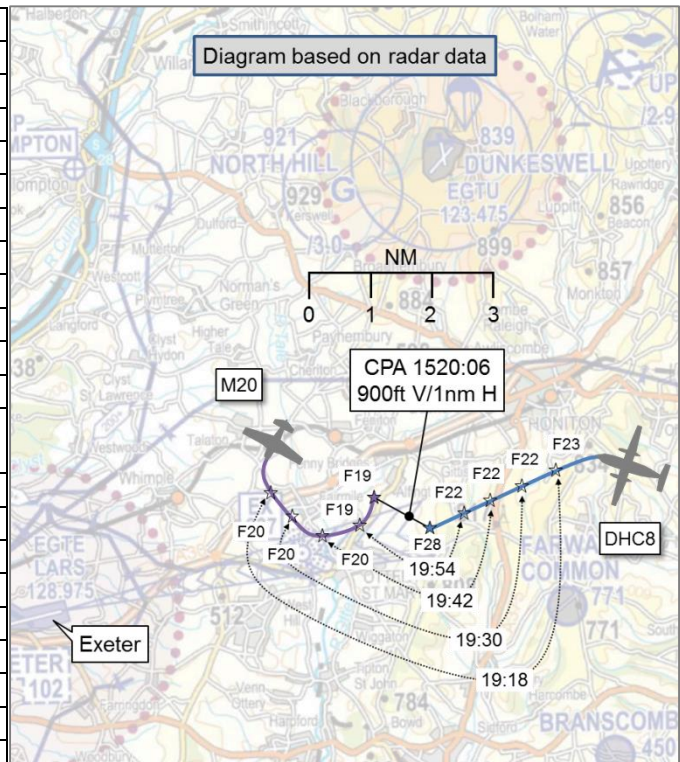


AIRPROX REPORT No 2016147

Date: 15 Jul 2016 Time: 1520Z Position: 5046N 00315W Location: 6nm E Exeter airport

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

| Recorded | Aircraft 1 | Aircraft 2 |
|-------------------|---------------------------|----------------------|
| Aircraft | DHC8 | M20 |
| Operator | CAT | Civ Pte |
| Airspace | London FIR | London FIR |
| Class | G | G |
| Rules | IFR | VFR |
| Service | Deconfliction | None |
| Provider | Exeter | |
| Altitude/FL | FL28 | FL19 |
| Transponder | A,C,S | A,C,S |
| Reported | | |
| Colours | Company | Blue/white |
| Lighting | Landing, position, flare | Strobes, recognition |
| Conditions | IMC | IMC |
| Visibility | | |
| Altitude/FL | 2600ft | 2000ft |
| Altimeter | QNH | QNH |
| Heading | 180° | 200° |
| Speed | NK | 140kt |
| ACAS/TAS | TCAS I | Not fitted |
| Alert | TA | N/A |
| Separation | | |
| Reported | 300ft V/ 1¼nm H (TCAS) | Not seen |
| Recorded | 900ft V/1nm H | |



THE DHC8 PILOT reports that after being vectored away from the localiser to avoid traffic they were descended from FL40 to 2600ft and told to close the localiser from the left. Flap 5 was selected, approach armed and approach checks completed. ATC was busy talking to the previous traffic when pop-up traffic (proximity only) appeared crossing the localiser from north to south ahead with no height information. They were under IMC and tried to gain VMC to resolve the traffic situation visually but, as they approached 2600ft, still IMC, they were told to 'go-around', climb to 3000ft and turn right. As this was being relayed, they received a TCAS TA that showed the conflict traffic at only 300ft below them despite them commencing a climb to 3000ft. With the TA still yellow and the vertical distance stubbornly remaining at 300ft as they reached 3000ft, he elected to continue the climb and ATC was informed of the further climb to 3500ft. The controller acknowledged this and said something like "I'm not sure what heading to turn you onto". Another voice, presumably the Supervisor, said "turn left to 180". They turned, continued the climb, and the TA cleared. The pilot of the conflicting traffic then came up on frequency. The DHC8 pilot added that it is not unusual to be vectored away from the localiser while positioning for the ILS to RW26 at Exeter due to unknown traffic on or near the centreline that is not communicating with Exeter Radar. Usually this is resolved quickly but, on this occasion with two aircraft causing conflict, radio calls being relayed, them being IMC, the conflict aircraft being at a higher than usual altitude, and TCAS not giving an RA, he considered that the threat increased exponentially. He could not understand why they had not received an RA and only a TA and why the height on the 'prox' aircraft only appeared at such late notice.

He assessed the risk of collision as 'High'.

THE MOONEY M20 PILOT reports that he was just airborne from Dunkeswell en route to the Channel Islands. He had made this trip many times and, whilst Dunkeswell could no longer activate his flight plan, in the past Exeter would activate it. Recently Exeter have asked him to contact London Information to activate his plan, which he did on this occasion. Unfortunately they were busy and it took longer than anticipated for him to speak to them. By that time he was at 2000ft, approaching the EX beacon. He turned away towards the east, initially making a 180° turn to fly west. By this time he was talking to Exeter Radar who told him to fly to a position north of the airport and then fly north to south in the climb to 6000ft. Subsequently, he now contacts Exeter Radar first once airborne and then changes to London Information to activate his flight plan.

THE EXETER RADAR CONTROLLER reports that he was on duty as an On the Job Training Instructor (OJTI) for a student controller providing the Exeter Radar service. The DHC8 pilot had been vectored onto the RW26 ILS at 11nm final. This followed a previous attempt at an ILS which was abandoned due to conflicting unknown traffic. As the DHC8 pilot established on the localiser, he was advised of further unknown traffic believed airborne from Dunkeswell heading south, together with a warning that the approach may have to be broken off again. The DHC8 pilot acknowledged this, implying he expected to be under the cloud soon and become visual. At the same time, the unknown aircraft changed from A7000 to A1177 squawk. He immediately telephoned London FIR and asked them to relay a request to the pilot to hold north of the RW26 centreline due to a DHC8 on the ILS and also to call Exeter Radar. A few seconds later this aircraft turned left to the east, on the centreline and towards the approaching DHC8 (3.5nm away). He immediately instructed the DHC8 pilot to go around and climb initially to 3000ft (subsequently the pilot reported climbing to 3500ft), passing further Traffic Information as he did so. The M20 pilot then called and was duly identified and requested to turn west and transit overhead the airfield north to south to avoid the ILS approach. In due course the DHC8 pilot advised that no TCAS RA had been received, but he would need to file a "Flap Overspeed report".

Factual Background

The weather at Exeter was recorded as follows:

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EGTE 151450Z 29009KT 250V330 9999 BKN027 20/14 Q1027=
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Analysis and Investigation

CAA ATSI

ATSI had access to reports from the controller involved, the pilots of both the DHC8 and the M20, the area radar recording, the Exeter Radar R/T and the unit investigation report. The DHC8 was being provided with a service by a trainee Radar controller; however, it was the OJTI who assumed control prior to the Airprox. An interview was conducted with both controllers. Screenshots produced in the report are provided using the area radar recordings. Levels indicated are Flight Levels (FL). All times UTC.

The DHC8 pilot was on an IFR flight inbound to Exeter, receiving a Deconfliction Service from Exeter Radar. The M20 pilot was on a VFR flight, initially receiving a Basic Service from London Flight Information.

Between 1514:10 and 1516:20, the DHC8 pilot (who was inbound from the east), had already completed a 360° turn to the left to avoid, and subsequently position behind, an EC130 helicopter flying down the extended final approach for RW26 (Figure 1).

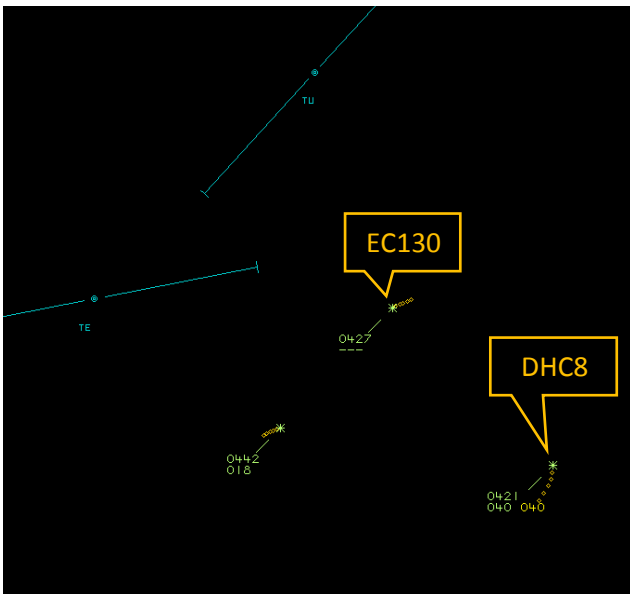


Figure 1 - Swanwick MRT – 1516:20 (DHC8 0421).

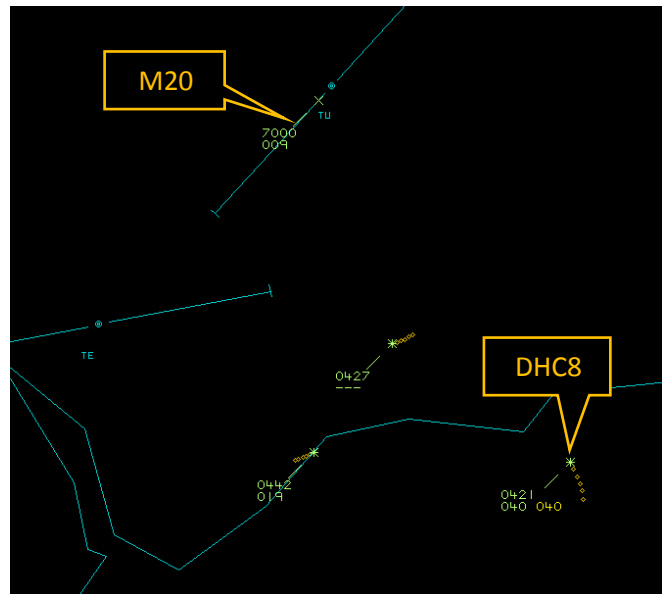


Figure 2 - Swanwick MRT – 1516:40.

The M20 became visible on the area radar recording at 1516:40 having departed RW22 at Dunkeswell (EGTU) (Figure 2).

At 1518:05, the DHC8 pilot was given a left turn onto a radar heading of 290° to intercept the RW26 ILS localiser (Figure 3).

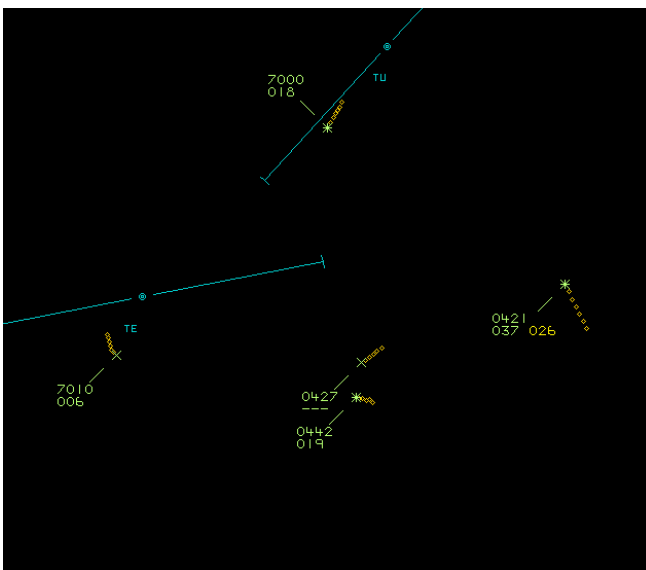


Figure 3 - Swanwick MRT – 1518:05.

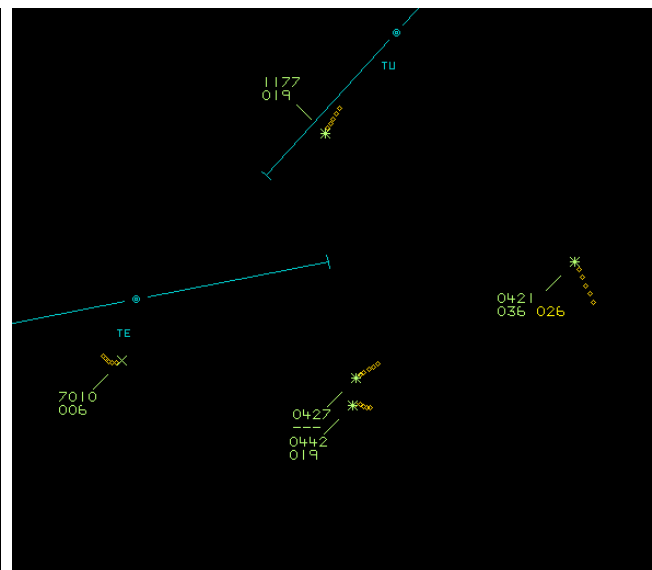


Figure 4 - Swanwick MRT – 1518:17 (M20 1177).

At 1518:11, the transponder code of the M20 was observed to change to 1177 (London Flight Information) and at 1518:17 the radar controller passed Traffic Information on the M20 to the DHC8 pilot stating *“additional traffic is just north of the EX (NDB) tracking southbound, so I may have to break you off again as well”* (Figure 4). The pilot of the DHC8 acknowledged this and at 1518:25 advised that they *“might try and get ourselves down beneath cloud, er, so we are visual”*.

At 1518:30, the OJTI initiated a telephone call to London Flight Information which connected at 1518:50. The OJTI asked them if they had an aircraft climbing out of Dunkeswell, which was confirmed by the FISO, and they requested that the aircraft be asked to hold north of the (Runway) 26 final approach as it was just about to conflict with traffic on the ILS. The FISO said they would transfer the pilot across straight away but the Exeter OJTI repeated the request to

have the pilot stay north of the centreline before transfer, to which the FISO agreed. The phone call ended at 1519:10.

At 1519:20, the controller passed further Traffic Information to the DHC8 pilot on the M20, advising that the M20 was “crossing the EX indicating 2400ft, climbing” which was acknowledged by the pilot of the DHC8 (Figure 5).

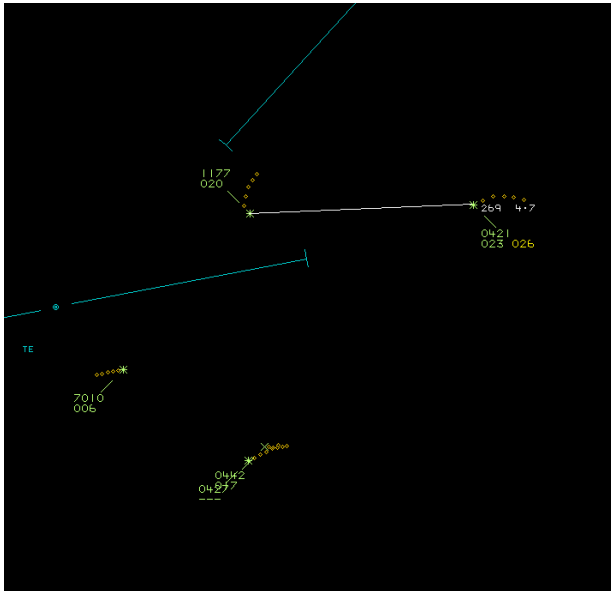


Figure 5 - Swanwick MRT – 1519:20.

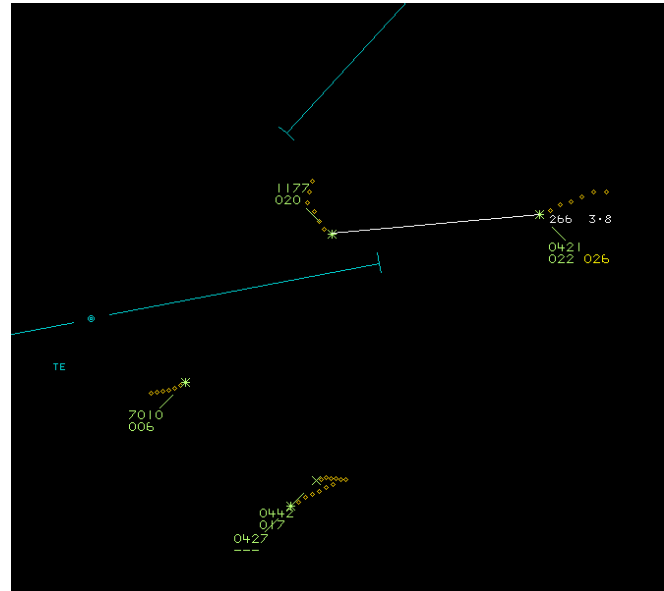


Figure 6 - Swanwick MRT – 1519:30.

1519:30, the OJTI took the frequency and asked the DHC8 pilot if he had acquired ground contact, but received no reply (Figure 6).

At 1519:38, the OJTI advised the DHC8 pilot that “this thing’s turning towards you now, er, go-around I say go-around, make a right turn heading er, 310 degrees, climb er to 3000ft” (Figure 7).

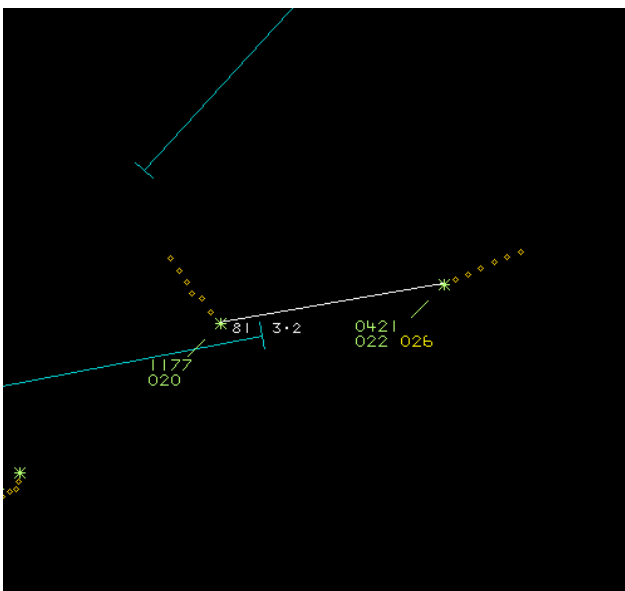


Figure 7 - Swanwick MRT – 1519:38.

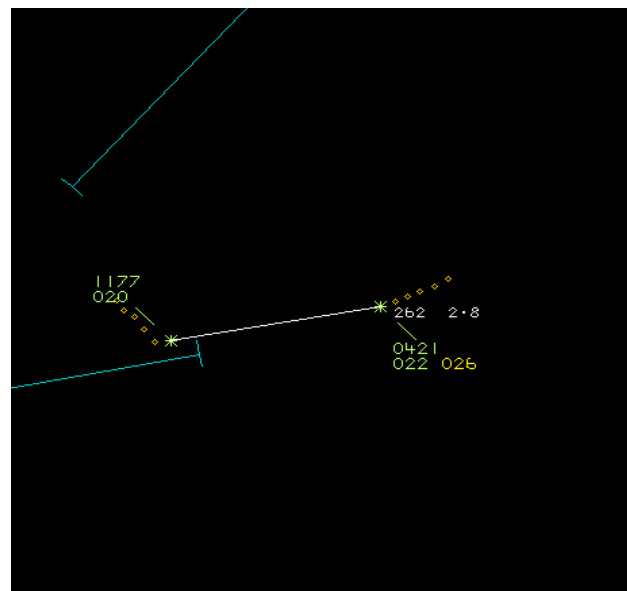


Figure 8 - Swanwick MRT – 1519:45.

The DHC8 pilot acknowledged the climb but asked the controller to repeat the heading, to which the controller, at 1519:45 (Figure 8), replied “okay, he’s er 12 O’Clock now range of 2 miles not talking to me, don’t know what it is, indicates er 2400ft and er, I’m not sure which way to go now, (Figure 9) er, probably left left if you can accept that now, on to 180 degrees”. (Figure 10).

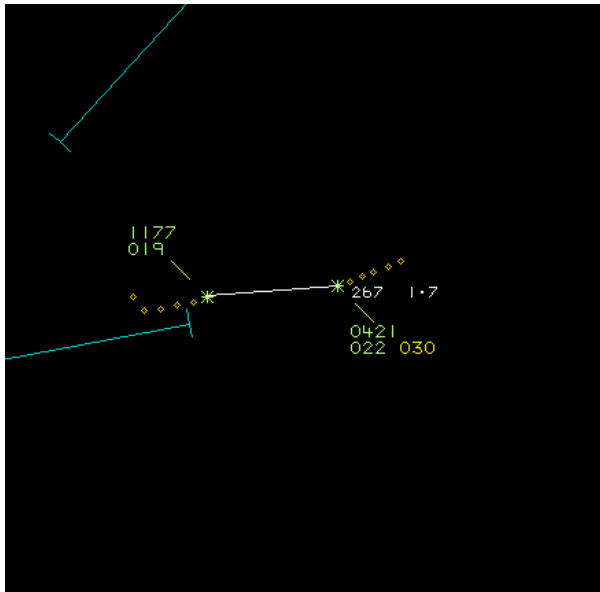


Figure 9 - Swanwick MRT – 1519:55.

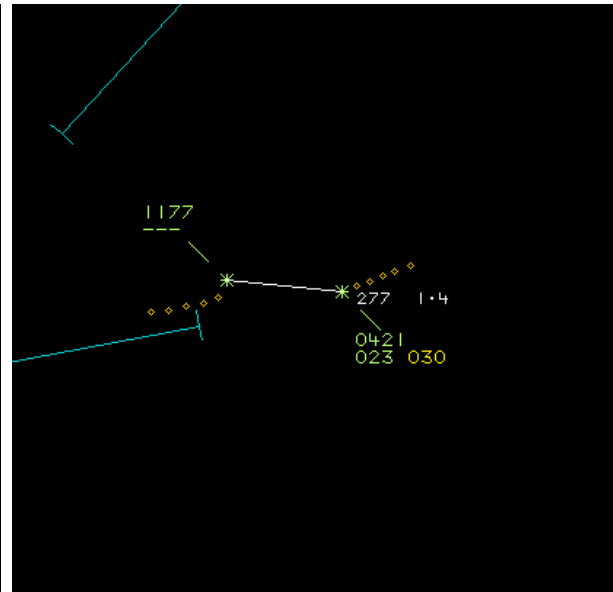


Figure 10 - Swanwick MRT – 1520:00.

The CPA took place at 1520:06 with a lateral distance of 1nm and vertical of 900ft (Figure 11). The pilot of the DHC8 then advised that they were climbing to 3500ft.

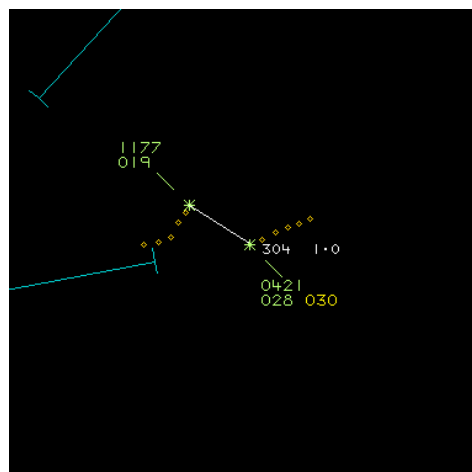


Figure 11 - Swanwick MRT – 1520:06.

The above scenario (without the Airprox), is what would be considered by Exeter controllers to be fairly common, with the requirement to take IFR aircraft away from the airfield and final approach (and issue turns of 360°), as a result of other unknown aircraft in the vicinity. On occasions, it is not unusual for such aircraft to make more than one approach before reaching a point from which a landing can be made.

The trainee Radar controller had over 100 hours experience, which was approximately midway through the standard unit training plan. The OJTI had many years of experience as both a controller and an OJTI at Exeter. However, the trainee had only a little experience of this type of scenario with the requirement for multiple heading changes for inbound IFR aircraft. The Traffic Information that the trainee passed, which was both timely and accurate, was unprompted by the OJTI. There had been a conversation between the trainee and the OJTI about the Dunkeswell departure, just before the trainee passed the first Traffic Information on it to the DHC8 pilot.

Traffic departing Dunkeswell are given some leeway by Exeter controllers, to allow time for the pilot to climb out on the Dunkeswell RW22 track to gain height, before turning away from the Exeter RW 26 final approach. ATSI were advised by Dunkeswell that a notice next to the

booking-out log requests 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. On this occasion the pilot of the M20 elected instead to contact London Flight Information [Exeter had recently requested him to contact London Flight Information to activate his flight plan]. (Dunkeswell is an Air-Ground unit, and the pilots cannot be instructed to call any specific ATC unit when leaving the Dunkeswell frequency).

It was the OJTI's decision to contact London Flight Information in an attempt to have them keep the M20 away from final approach. The OJTI had hoped that the DHC8 pilot would get below cloud (as intimated by the pilot) and acquire visual contact with the M20, therefore maintaining their own separation and enabling them to continue on the final approach track to land at Exeter. Because the DHC8 pilot had not confirmed that they were visual with the ground when questioned by the OJTI, the OJTI took the decision to take further action at that time, rather than explain to or instruct the trainee to do so.

The OJTI instructed the pilot of the DHC8 to carry out a "go-around". At interview the OJTI admitted that this was the wrong phraseology and that it should have been an instruction on avoiding action. The advisory turn right onto a heading of 310° was based on the observed track of the M20 and the assumption that it would continue that track through the Exeter final approach. This was considered to be appropriate at the time. The climb instruction to 3000ft would have been insufficient to regain the vertical deconfliction minima of 3000ft, and in fact the DHC8 pilot made the decision, based on receiving a TCAS TA as well, to climb to 3500ft.

The report from the pilot of the M20 reported that they turned east as they approached the EX (NDB), with the ultimate intention of continuing that turn to track west. They stated that they contacted London Flight Information in order to activate their flight plan as they recently been advised that Exeter would not do so. It was not until the DHC8 pilot had been instructed to commence a go-around and turn that it became apparent that in fact the M20 pilot was turning away from the final approach.

Because the DHC8 pilot had missed the heading given and asked the controller to repeat it, the controller was given an opportunity to change the heading to a left turn onto 180°, which again was appropriate under the circumstances, although an opportunity to insert the avoiding action phraseology was again missed.

Neither pilot reported visually acquiring the other aircraft.

It was noted that the DHC8 pilot did not appear to take the controller's subsequent advisory heading of 180°.

The Manual of Air Traffic Services, CAP493 states:

*"In Class G airspace, separation between aircraft is ultimately the responsibility of the pilot; however, in providing a Deconfliction Service or a Procedural Service, controllers will provide information and advice aimed at achieving a defined deconfliction minima."*¹

The deconfliction minima against unco-ordinated traffic are:

*'5nm laterally (subject to surveillance capability and regulatory approval); or 3,000ft vertically and, unless the SSR code indicates that the Mode C data has been verified, the surveillance returns, however presented, should not merge.'*²

The deconfliction minima had been allowed to become eroded whilst apparently both DHC8 pilot and controller attempted to enable the pilot to gain a visual acquisition of the M20.

¹ Section 1: Chapter 3: Separation Standards

² CAP774 UK Flight Information Services, Chapter 4

The appropriate phraseology was not used by the OJTI in giving the DHC8 pilot advice on avoiding the M20, although the climb instruction and ultimately the M20 pilot's turn away from final approach ensured that separation did not erode further.

An entry in the AIP for Exeter under Warnings states: *'Aircraft in the Dunkeswell ATZ may operate less than 5nm north of the Final Approach Track to Runway 26. Deconfliction minima against this uncoordinated traffic cannot be guaranteed.'*³

UKAB Secretariat

The DHC8 and M20 pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard⁴. If the incident geometry is considered as head-on or nearly so then both pilots were required to turn to the right⁵.

CAP 493⁶ states:

'Controllers should note that simple transfers of communication form part of the London FISOs' standard operating procedures. However, FISOs are not permitted to issue any control instructions to aircraft. Controllers must not request FISOs to relay any instructions, other than for the aircraft to transfer directly to their control frequency so that the controller can resolve the situation.'

The M20 pilot did not contact Exeter until just after the CPA.

Summary

An Airprox was reported when a DHC8 and an M20 flew into proximity at 1520 on Friday 15th July 2016. The DHC8 pilot was operating under IFR in IMC, in receipt of a Deconfliction Service from Exeter. The M20 pilot was operating under VFR in VMC and was in the process of changing frequency from London Flight Information to Exeter. Neither pilot saw the other aircraft. The minimum separation was recorded as 900ft vertically and 1nm horizontally.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Looking first at the actions of the DHC8 pilot, the Board noted that he was inbound to Exeter, which is situated outside CAS, on an IFR flight in receipt of a Deconfliction Service. The pilot had been given heading instructions to avoid an unknown aircraft (later determined to be an EC130) and, when clear of the traffic, had then been vectored towards the ILS RW26. The Board were informed that such delays were common-place during approaches to Exeter and that, on having been warned that he might have to break off his approach again, the pilot had commented that he might get below cloud to be able to continue visually. However, before he could do so, the DHC8 pilot had been instructed to go around and had become concerned about the presence of the M20 on his TCAS display with little height difference as he climbed. Understandably apprehensive, the DHC8 pilot had continued his climb above the ATC-cleared level, and informed ATC that he had done so.

For his part, the M20 pilot reported that Exeter had recently stated that they would no longer activate his Flight Plan and that this was why he had contacted London Information immediately after take-off. A Civil ATC member commented that he could understand why Exeter might have changed their

³ AIP AD 2.20 AD 2.EGTE-11 Para 4 (e)

⁴ SERA.3205 Proximity.

⁵ SERA.3210 Right-of-way (c) (1) Approaching head-on.

⁶ Section 1, Chapter 6, Page 18, Paragraph 15A.3.

policy on activating flight plans because it was a time consuming operation and his unit had similarly stopped doing so for aircraft not getting airborne from their airfield. The Board noted that, as a result, the M20 pilot had departed from Dunkeswell routing via the EX NDB (which involved crossing Exeter's RW26 instrument approach path), in contact with the Flight Information Service. Although the Board could understand how this had come to pass, members thought it demonstrated less than ideal airmanship for him to plan to route through the approach path without first contacting Exeter to ascertain whether there was any conflicting traffic in the vicinity, and especially given that there was a notice next to the booking-out log requesting that pilots intending to route south contact Exeter before reaching Honiton. This was even more relevant because of the weather conditions at the time; the DHC8 was on the approach in cloud, resulting in see and avoid being ineffective and this was his only way of being aware of other traffic because the M20 was not equipped with any form of TAS. As a result, the Board considered that the M20 pilot not being in communication with Exeter ATC was a contributory factor to the Airprox. That being said, the Board was heartened to see his remarks that he had learnt from this incident and now contacts Exeter on getting airborne before the Flight Information Service.

The Board turned its attention to the ATC aspects of the Airprox. It was noted that there was an instructor and a student in place on the Approach Radar position, that initially the student was vectoring the DHC8 towards the ILS, and when the instructor noticed the squawk of the M20 change he telephoned the Flight Information Service to request that the FISO ask the M20 pilot to hold north of the RW26 final approach. Although seemingly a minor point (but see later), controller members noted that this call to the Flight Information Service was contrary to the instructions stated in CAP 493 that controllers must not request FISOs to relay any instructions (the FISO initially said he would transfer the pilot straight away but again the instructor asked him to request the pilot to hold before transfer and this time the FISO agreed). When this telephone call ended the student passed further Traffic Information to the DHC8 pilot about the M20 crossing the EX NDB (5nm east of the airport) at 2400ft climbing. The Board noted that the radar recording showed that the two aircraft were now 4.7nm apart and several Board members commented that when providing a Deconfliction Service a controller should aim to achieve the deconfliction minima, in this case 5nm laterally or 3000ft vertically. They wondered why the controller had not passed instructions to the DHC8 pilot at this point to try and achieve this minima, especially as it had already reduced below 5nm. The general opinion was that the controller, taking notice of the DHC8 pilot's hope to get below cloud, had unsatisfactorily let the situation continue without this hope being achieved. In fact, controller members noted that he did not take any action until the two aircraft were 3.2nm apart, when the M20 was observed turning towards the DHC8. The Instructor, who had now taken over the RT, instructed the DHC8 pilot at this point to go-around to make a right turn heading 310° and climb to 3000ft. The pilot queried the heading, which was then changed to left 180° (hesitantly) because the M20 pilot had continued his left turn to the north of the approach path (which was probably as a result of the FISO requesting the M20 pilot to remain north of the approach path). The radar recordings show that if instead the M20 pilot had continued on a southerly heading, he would have crossed through the approach path sufficiently ahead of the DHC8 to prevent the possibility of a collision. It was apparent to the Board that the controller was keen not to have to break-off the DHC8 pilot's approach again; however, unless the pilot had become visual, the only way of not having to take action was if the pilot had been happy to change from a Deconfliction to a Traffic Service. An Airline Pilot member stated that he was aware that the Ops Manual of the DHC8's company prevented a pilot from agreeing to this change; he would only be able to operate outside CAS in receipt of a Deconfliction Service.

In looking at the barriers that were relevant to this incident, the Board agreed that the following were contributory factors:

- **Airspace design and Procedures** were considered to have been only **partially effective** because members felt that the procedure for pilots departing Dunkeswell to call Exeter before passing Honiton was not sufficiently robust.
- **ATS Operational Threat Awareness and Management** was also considered to have been only **partially effective** because Exeter ATC had not effectively controlled the DHC8 to ensure that 5nm/3000ft had been achieved as required under a Deconfliction Service.

- **Flight Crew Pre-flight Management and Planning** was determined to have been only partially effective because the M20 pilot had not properly considered the implications of his routing through the Exeter approach path without talking to Exeter Radar versus activating his flight plan with London Flight Information Service.
- **Flight Crew Operational Threat Awareness and Management** was also considered to have been only **partially effective** because the M20 pilot continued to route across the Exeter approach path without talking to Exeter Radar.
- **Electronic Warning System and Resolution Action** was judged to have been **partially effective** because the M20 did not have an ACAS/TAS fitted and therefore had no associated warnings of the DHC8.
- **Flight Crew See & Avoid** was not available because the DHC8 was IMC and therefore the M20 pilot could not see it, and neither could the DHC8 see the M20.

The Board then turned its attention to the cause and risk of the Airprox. It was quickly agreed that the Airprox occurred because the Exeter controller, who was providing a Deconfliction Service and could see the M20 on his radar display, had nonetheless continued to vector the DHC8 into conflict with it. They then discussed the risk. Although avoiding action had been delayed, members acknowledged that the controller did break off the DHC8's approach and had instructed the pilot to climb to 3000ft; the pilot subsequently continued his climb to 3500ft. The Board noted that, at CPA the two aircraft were well separated, 900ft vertically and 1nm horizontally, and by this time they were also on diverging tracks. Accordingly, it was judged that although safety had been degraded, the action taken had removed the possibility of a collision and so the Airprox was assessed as risk Category C.

Since the Board meeting, the Exeter Air Traffic Services Manager has commented about the activation of Flight Plans for pilots departing from Dunkeswell. He confirmed that Exeter has never activated Flight Plans for aircraft departing an airfield other than Exeter and this has never really been an issue because Dunkeswell had Assisted Flight Planning Exchange (AFPEX) and they used to file the airborne times. NATS had started to charge for AFPEX earlier this year, so Dunkeswell decided that they would not use it anymore; however, they had not advised Exeter of this. He agreed that the Airprox had highlighted the shortcomings of Dunkeswell's lack of access to AFPEX on the internet, and was pleased to advise that they were just completing a procedure whereby, during their published opening hours, Dunkeswell have agreed to telephone the AFPEX Helpdesk to pass aircraft airborne times to activate Flight Plans. Outside of Dunkeswell's published opening hours, Exeter will telephone the AFPEX Helpdesk to activate the plan *on request* from the pilot. According to the UKAIP⁷ telephoning the AFPEX Helpdesk is preferable to an aircraft calling London Flight Information.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Exeter ATC vectored the DHC8 into conflict with the M20.

Contributory Factor: The M20 pilot was not in communication with Exeter ATC.

Degree of Risk: C.

Barrier Assessment:

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).^{8*} 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, Not Available, or Not

⁷ ENR 1.10-3, Paragraph 1.8.3.

⁸ 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.

Assessable). The chart thus illustrates which barriers were effective and how important they were in contributing to collision avoidance in this incident.

