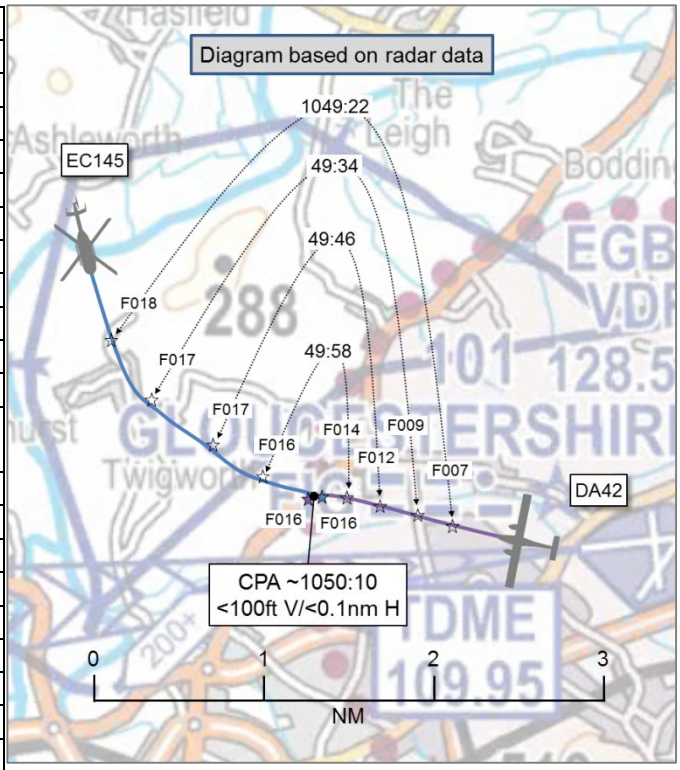
AIRPROX REPORT No 2016012

Date: 4 Feb 2016 Time: 1050Z Position: 5154N 00213W Location: Gloucestershire ATZ

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	EC145	DA42
Operator	HEMS	Civ Trg
Airspace	Gloster ATZ	Gloster ATZ
Class	G	G
Rules	VFR	IFR
Service	Aerodrome	Procedural
Provider	Gloster	Gloster
Altitude/FL	1600ft	1500ft
Transponder	A, C, S	A, C, S
Reported		
Colours	Yellow	Mainly white
Lighting	Strobes, anti-col, nav, landing, flood	Strobes, landing
Conditions	VMC	VMC
Visibility	>10km	>20km
Altitude/FL	2000ft	2400ft
Altimeter	QFE (1022hPa)	QNH (1025hPa)
Heading	090°	285°
Speed	90kt	100kt
ACAS/TAS	TCAS I	Not fitted
Alert	TA	N/A
Separation		
Reported	0ft V/100-150m H	Not seen
Recorded	<100ft V/<0.1nm H	



THE EUROCOPTER EC145 PILOT reports that he was approaching Gloucestershire airport at 2000ft, off-set to the west, in order to turn onto and run in along a downwind heading for RW27. Spacing from the runway was consistent with the distance needed to successfully perform a 180° 'autorotation' from a downwind heading. Gloster TWR gave permission to set up for the autorotation and informed them of an aircraft joining at 3000ft, which they acknowledged. He did not remember any other Traffic Information being passed. When the TCAS gave its initial alert, it was indicating in the forward section and below, which seemed strange as they expected traffic 1000ft above them. Upon selecting the large Navigation Display with TCAS overlay, an aircraft was seen at close range and indicating 400ft below their current altitude. Again, this seemed strange and, when the indication immediately changed to indicate 100ft below, they spotted an aircraft in the climb forward and right of their position. The aircraft passed through their level, abeam, at approximately 100-150m. When the aircraft was spotted visually, it was passing down the RHS and it was too late to take any avoiding action. He immediately questioned ATC if they were aware of this aircraft and their reply was to ask what type it was. He replied a twin-prop fixed-wing. He reported that he filed an airborne Airprox.

He assessed the risk of collision as 'Medium'.

THE DIAMOND DA42 TWIN STAR PILOT reports that he was carrying out an IFR training detail. The take-off was an IFR departure at 1048 from RW27, and the clearance was a left turn after noise abatement on track to BADIM to climb to FL70, remaining outside CAS, squawking 7000 and a change from TWR to APP when appropriate. The student was briefed to track GST 280°M noise abatement to at least 1000ft AGL before turning left to intercept 223°M from GST to BADIM. Due to the work-load on departure, the left turn to BADIM usually happened around the 2.3-3.0 DME range and at approximately 2500-3500ft. He had no comments on the departure sequence in his notes of the student's performance, so he could only assume that he maintained the profile to suitable

standards and tolerances. The radar was unserviceable, so ATC could only provide a Procedural Service on departure. The conditions were good for VFR and, although he was looking for traffic, a fair percentage of his time was spent monitoring the student's actions and performance on the IR profile. He did not see any traffic on the departure and, due to the time elapsed since the Airprox, he did not recall any Traffic Information whether passed to him or overheard. He was unaware of any issue until contacted by the Airprox Board several weeks later.

THE GLOUCESTERSHIRE AERODROME CONTROLLER reports that Approach Control advised him that the EC145 was re-joining from the north-west and requesting to carry out an autorotation exercise from 2000ft overhead, which was agreed. The helicopter was sighted north-west of the airport and instructed to report ready to commence. The DA42 pilot had departed from RW27 on an IFR training flight joining CAS at BADIM, south-west of Gloucester. The pilot was transferred to Approach shortly after take-off. Traffic Information was passed to the EC145 pilot on a light aircraft carrying out an air-test overhead at 3000ft, which was acknowledged. Several minutes later, the helicopter was observed approaching the overhead from the west on an easterly heading. The pilot requested information on an aircraft at 2000ft that had 'just passed them' The pilot requested to re-position for the autorotation and, subsequently, stated he 'may need to file an Airprox'. This was acknowledged and the pilot was instructed to contact ATC after landing. However, no further contact was received. The radar/ATM was unserviceable.

THE GLOUCESTERSHIRE APPROACH CONTROLLER reports that an IFR departure clearance had been requested for the DA42 by the Aerodrome controller routing via BADIM. The clearance issued was "after departure, left turn on track BADIM, climb F070, ROCAS[1], released". At 1047, the EC145 pilot reported 6nm north-west, inbound, requesting a non-standard join at 2000 ft for a practice autorotation. Joining instructions were issued for the aircraft to join for "Heli North" with RW27 RH in use. The Aerodrome controller was advised, and the requirement for the 2000ft autorotation was accepted. Helicopters operated by the EC145 Company tend to join downwind to the runway-in-use when carrying out autorotation's, which is a frequent occurrence during their training flights. At the time, there was another aircraft operating in the overhead at 3000ft VFR on an air-test. The EC145 pilot was instructed to contact Tower at 3nm. The helicopter was observed on the ATM to approach what seemed to be more of a left-base leg for RW09 rather than RH downwind RW27, that is to say, it appeared to fly quite close to the RW27 climb-out. The DA42 departed RW27 at 1048 and made the standard noise abatement 10° right turn before turning left towards BADIM. The DA42 pilot's first call on the Approach frequency included that he was passing 1800ft, and, by this point, the aircraft was observed on the ATM to pass very close to the opposite direction inbound EC145. A Procedural Service was given to the DA42 pilot, and he was asked to report passing FL50 for transfer to Bristol Radar. He heard some of the Aerodrome controller's portion of a brief exchange with, he believed, the pilot of the EC145 about a fixed-wing aircraft. He recollected that he had heard the Aerodrome controller advising the EC145 pilot of the aircraft in the overhead at 3000ft. He then asked him if he had any other traffic as the EC145 pilot was enquiring about an aircraft getting close to him. He replied that it was probably the DA42 on the noise abatement 280° track. He looked out of the VCR window and saw that the two aircraft had passed abeam each other at a similar level. The DA42 pilot was transferred to Bristol Radar at 1055.

Factual Background

The weather at Gloucestershire was recorded as follows:

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METAR 041050Z 28012KT 9999 FEW016 SCT032 13/09 Q1025=
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The Gloucestershire ATZ is a circle, 2nm radius, centred on longest notified runway (09/27). Upper limit 2000ft.

[1] Remain outside controlled airspace.

Analysis and Investigation

CAA ATSI

ATSI had access to reports from the controllers and pilots involved, a report from the unit investigation, the area radar recordings and RTF of the unit position frequency. An interview with the Aerodrome controller was also conducted. Screenshots produced in the report are provided using the area radar recordings. Levels indicated are Flight Levels. All times UTC.

At 1047:00, the EC145 pilot, 6.6nm north-west of Gloucestershire Airport, contacted Gloster Approach and requested a downwind join at 2000ft for an autorotation. This was approved at 1048:00, Traffic Information was passed on traffic in the Gloucestershire overhead at 3000ft, and the helicopter pilot was then transferred to Gloster Tower at 1048:28. (The traffic in the overhead was a Titan T51 operating up to 3000ft with Gloster Tower) (Figure 1).

At 1048:32, the EC145 pilot reported on frequency with Gloster Tower at 2000ft for an autorotation which was acknowledged by the Aerodrome controller who requested him to report ready to commence the autorotation.

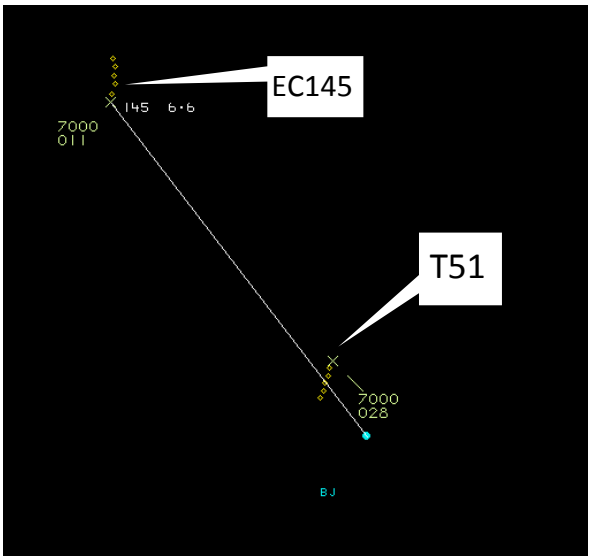

Figure 1 – 1047:00.

At 1049:12, the departing DA42 became visible on the area radar recording, having been previously cleared for take-off at 1047:21.

At 1049:30 (Figure 2), the DA42 pilot was transferred to Gloster Approach (but did not report on frequency until 1050:00).

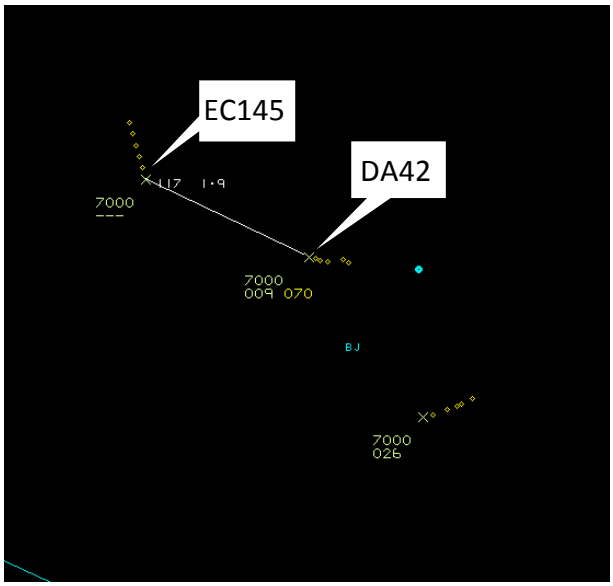

Figure 2 – 1049:30.

At 1050:10 the pilot of the EC145 asked the Aerodrome controller if he was aware of a fixed-wing aircraft which had just passed them. The Aerodrome controller asked him if he was referring to the traffic holding at 3000ft, to which the EC145 pilot replied that it was a twin-propelled aircraft at 2000ft, against which, at 1051:00, he reported his intention to file an Airprox.

Due to the area radar update rate, CPA was assessed to have taken place between 1050:07 and 1050:10 (Figures 3 & 4), with the aircraft separated by less than 0.1nm horizontal and 100ft vertical.

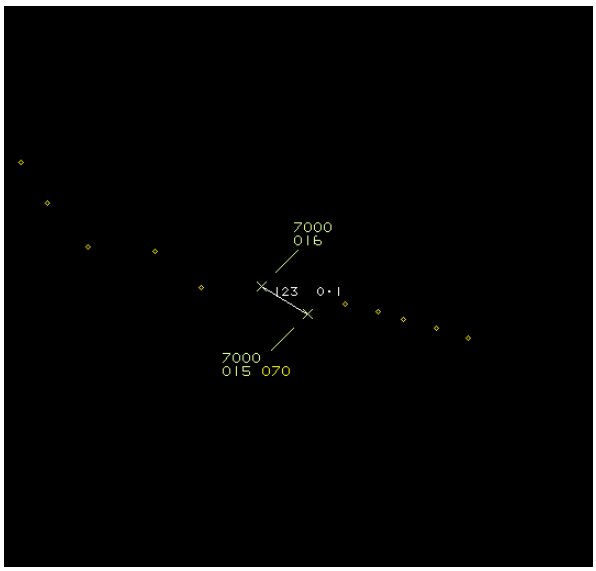

Figure 3 – 1050:07
Aircraft approaching each other

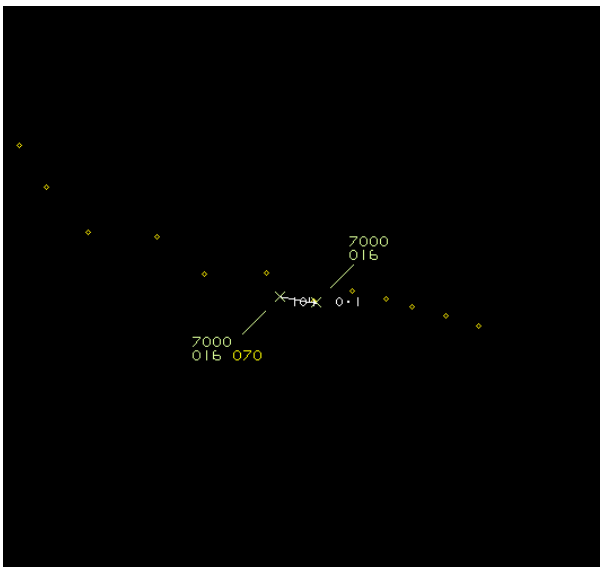

Figure 4 – 1050:10
Both aircraft having passed each other.

The DA42's IFR departure to the south-west included compliance with the Gloucestershire Noise Abatement Procedure for RW27:

> 'All departing aircraft are to execute a 10° right turn when passing the upwind end of the runway. Tracking 280° MAG, climb through 600ft QFE before turning left'.[2]

This effectively placed the DA42 north of the RW27 centreline on climb-out.

In the unit investigation report, and confirmed by the Aerodrome controller at interview, the routing of the inbound EC145 came as a surprise, because, although the EC145 pilot had requested a "downwind" join, the Aerodrome controller had not expected the EC145 pilot to commence the join as far west downwind as he did (Figures 5 & 6).

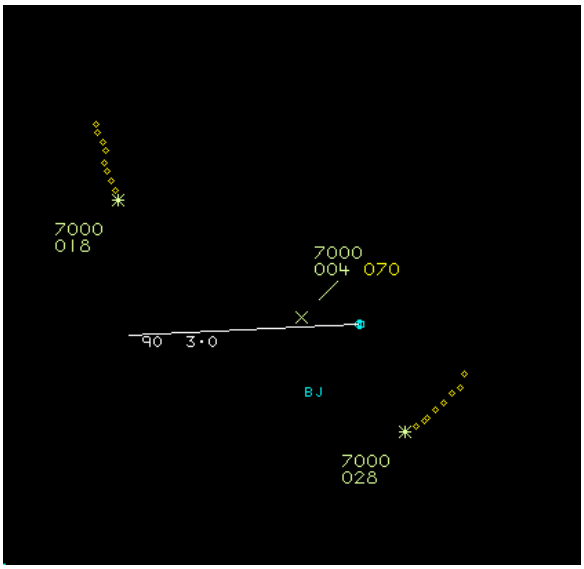

Figure 5 – 1049:12
With cursor set to RW27 centreline – 3nm.

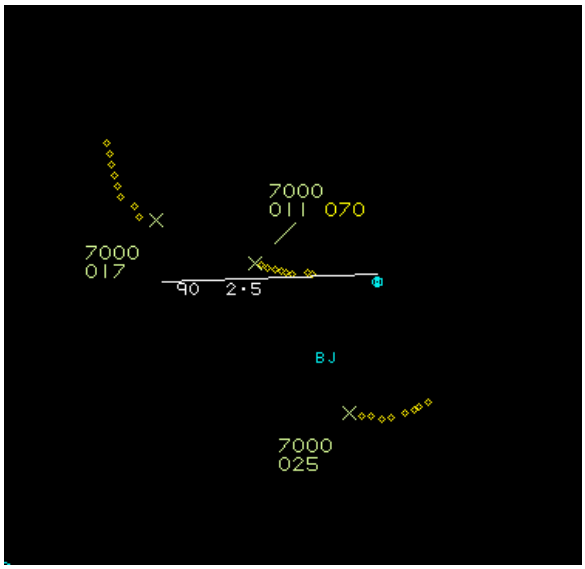

Figure 6 – 1049:44
EC145 commenced turn 2.5nm WNW of airport

[2] UK AIP AD 2.EGBJ-10 (14 Nov 2013)

The Aerodrome controller had expected the EC145 pilot to continue on a track directly towards the overhead before commencing a turn downwind, and would not normally pass Traffic Information on a north-westerly arrival to a south-westerly departure. On this basis, no Traffic Information on the departing DA42 had been passed to the EC145 pilot nor on the EC145 to the DA42 pilot, with the unit report stating that *"It is not routine to pass traffic information to departures on traffic joining overhead at 2000ft or vice versa…"*

The first indication to the Aerodrome (and Approach) controllers that the EC145 and DA42 had come into conflict was when the EC145 pilot requested information on the DA42. At that stage, the Aerodrome controller still believed that the only conflicting traffic was the T51 in the overhead. At interview, the Aerodrome controller also stated that had he realised that the DA42 and the EC145 were coming into conflict, he would not have transferred the DA42 pilot to the Approach controller when he did.

The Approach controller, in his report, stated that the DA42 pilot had contacted the frequency, *"and by this point the aircraft was observed on the ATM to pass very close to the opposite direction inbound"* (EC145). No Traffic Information was passed, but it would have been coincidental with CPA. The Approach controller also stated that after the EC145 pilot had asked about the other aircraft, he *"looked out of the VCR window and saw the two aircraft had passed abeam each other at a similar level."*

At Gloucestershire ATC, in a north-facing VCR, the Aerodrome and Approach controllers are in the same room although the Approach controller faces east. All coordination between the controllers is face-to-face.

There is a primary radar at Gloucestershire, which provides an Air Traffic Monitor (ATM) for the Aerodrome controller and a radar display for the Approach controller, who is permitted to provide a surveillance service from the Approach position. However, due to issues with the performance of the radar, it had been taken out of service, although a feed was still being sent to the ATM. The ATC unit reported that it was still being used as a tool for "situational awareness". The Aerodrome controller stated at interview however that he had personally elected not to use the ATM due to the unserviceability of the radar.

In the unit investigation report the radar return of the DA42 was reported as "*very poor and fading in and out"* but the return of the EC145 had been *"clearly seen 6nm NW of Gloucester."*

The Aerodrome controller had observed the EC145 out of the VCR windows when it had been "warned-in" by the approach controller, but had not continuously monitored it, and had been reasonably busy with other traffic. The routing of the EC145, which was considered by the unit to be non-standard, brought it into confliction with the departing DA42. Neither pilot had been passed Traffic Information. The Aerodrome controller was not aware that a confliction existed, because it was considered that the profiles of both flights would not normally require the passing of Traffic Information. Had the relative positions of the two aircraft been observed by the Aerodrome controller either by use of the ATM, or visual reference through the VCR windows, then it is assessed likely that Traffic Information would have been passed. Although the unit investigation highlighted that the DA42 was not clearly visible due to poor performance of the primary radar when their recordings were reviewed, it was agreed that the EC145 had been visible. Therefore, the decision to treat the ATM as unserviceable because of the unserviceability of the primary radar, but for the display to be left on and ignored, must be considered, under the circumstances, to have been a missed opportunity for the controller to *"provide information to aircraft on the position of other aircraft in the circuit or carrying out an instrument approach"*[3].

[3] CAP493 Manual of Air Traffic Services Part 1. Section 2 Chapter 1 Para 21 Aerodrome Traffic Monitor (ATM) 21.1 (4)

ATSI made the following recommendations as a result of the Airprox:

'That in the event that the primary radar is taken out of service, clear guidance is given to controllers as to whether or not the ATM continues to be made available, and if so, what limitations may be imposed. The term "Situational Awareness Tool" is not defined within CAP493.

That Gloucestershire ATC and the based helicopter operators agree what is considered as a standard "downwind" join and that this is published and available to all parties.

UKAB Secretariat

The EC145 and DA42 pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard[4]. If the incident geometry is considered as head-on or nearly so then both pilots were required to turn to the right[5]. An aircraft operated on or in the vicinity of an aerodrome shall conform with or avoid the pattern of traffic formed by other aircraft in operation[6].

Summary

An Airprox was reported when an EC145 and a DA42 flew into proximity at 1100 on 4th February 2016. Both pilots were carrying out training flights in VMC. The EC145 pilot was under VFR, in receipt of an Aerodrome Control Service and the DA42 pilot was under IFR, in receipt of a Procedural Service from Approach. The Aerodrome controller had not expected the tracks of the two aircraft to conflict. Consequently, Traffic Information was not issued to either pilot. CPA is judged to be less than 0.1nm horizontal and 100ft vertical. The DA42 pilot could not recall having seen any conflicting traffic after departure and the EC145 pilot only sighted the DA42 as it passed down his RHS.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board first discussed the actions of the DA42 pilot. It was noted that he had departed from RW27 on an IFR training flight to the south-west to join CAS at BADIM. The noise abatement departure procedure for the runway required a 10° right turn and to climb through 600ft before turning left. The radar recordings confirmed that the DA42 pilot did turn right on the procedure but did not commence the left turn until passing approximately 1500ft. Several members commented that the track of the aircraft shown on the radar recordings revealed that it had tracked slightly further north than the desired 280° track. The Board noted that the DA42 pilot could not recollect having seen the EC145, and they surmised that this was probably because the student pilot was flying heads-in and the supervising pilot was monitoring him. Although the pilot would have undoubtedly focused more on lookout had he been given Traffic Information by ATC, the Board commented that this was a timely reminder of the primary responsibility of non-handling pilots to ensure that a robust lookout was maintained in Class G airspace, over-and-above the duties of monitoring the handling pilot during IFR training or examination sorties.

For his part, the EC145 pilot had been inbound on a VFR training flight from the north-west and had requested, from the Approach controller, to join downwind for a practice autorotation from 2000ft. This had been agreed, and the Aerodrome controller had been advised. Before transferring the EC145 pilot to the Tower frequency he had been advised of traffic operating at 3000ft in the overhead. Traffic Information had not been issued about the departing DA42, and members noted that the EC145 pilot would not have heard the DA42 being cleared for take-off because this clearance had been passed before he had contacted the Tower frequency. Importantly, the DA42 pilot had not

[4] SERA.3205 Proximity.
[5] SERA.3210 Right-of-way (c)(1) Approaching head-on.
[6] SERA.3225 Operation on and in the Vicinity of an Aerodrome.

been transferred to the Approach frequency until about one minute after the EC145 pilot had reported joining for an autorotation. Therefore, the EC145 pilot had no way of knowing that the DA42 was airborne and potentially tracking towards him on the departure profile. A civil helicopter pilot member commented that it appeared from the radar recordings that the EC145 pilot had approached further west and south than normal before turning downwind. However, the EC145 pilot had not been advised of any traffic departing which might have conflicted with his approach and, had he been, then it was likely that he would have remained further north than he did; in his experience, at Gloucester, helicopter pilots tended to aim for the helicopter landing area north of the junction of the main runway and RW18/36 before turning downwind.

The Board then turned its attention to the actions of the controllers. It was noted that the radar had been taken out of service and that therefore a surveillance based service was not possible. However, members noted that a feed was still being sent to the Aerodrome Traffic Monitor (ATM) situated in the Aerodrome controller's position although he had elected not to use the ATM. Irrespective, several Civil ATC members were surprised that Traffic Information had not been passed to either pilot. Assumptions had been made about the tracks of the two aircraft which had resulted, incorrectly, in the belief that the two aircraft would not conflict. The DA42 was north of its expected track and the EC145 further west and south of its expected routeing. The Board noted that the ATSU report stated that *'It is not routine to pass traffic information to departures on traffic joining overhead at 2000ft or vice versa'.* However, ATC members commented that the pilot had been cleared, as stated in the CAA ATSI report, to join downwind, not direct to the overhead. The Board opined that if Traffic Information had been issued to either or both pilots then the possibility of a conflict would probably have been resolved. Consequently, it was decided that the cause of the Airprox was that the lack of appropriate Traffic Information allowed the pilots to fly into confliction.

When considering the risk, the Board took into account that neither pilot saw the other traffic in time to take any avoiding action. The EC145 pilot reported that the DA42 had passed through their level at approximately 100-150m and, by the time it had been seen, it was passing down the right-hand side of the helicopter. The Board noted that the EC145 had been equipped with TCAS 1 and that this had shown the presence of traffic below the helicopter which had surprised the pilot because the only traffic he had been informed of was 1000ft above him. Members opined that this confusion had probably delayed him making visual acquisition of the DA42 as he tried to reconcile the conflicting information. The radar recordings show that the two aircraft passed less than 100ft apart vertically and less than 0.1nm horizontally. In view of the very close miss distance, the fact that the DA42 pilot did not see the EC145, and that neither pilot had been able to take any avoiding action, the Board considered that luck had played a major part and that it had been purely fortuitous that a collision had not occurred. Consequently, the Airprox was assessed as risk Category A.

The Board noted and endorsed the ATSI recommendation about the use of the ATM for situational advice when the primary radar is taken out of service. While it is understood that the Aerodrome controller did not have any clear guidance whether to use the ATM, had he done so it would have shown him that the EC145 pilot was not positioning as he had expected but was approaching the RW27 climb-out lane; he could then have warned the EC145 pilot about the presence of the departing DA42, and vice-versa.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Lack of appropriate Traffic Information allowed the pilots to fly into confliction.

Degree of Risk: A.