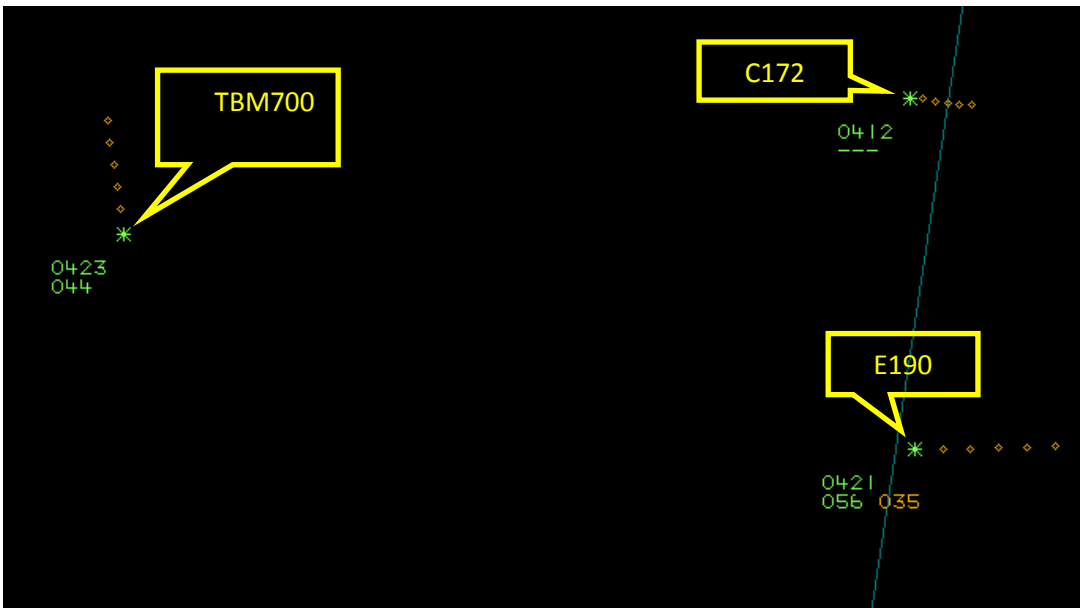


Figure 8 – Swanwick MRT at 1357:24.

At 1357:39, a Traffic Service was then agreed between the Exeter Radar controller and the TBM700 pilot.

At 1357:41 (Figure 9), the Exeter Radar controller passed Traffic Information to the E190 pilot *"…traffic is er one o'clock now range of five miles just starting a left turn turning away from you to the north indicating seven hundred be- beneath you this time".*

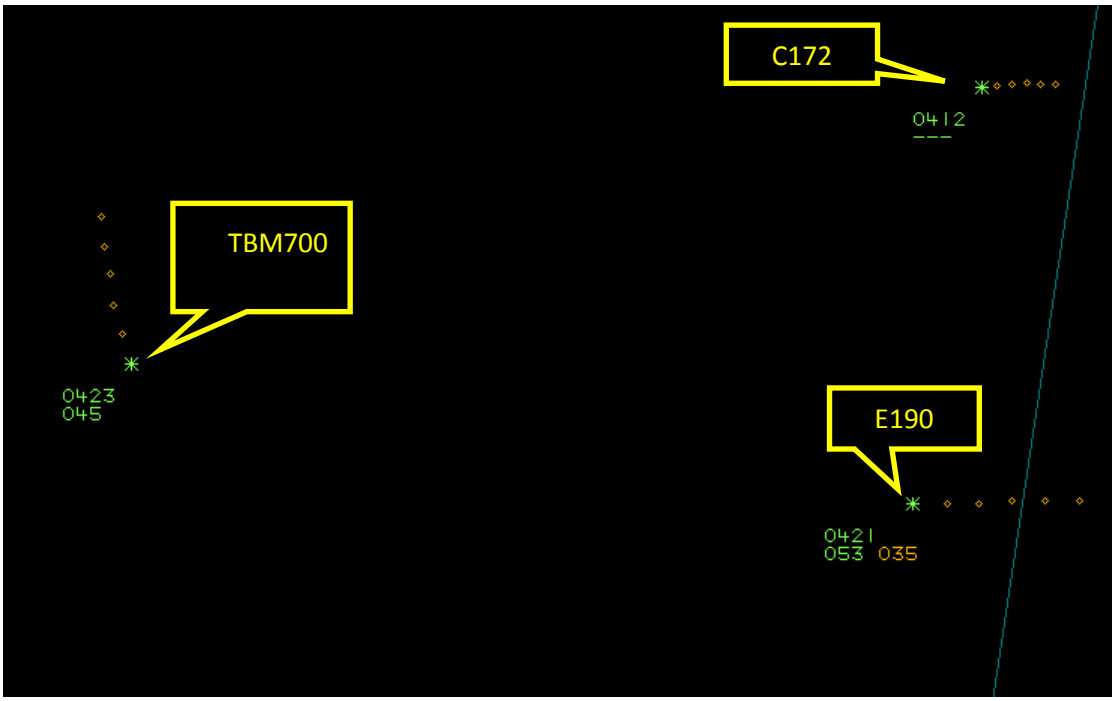


Figure 9 – Swanwick MRT at 1357:41.

At 1357:55 (Figure 10), the Exeter Radar controller stopped the E190 pilot's descent at FL050 and issued an avoiding action left turn heading 230°. There was also other known traffic working Exeter Radar at the time, a PA28 (code 0404) routeing eastbound indicating FL044 to the south-west of the E190. At this time the lateral and vertical distance between the TBM700 and the E190 was 4.1nm and 600ft.

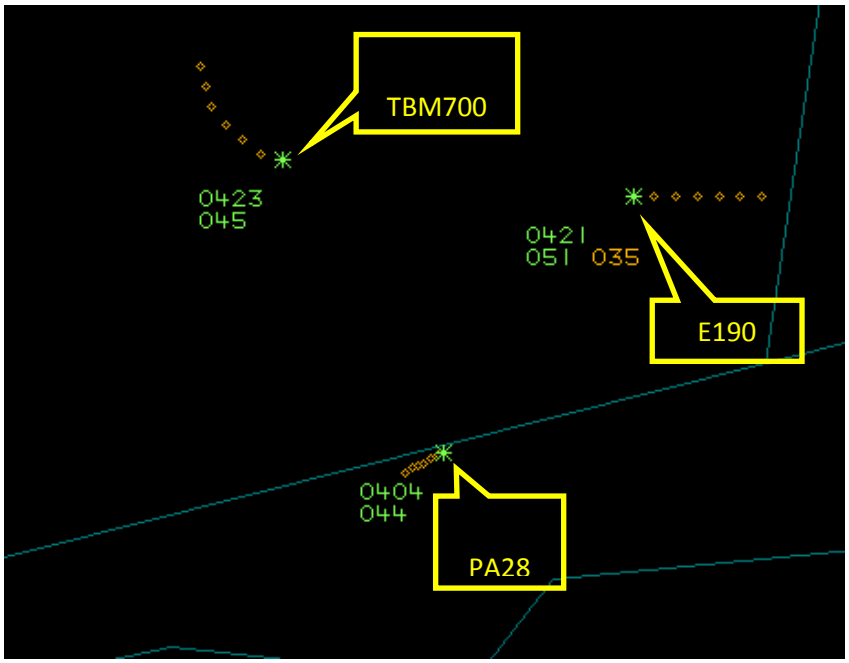


Figure 10 – Swanwick MRT at 1357:55.

At 1358:13, (Figure 11), the TBM700 pilot reported visual with the E190. At this time the lateral and vertical distance between the TBM700 and the E190 was 2.1nm and 400ft. Between this time and the CPA occurring, the E190 pilot reported a TCAS RA.

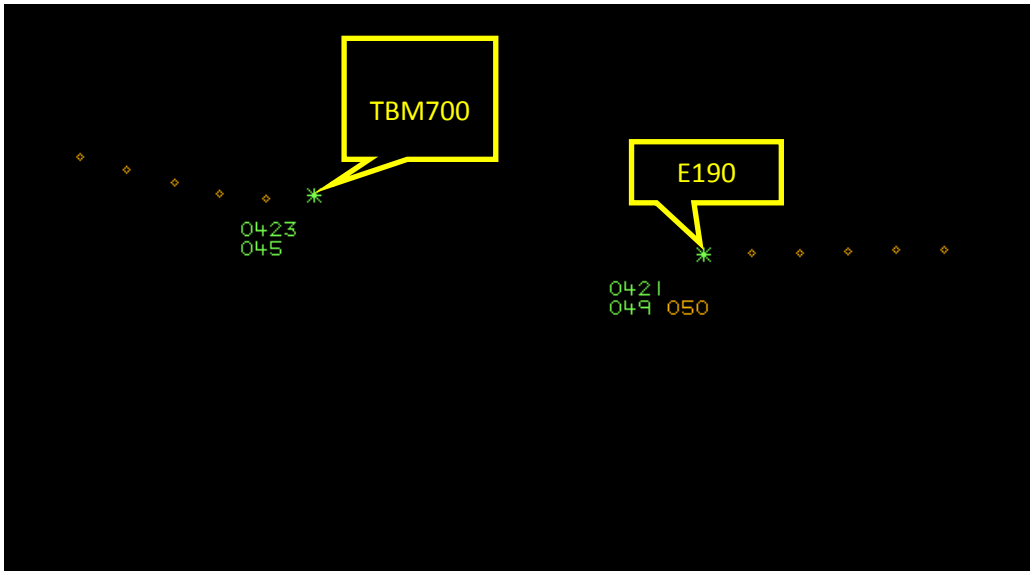


Figure 11 – Swanwick MRT at 1358:13.

CPA occurred at 1358:27 (Figure 12), at this time the recorded lateral and vertical distance between the TBM700 and the E190 was 0.7nm and 600ft.

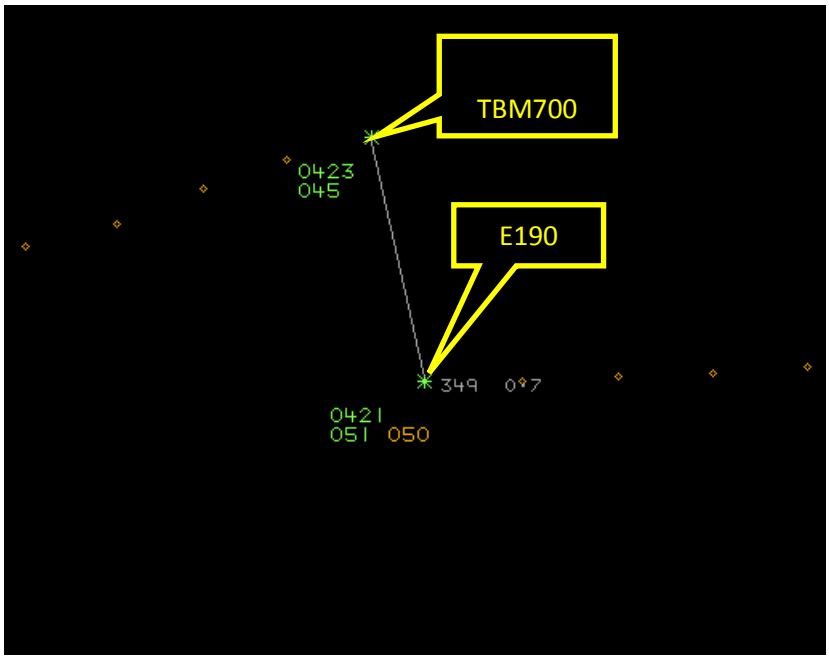


Figure 12 – Swanwick MRT at 1358:27 (CPA).

At the time of the Airprox, the Exeter Radar controller was providing an Approach Control Service in single-manned configuration. At interview, the controller described his workload as being light to moderate. Exeter ATC routinely split the approach function geographically, with separate Radar North and Radar South positions. However, on this occasion the controller stated that the traffic levels did not warrant the Radar South position being manned.

At interview the Exeter Radar controller described that in the period of time leading up to the Airprox, Dunkeswell aerodrome had been unusually busy with a significant number of unknown contacts operating between Exeter and Dunkeswell. It was for this reason that the Exeter Radar controller advised the E190 pilot, shortly after they came on frequency, that there was a possibility that he may need to be broken off. At the time, the controller was also engaged in providing a Deconfliction Service to another commercial aircraft (a DHC8) which was also inbound to Exeter.

The TBM700 pilot departed from RW04 at Dunkeswell and made a right-turn towards the south coast. Despite the TBM700 pilot filing a VFR flight-plan from Dunkeswell to Guernsey, Exeter Radar had no prior warning of the TBM700's departure. Dunkeswell aerodrome operate without Air Traffic Control and there is no requirement for the Dunkeswell Air-Ground Radio Operator to advise Exeter of a departure into the FIR. At interview the Exeter Radar controller described noticing the TBM700 depart, and that he initially expected the aircraft to be a lower performance type, more akin to the 'usual' Dunkeswell traffic. He went on to state that he was surprised by the speed and climb-rate of the TBM700.

The handling of the C172 which was routeing inbound to Exeter VFR from the east increased the Exeter Radar controller's workload coincident with the TBM700 leaving the Dunkeswell circuit. The Exeter Radar controller identified the C172 which was under a Basic Service and then entered into an agreement with the C172 pilot, ensuring that the C172 remained below 2500ft. He then stopped the descent of the E190 at 3500ft against that traffic. At interview the Exeter Radar controller stated that he was somewhat distracted by the C172 and felt that he might have noticed the TBM700's high speed and climb rate at an earlier stage had the C172 not been a factor. He also stated that the reason for initially instructing the TBM700 pilot to standby was because he was prioritising stopping the descent of the E190 against the C172.

Coincident with the Exeter Radar controller instructing the TBM700 pilot to squawk an Exeter code (0423), and before the TBM700 actually displayed that code, the controller became concerned about the relative positions of the TBM700 and the E190. Before a Traffic Service had been requested, the controller asked that the TBM700 make a left turn and remain to the north of Honiton. The TBM700 pilot read back the request followed by the Exeter Radar controller passing very generic Traffic Information on the E190. The TBM700 pilot then appeared to get confused regarding his position in relation to Honiton and questioned the controller's request. This then delayed the TBM700 pilot commencing the left-turn. Due to the controller prioritising routeing the TBM700 pilot away from the RW26 final approach, he omitted to inform the TBM700 pilot that he was identified once the Traffic Service had been formerly agreed.

At interview the Exeter Radar controller commented that he was expecting the TBM700 pilot to turn away to Honiton when requested; he went on to opine that had the request to do so been complied with there would have been *"no issue".* However, the delay in the TBM700 pilot commencing the turn, compounded by what he regarded as a greater than normal radius of turn, brought the TBM700 into conflict with the E190.

During interview various defensive controlling techniques were discussed. When questioned regarding whether he had considered breaking off the E190 pilot at an earlier stage. The Exeter Radar controller confirmed that he had considered this option but then discounted it because he was concerned about the possibility of then turning the E190 into conflict with other unknown, or for that matter, known traffic. The option of limiting the Deconfliction Service due to the unknown traffic was also discussed; however, the controller stated that he wished to provide the highest level of ATS to the E190 pilot that he was able to provide at the time.

The Exeter Radar controller's decision to give the TBM700 pilot a left turn was discussed at interview. With the benefit of hindsight the Exeter Radar controller agreed that a right turn towards the Exeter Airport overhead may have been more effective. However, once the TBM700 pilot was turning left, the controller felt committed to this course of action.

Very generic Traffic Information was passed to the TBM700 pilot on the E190 coincident with the Exeter Radar controller attempting to route the TBM700 pilot away from the RW26 final approach track. Specific Traffic Information was not passed; however, a Traffic Service was not formally agreed with the TBM700 pilot until after he had been requested to turn. Specific Traffic Information was passed to the E190 pilot on the TBM700 just prior to the Exeter Radar controller stopping the E190 pilot's descent and issuing the avoiding action turn.

The avoiding action phraseology used by the Exeter Radar controller was incomplete in respect of the E190, with the word 'immediately' omitted.

The TBM700 did not become known traffic[1] to the Exeter Radar controller until approximately 20 seconds before he issued the avoiding action turn to the E190 pilot. This situation is typical of the dynamic and unpredictable nature of providing Air Traffic Services within Class G airspace. Whilst the controller made all reasonable endeavours to achieve the deconfliction minima in respect of the E190, and took positive action regarding the TBM700 before any service had been requested or agreed, the geometry of the developing traffic situation was such that the minima eroded below that which is notified under the terms of a Deconfliction Service.

The Exeter Radar controller, whilst prioritising the descent of the E190 against the inbound C172, was slow to assimilate the high speed and climb rate of the TBM700 as it departed from the Dunkeswell circuit. The controller then became concerned regarding the proximity of the TBM700 relative to the E190 and requested that the TBM700 pilot turn away from the RW26 final approach track. The controller, whilst attempting to achieve the deconfliction minima in respect of the E190, entered into an agreement with the TBM700 pilot prior to the ATS being agreed. The TBM700

[1] *Traffic, the current flight details and intentions of which are known to the controller concerned through direct communication or co-ordination.* (CAP 493 – Glossary)

pilot's turn was somewhat delayed however, due to him questioning the controller's request, which contributed to the TBM700 then flying into conflict with the E190.

ATSI recommended that the textual information relating to Exeter International Airport, within the UK Integrated Aeronautical Information Package (IAIP), be reviewed. This review shall ascertain whether the current warning to pilots operating in Class G airspace, in accordance with IFR under a Deconfliction Service, is adequate.

UKAB Secretariat

The E190 and TBM700 pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard[2]. If the incident geometry is considered as head-on or nearly so then both pilots were required to turn to the right[3].

4.1 CAP 774[4] states:

'A Deconfliction Service is a surveillance based ATS where, in addition to the provisions of a Basic Service, the controller provides specific surveillance-derived traffic information and issues headings and/or levels aimed at achieving planned deconfliction minima, or for positioning and/ or sequencing. However, the avoidance of other traffic is ultimately the pilot's responsibility. A controller shall provide traffic information, accompanied with a heading and/or level aimed at achieving a planned deconfliction minima against all observed aircraft in Class G airspace.

The deconfliction minima against aircraft that are being provided with an ATS by the same controller, or that have been subject to co-ordination, are:

- *3 NM laterally (subject to surveillance capability and regulatory approval); or*
- *1,000 ft vertically; (2,000 ft within active MDA/MTA above FL410, and above FL290 where both aircraft are not RVSM approved); or In areas of high traffic density, a Deconfliction Service may still be provided, despite the controller considering it unlikely that deconfliction minima will be able to be achieved. In such circumstances controllers should provide an associated notification to the pilot of reduced traffic information and deconfliction advice should be given.'*

'A Traffic Service[5] is a surveillance based ATS, where in addition to the provisions of a Basic Service, the controller provides specific surveillance-derived traffic information to assist the pilot in avoiding other traffic. Controllers may provide headings and/or levels for the purposes of positioning and/or sequencing; however, the controller is not required to achieve deconfliction minima, and the pilot remains responsible for collision avoidance.'

Exeter International Airport is located within Class G (uncontrolled) airspace. Dunkeswell Aerodrome is approximately 10nm north-east of Exeter and is also located within Class G airspace.

Dunkeswell has a notice next to the booking-out log requesting that pilots intending to route south from Dunkeswell call Exeter Radar before reaching the town of Honiton, which is 4nm south-east of Dunkeswell, and approximately 2nm north of the RW26 final approach.

Summary

An Airprox was reported when an E190 and a TBM700 flew into proximity at 1358 on Sunday 13th November 2016. The E190 pilot was operating under IFR in VMC, in receipt of a Deconfliction Service from Exeter. The TBM700 was given Traffic Information by Exeter before the service was agreed with the pilot. Subsequently, a Traffic Service was agreed and provided.

[2] SERA.3205 Proximity.
[3] SERA.3210 Right-of-way (c)(1) Approaching head-on.
[4] Paragraph 4.1.
[5] Paragraph 3.1.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the E190 pilot, the controller concerned, area radar and RTF recordings and reports from the appropriate ATC and operating authorities.

The Board was disappointed that no report was received from the pilot of the TBM700 because this meant that they could not allow for his perception of what had occurred when coming to their conclusions. Notwithstanding, members felt that there was sufficient information available from the other reports with which to come to a conclusion.

The Board first noted that the E190 was inbound to the ILS RW26 at Exeter airport on an IFR flight, operating in VMC. Exeter is situated outside Controlled Airspace (CAS) and a Deconfliction Service was being provided to the pilot by Exeter Radar. Looking first at the actions of the Exeter controller, the Board was aware that whilst providing a Deconfliction Service, a controller should 'aim' to provide a planned deconfliction minima against all observed aircraft in Class G airspace. These deconfliction minima were 5nm laterally and 3000ft vertically against un-coordinated traffic, and 3nm laterally and 1000ft vertically when the aircraft are being provided with an ATS by the same controller (as in this case for the TBM700 and the E190).

Turning first to the actions of the controller, members noted that the controller had, appropriately, advised the E190 pilot that there was an amount of unknown traffic in the Dunkeswell area, which could result in him breaking off the approach. When the TBM700 pilot contacted Exeter Radar the controller he was in the process of stopping the E190's descent at 3500ft to provide separation from other traffic. The controller subsequently asked the TBM700 pilot to make a left turn to remain north of Honiton but the pilot appeared to be unaware of his position relative to Honiton and queried the request; this resulted in a 30sec delay to the TBM700 pilot enacting the request. The radar recording shows that at the time the two aircraft were 7.3nm apart, and the TBM700 was 1200ft below the E190. The Board deliberated whether the controller had taken the best course of action in the circumstances. ATC members opined that there had been options available to achieve the deconfliction minima but the airspace was clearly busy and the controller would have been acutely aware of the C172 to the north of the E190 and the PA28 to the southwest, both of which were constraining him. In asking the TBM700 pilot to turn left, he would have needed the pilot to have made the left turn as soon as he was requested if deconfliction minima were to be achieved at all. Given the TBM700 pilot's delayed response, the controller was now in a position where a reversal to the right was probably the only way that the minima would be achieved. Accepting that a reversal of turn might have been initially confusing to the TBM700 pilot, ATC Board members felt that the controller ought to have made this call rather than continuing with his left-turn plan which was clearly now not going to work. More fundamentally, the Board felt that if the controller had asked the TBM700 pilot to turn right in the first instance to route via the Exeter overhead then deconfliction minima would probably have been achieved, and some members opined that even if he had simply allowed the TBM700 pilot to maintain his southerly heading and expedite his climb then he would have crossed quickly through the RW26 approach probably well ahead of, and above, the E190.

In mitigation of his actions, it was apparent to the Board that the controller was surprised by the high performance of the TBM700 compared to the 'usual' aircraft that operate at Dunkeswell. However, it was pointed out that observation of the radar display would have shown its comparative high rate of climb and speed, albeit members accepted that the controller might have been distracted by the other aircraft on the screen at the time. The controller, subsequently, passed Traffic Information about the TBM700 to the E190 pilot, followed by instructing him to stop descent at FL50 and issuing an avoiding left turn heading 230°. At the time the two aircraft were 4.1nm apart laterally and 600ft vertically. Several Board members considered that, although realising that the controller was hoping that he would not have to break-off the E190 pilot's approach, avoiding action should have been given earlier if it had been his intention of achieving the deconfliction minima. Several Board members also wondered whether the controller should have taken the option of providing a limited Deconfliction Service if he did not think he would be able to achieve the deconfliction minima; however, Airline Pilot members opined that the E190 pilot would not necessarily have been content with this reduction in service.

The Board then turned its attention to the TBM700 pilot's actions. GA members opined that it would have been appropriate, bearing in mind the relative high performance of his aircraft and his intended southerly track, for him to have telephoned Exeter ATC prior to departure to advise them of his intended routeing. However, not having received a report from the pilot it was not known if he had considered that option. It was noted that there was a notice next to the Dunkeswell booking-out log requesting pilots that who intended to route south contact Exeter before reaching Honiton. Some members pointed out that the pilot had indeed called Exeter in accordance with this request but had been advised to standby. The Board then discussed what his actions should have been when not then able to communicate his intentions to ATC. It was apparent that he was heading south towards Exeter and some members believed that good airmanship dictated that he should have turned away from what could reasonably be anticipated as being busy airspace with possible IFR arrivals at Exeter Airport. However, other members opined that by routeing at 5000ft he would have been well above the glide slope feathers for the ILS, and that there had therefore been no obligation for him to adjust his track at all. In the event, unsure of his position relative to Honiton, the left turn requested by the controller was delayed in application, and the Board considered that, being a fundamental part of the controller's plan, this late turn by the TBM700 pilot was a contributory factor.

The Board then looked at the safety barriers that were relevant to this Airprox and decided that the following were key contributory factors:

- **ATS Conflict Detection and Resolution** was considered to have been only **partially effective** because Exeter ATC had not effectively controlled the E190 to ensure that the 3nm/1000ft deconfliction minima were achieved whilst providing a Deconfliction Service.

- **Flight Crew Pre-Flight Planning** was also determined to have been only **partially effective** because the TBM700 pilot had apparently not fully considered the implications of his routing through the Exeter approach path without establishing an ATS service with Exeter Radar.

- **Flight Crew Compliance with ATC Instructions** was similarly considered to have been only **partially effective** because the TBM700 pilot delayed actioning the turn requested by ATC.

- **Flight Crew Situational Awareness** was considered to have been only **partially effective** because ATC had only given generic Traffic Information about the E190 to the TBM700 pilot.

- **Onboard Warning/Collision Avoidance Equipment** was judged to have been **partially effective** because the E190 pilot did not receive a TA and only received a late RA. It was not known whether the TBM700 pilot had received any ACAS alerts.

The Board then turned its attention to the cause of the Airprox. Some Board members wondered whether the Airprox had occurred because the controller's action in requesting the TBM700 pilot to turn left had resulted in him turning the aircraft towards the E190. However, it was decided that this was only a contributory factor because despite any actions by ATC, both pilots were operating in Class G airspace and, under their responsibilities in that airspace, they were ultimately required to see and avoid each other. In regard to these responsibilities, the TBM700 pilot had only generic information about the E190 but had called that he was visual with it just prior to their passing each other. The E190 pilot was given specific Traffic Information on the TBM700, but only at a late stage once it had become 'known traffic' to the controller (about 20secs before CPA). The Board were perplexed as to why the TBM700 had not registered earlier on the E190's TCAS display, but noted that the E190 pilot reacted appropriately to the TCAS RA once it occurred. Noting that both pilots had had limited situational awareness as to the impending conflict, the Board decided that the cause of the incident was probably best described as a conflict in Class G airspace. Turning to the risk, it was quickly and unanimously agreed that, although the deconfliction minima had not been achieved, there had been no risk of a collision. The TBM700 pilot had reported visual with the E190, and the E190 had received a TCAS RA, albeit late, concerning the TBM700, before gaining visual contact with the aircraft. At CPA, the two aircraft passed each other on then deconflicting paths 0.7nm apart laterally and 600ft vertically. Accordingly, the Airprox was assessed as risk Category C.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A conflict in Class G airspace.

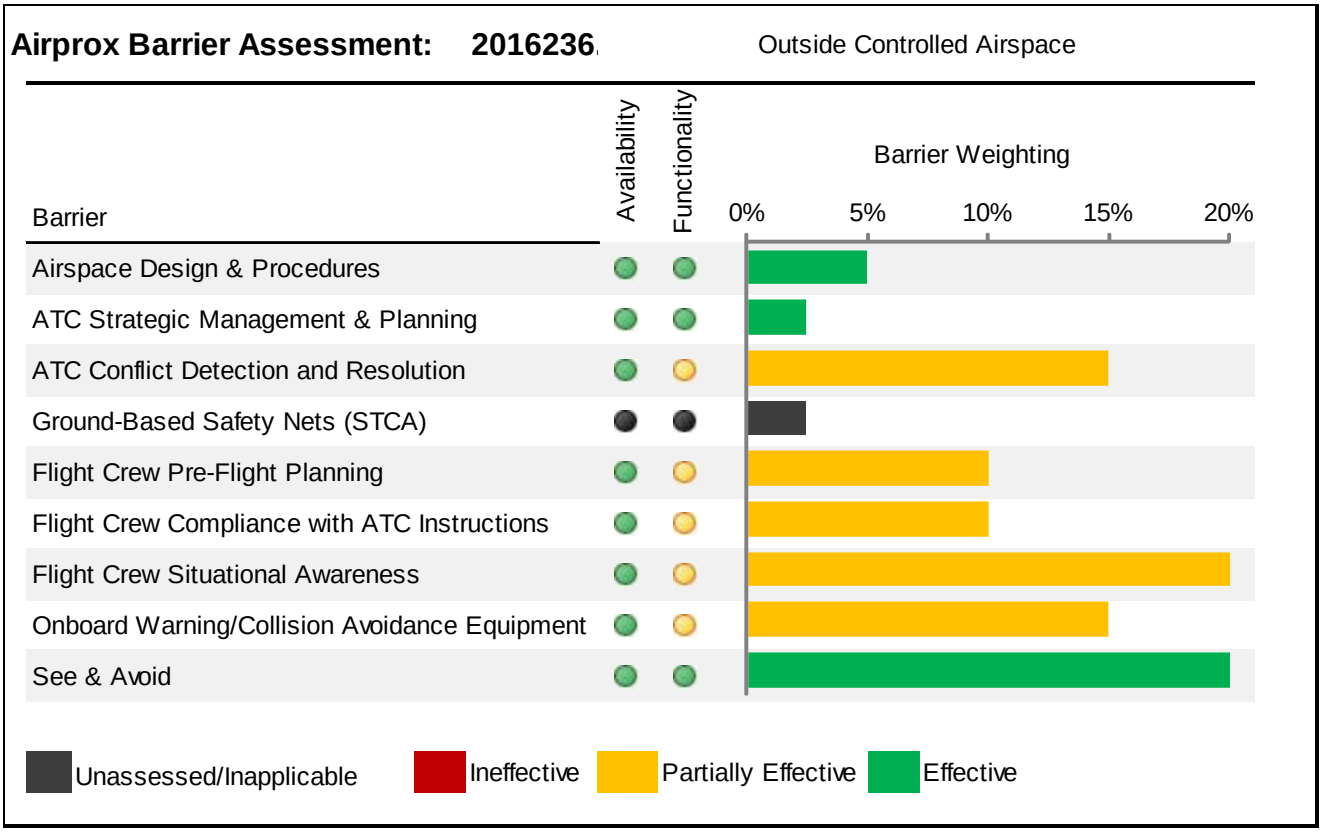
Contributory Factor: 1. A late turn by the TBM700 pilot.

2. The controller's requested turn resulted in the TBM700 pilot turning towards the E190.

Degree of Risk: C.

Barrier Assessment[6]:

Modern safety management processes employ the concept of safety barriers that prevent contributory factors or human errors from developing into accidents. Based on work by EASA, CAA, MAA and UKAB, the following table depicts the barriers associated with preventing mid-air-collisions. The length of each bar represents the barrier's weighting or importance (out of a total of 100%) for the type of airspace in which the Airprox occurred (i.e. Controlled Airspace or Uncontrolled Airspace).[7] The colour of each bar represents the Board's assessment of the effectiveness of the associated barrier in this incident (either Fully Effective, Partially Effective, Ineffective, or Unassessed/Inapplicable). The chart thus illustrates which barriers were effective and how important they were in contributing to collision avoidance in this incident.



[6] The UK Airprox Board scheme for assessing the Availability, Functionality and Effectiveness of safety barriers can be found on the UKAB Website

[7] Barrier weighting is subjective and is based on the judgement of a subject matter expert panel of aviators and air traffic controllers who conducted a workshop for the UKAB and CAA on barrier weighting in each designation of airspace.