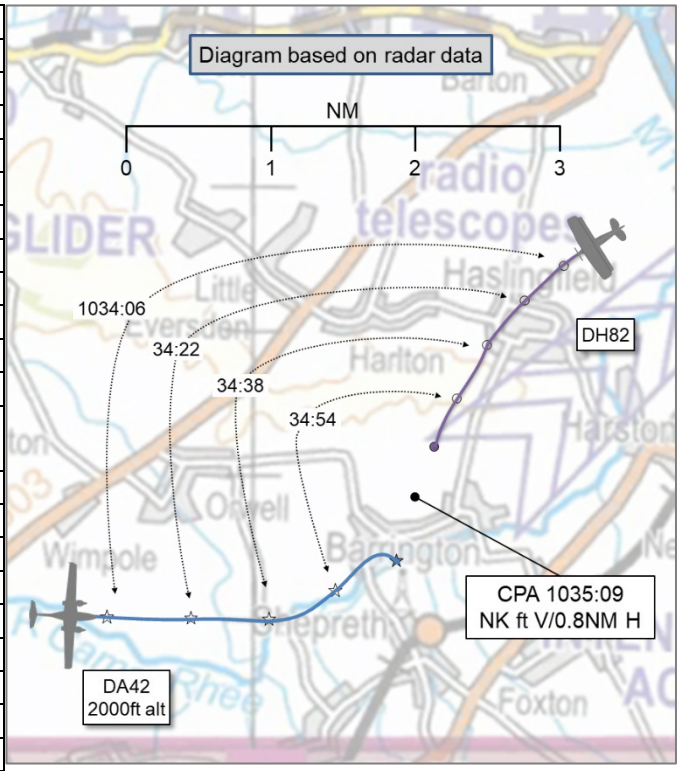
AIRPROX REPORT No 2021175

Date: 02 Sep 2021 Time: 1035Z Position: 5207N 00001E Location: 7NM SW Cambridge airfield

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	DA42	DH82
Operator	Civ FW	Civ FW
Airspace	London FIR	London FIR
Class	G	G
Rules	IFR	VFR
Service	Traffic	Listening Out
Provider	Cambridge App	Duxford Info
Altitude/FL	2000ft	NK
Transponder	A, C, S	Not fitted
Reported		
Colours	White	Camouflage
Lighting	Nav, Strobe, Landing	None
Conditions	VMC	VMC
Visibility	NR	5-10km
Altitude/FL	1800ft	NK
Altimeter	QNH (NK hPa)	QNH (NK hPa)
Heading	050°	NK
Speed	125kt	70kt
ACAS/TAS	Not fitted	SkyEcho
Alert	N/A	None
Separation at CPA		
Reported	0ft V/500m H	NK V/NK H
Recorded	NK V/0.8NM H	



THE CAMBRIDGE OJTI reports that they were working as an OJTI on Cambridge Radar, providing services on 120.965MHz. They had been in position for 35min and were well rested, not having controlled so far that shift. They were providing OJTI to an advanced trainee who is also valid in ADI and APP at Cambridge, albeit the trainee had only controlled a small number of hours in the last month due to sickness and annual leave. The traffic levels were low and they were providing a Traffic Service to a DA42, routing to [destination airfield], from [departure airfield], who was conducting a training RNP on RW05. The trainee provided Traffic Information to [the pilot of the DA42] on unknown traffic that was in the vicinity of the final approach track, doing so using the correct position of the traffic, but failing to do so using the correct method of clock code. This was not corrected as [the OJTI] was happy that the aircraft was far enough away to not correct the slip and [it] would be debriefed after the session. The Traffic [Information] was correctly updated as it became closer, this time using clock code. As the trainee was passing the Traffic Information they instructed the trainee [that there may be a need] to take avoiding action should [the DA42 pilot] not report visual with the traffic. [The DA42 pilot] was not visual and, as such, avoiding action was passed with a climb and turn instruction. The conflicting aircraft was non-transponding and, as such, they did not know whether the climb would increase separation, but this would at least give clearance over the Duxford ATZ. The instructor of [the DA42] was overheard taking control from their student and reported they required the avoiding action to be passed again. The trainee [controller] thought that [the DA42 pilot] had reported taking the avoiding action and as such replied "Roger". The OJTI took control and passed the avoiding action again, although it was noted that the aircraft was already in the turn when the pilot asked for the update. They then handed control back to the student as the distance between the aircraft was now increasing. The instructor of [the DA42] reported having seen a bi-plane at the same level, opposite direction. The OJTI informed the APS ATSA[1] that it was their intention to file an Airprox and, as such, they required relief from position, asking [the ATSA] to make the relevant calls to ensure this took place immediately. It was their responsibility

[1] Air Traffic Services Assistant.

to arrange such relief as the duty watch supervisor. They then took back control from the trainee who had offered further vectors to [the DA42 pilot]. [The DA42 pilot] had been placed under a vector of 320° to be repositioned; however, the unknown aircraft changed direction (by approximately 180°) and routed towards [the DA42] again. They opted to vector [the DA42 pilot] further away from the conflict before resuming vectors to the IAF for the RNP05. Once [the DA42 pilot] was established on their approach and working Cambridge Tower, they opted to close the APS function to hand over to an APP ATCO.

THE DA42 PILOT reports that they were completing a training flight with a student and were under a Traffic Service. They had been cleared for the RNP procedure RW05 via BEPOX and had been advised of an aircraft that was in the vicinity of the FAT[2], however, it was not in communication with Cambridge ATC. On passing the intermediate fix at 2000ft, a descent was commenced to 1600ft in accordance with the vertical profile of the procedure. Due to the poor visibility, they allowed the student to fly without the use of an instrument hood. Due to the Traffic Information from ATC they discussed with the student that this was [a situation] where maintaining situational awareness of Traffic Information was essential. While on the FAT and in the descent, ATC updated the Traffic Information. The aircraft was then seen at the same level on a reciprocal course. At the same time the aircraft was seen, ATC instructed them to take avoiding action.

The pilot assessed the risk of collision as 'Medium'.

THE DH82 PILOT reports that they were operating out of [departure airfield] on the date and time in question related to the Airprox. They undertake multiple instructional flights per day for a training organisation based at [departure airfield] and have not been involved in any Airprox that they are personally aware of. Consequently, they do not have any reason for any specific recollection of the flight concerned. The flight was instructional (Exercise 3), with the student pilot handling the controls for the majority of the flight. They elect to use a [TAS device] connected to a moving map for additional situational awareness, which they run on a kneeboard tablet, connected via Bluetooth (for warnings) to their headset. Whilst they [report being aware that] this does not provide a definitive solution, it is part of their Threat and Error Management undertakings for both instructional and personal flights, whilst also allowing warnings to be given to them verbally enabling a good lookout to be maintained. At no point on this, or any other flight, has [the TAS device] warned them of any aircraft close enough to warrant an Airprox (and nor have they visually seen an aircraft close enough to warrant an Airprox). On some occasions, (if operating just to the north of Duxford), they purposely elect (due to Threat and Error Management considerations), to use the Duxford Information frequency rather than changing to Cambridge Approach. This is due to Cambridge sometimes not being able to offer any radar assisted service, and known warbird traffic operating to the north of Duxford which remains on the Duxford frequency. Their understanding is that Cambridge usually inform Duxford of any inbound IFR traffic for the IAP to enable Duxford Information to inform relevant aircraft on frequency operating to the north. They feel that this option means that they are more situationally aware of traffic in the area. They report that they are not aware of any Airprox, nor have they been told of the location of the Airprox other than it being "in the vicinity of Cambridge (EGSC)"

THE DUXFORD SUPERVISOR reports that the incident was notified to them on 17th September 2021. Prior to that they had no knowledge of this Airprox as it had not been previously reported to them either by telephone or R/T. They have spoken with the FISO [who was] on frequency at the time, who reports that they are unaware of any Airprox incident involving [the DH82]. They have reviewed the Duxford R/T recordings for the times given and there was no indication of any incident occurring. They have not carried out any further investigation.

Factual Background

The weather at Cambridge was recorded as follows:

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METAR EGSC 021050Z 04008KT 020V080 9999 BKN021 16/11 Q1030
METAR EGSC 021020Z 04007KT 010V080 9999 BKN021 16/11 Q1030
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[2] Final Approach Track.

Analysis and Investigation

CAA ATSI

The DA42 pilot was on a training flight and was receiving radar vectors for an RNP approach to RW05 at Cambridge. They were in receipt of a Traffic Service (with "reduced Traffic Information due to limited radar performance") from the Cambridge radar controller who was a trainee controller under instruction. The DH82 pilot was also on a training flight and was on the Duxford Information frequency. The pilot reported being in receipt of a Basic Service from "Duxford or Cambridge", but ATSI could find no evidence to support this.

At **1027:45**, having passed the missed approach instructions to the DA42 pilot, the Cambridge controller then turned them onto a base leg for their approach. At **1028:30** the controller descended the DA42 to 3000ft. On the area radar replay, a primary-only contact believed to be the DH82 had only just appeared (Figure 1).

Figure 1 – 1028:30

At **1028:46** a telephone call was made to Duxford by Cambridge advising them that the Cambridge 05 RNP was active with a DA42. At **1028:50** the Duxford FISO was heard to call the pilot of the DH82 three times without receiving a reply, and once again at **1029:46** (Figures 2 and 3).

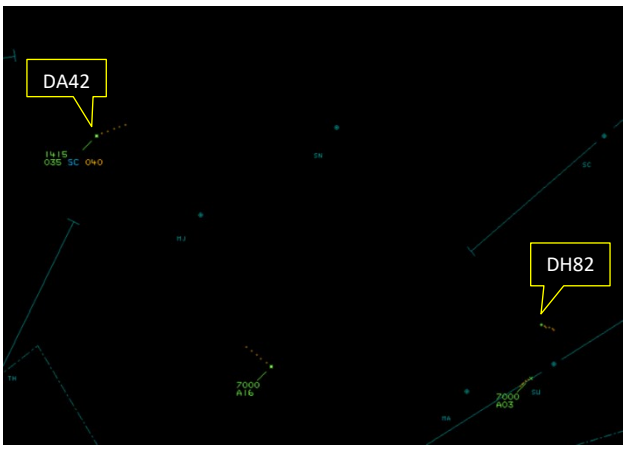

Figure 2 – 1028:50

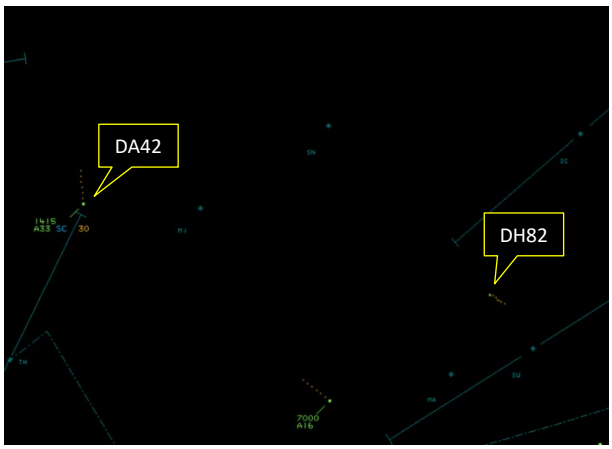

Figure 3 – 1029:46

At **1029:57** the Cambridge controller instructed the DA42 pilot to turn on to a heading of 110°. Then, at **1031:20** the controller gave the DA42 pilot their position as being 2 miles west of BEPOX, (the Initial Approach Fix for the RNP approach to RW05 at Cambridge), and cleared them for the approach requesting a report as they passed BEPOX (Figure 4).

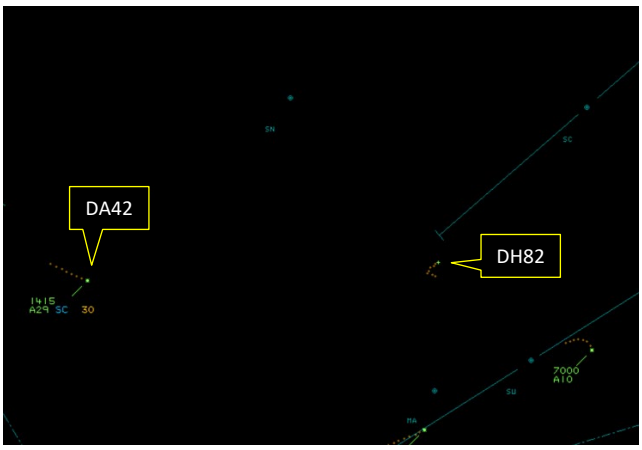

Figure 4 – 1031:20

At **1032:10** the contact believed to be the DH82 was seen to pass through the Cambridge RW05 final approach (Figure 5).

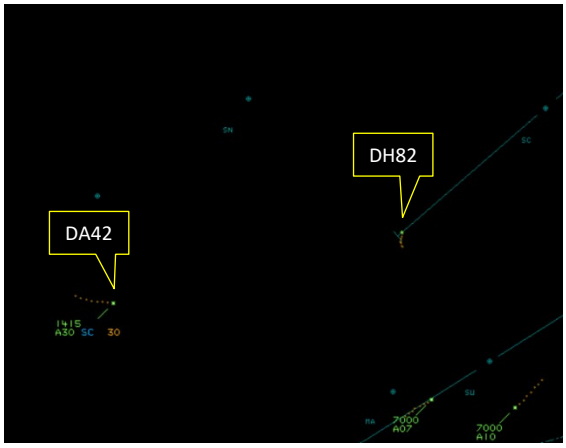

Figure 5 – 1032:10 (8NM lateral separation between the aircraft)

At **1032:48** the pilot of the DA42 reported passing BEPOX and they were instructed to report established on the final approach track. The DH82 was 7NM to the east-northeast of the DA42 at this time (Figure 6).

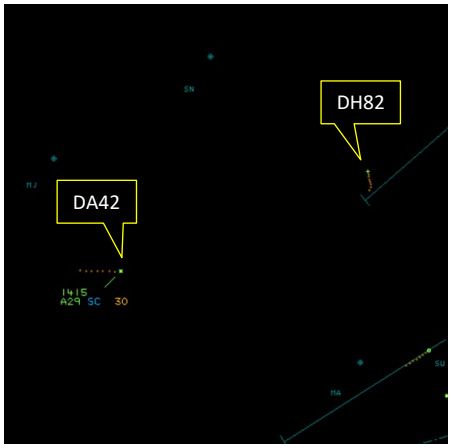

Figure 6 – 1032:48

At **1033:58** the Cambridge controller passed the following Traffic Information to the pilot of the DA42: "*traffic just operating half mile west of a 4 mile final, manoeuvring, no height information. Advise if you get that traffic in site* [sic] *at any time (unintelligible) wish to break off the approach*". On the area radar replay, the contact believed to be the DH82 had disappeared 20sec earlier, 5.8NM to the northeast of the DA42, and then reappeared 4.2NM to the northeast (Figure 7).

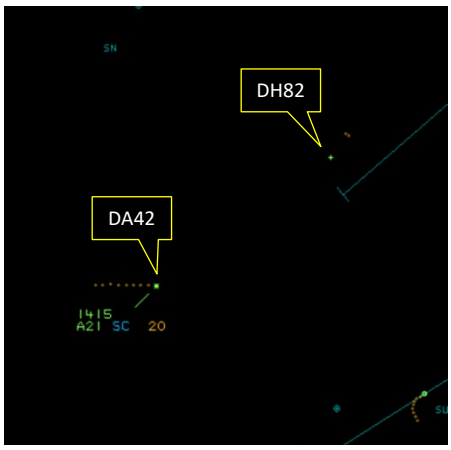

Figure 7 - 1033:58

The DA42 pilot replied; "*er wilco, and sorry, say again the range to the threshold*", The controller replied; "*he's now just tracking southwest-bound, about just west of a four and a half mile final*".

At **1034:42** the Cambridge controller updated the Traffic Information; "*previously mentioned traffic is now in your left 11 o'clock, 2 miles, no height information. Converging, opposite direction. Do you have the traffic in sight?*" (Figure 8).

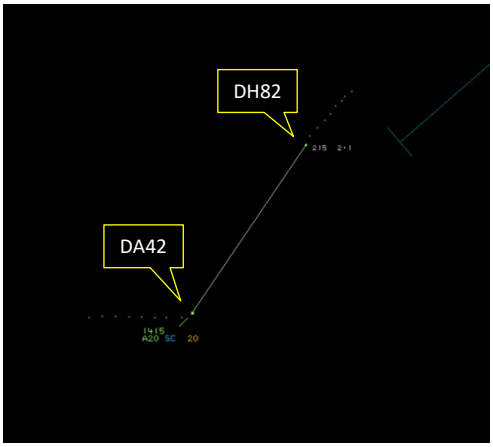

Figure 8 – 1034:42

The DA42 pilot replied; "*negative and er I'm looking*".
Then at **1034:58** the controller instructed the DA42 pilot "*avoiding action turn right heading 090°, climb to altitude 3000ft*" (Figure 9).

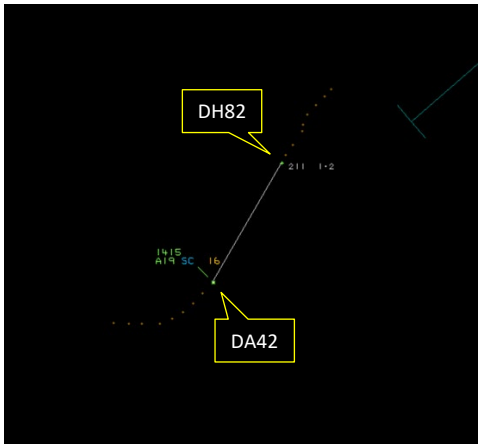

Figure 9 - 1034:58

The DA42 pilot was heard to say "*control*" before replying "*er just taking avoiding action – he's directly in front*".

At **1035:06** the DA42 was seen to be in a turn to the right (Figure 10), and at **1035:09** a new controller, believed to be the OJTI was heard to say; "*avoiding action. Turn right now heading 090°.*" This was coincidental with CPA (Figure 11).

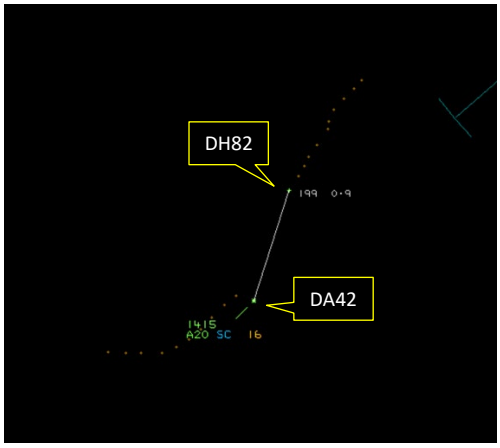

Figure 10 – 1035:06

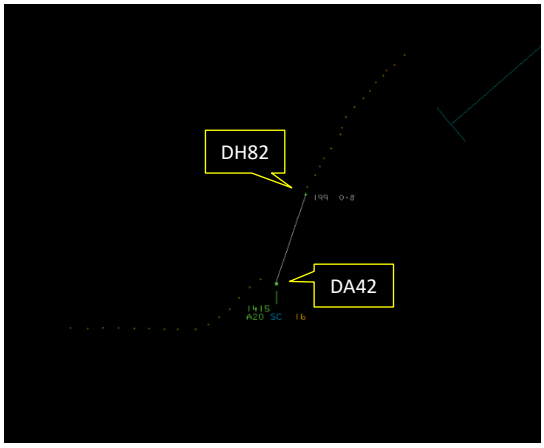

Figure 11 – 1035:09 - CPA

The pilot of the DA42 subsequently reported the second aircraft as being a biplane, and when questioned by the controller, advised that it was "*exactly the same level as I broke off there, and converging straight towards me as well*".

ATSI had access to copies of reports from both pilots, the Cambridge controller and Duxford FISO reports, and a copy of the Cambridge interim review report. ATSI reviewed RTF recordings from both units and the area radar replay supplied by NATS. Screenshots have been taken from that area radar replay and do not represent the picture available to the Cambridge controller at the time.

The report from Cambridge ATC was filed by the OJTI, who stated that the "high-hour" trainee controller was already qualified in Aerodrome and Approach. They highlighted the fact that the initial Traffic Information was not passed as a position relative to the DA42, but that they did not correct at the time as the aircraft were still well apart and that they intended to include it in the debrief later. The trainee subsequently passed updated Traffic Information correctly. The OJTI stated that they had instructed the trainee to issue avoiding action should the pilot of the DA42 not report visual with the other traffic. There was some doubt in the OJTI's mind as to whether the pilot had taken the avoiding action subsequently issued by the trainee, and so took the frequency and repeated it, although by that point the OJTI reported seeing the DA42 in a turn away from the DH82, and which was evidenced from the radar replay.

CAP774 UK Flight Information Services (Chapter 3 Traffic Service) states:

> *When providing headings/levels for the purpose of positioning and/or sequencing or as navigational assistance, the controller should take into account traffic in the immediate vicinity based on the aircraft's relative speeds and closure rates, so that a risk of collision is not knowingly introduced by the instructions passed. However, the controller is not required to achieve defined deconfliction minima and pilots remain responsible for collision avoidance even when being provided with headings/levels by ATC*

The first instance of Traffic Information being passed was generic and, whilst providing some situational awareness, the pilot might have benefited from it being more specific to give greater time to visually acquire the DH82. This was evidenced by the DA42 pilot asking for the information to be repeated in relation to the threshold. Also, whilst avoiding action was passed by the trainee controller

and then the OJTI, neither used the standard phraseology which includes the action “immediately”, as in “avoiding action, turn right immediately….”.

The follow-up report by Cambridge ATC indicated that they intend to approach Duxford to deliver a presentation on their operations to the GA pilots based there, and to others in the local area.

Although, at the time of this report, and unconfirmed by the unit, the Duxford FISO does appear to have attempted to advise the pilot of the DH82 about the activity on the 05 RNP at Cambridge, having made four attempts to contact them without success just after the phone call from Cambridge had been received.

The pilot of the DA42 reported becoming visual with the DH82 at the same time as the Cambridge controller issued avoiding action.

The pilot of the DH82 stated that they did not recall this event, see any aircraft in their proximity to warrant an Airprox report, nor receive any warning from their [TAS] device. They reported that they did not have a transponder fitted to the aircraft.
There is no record of the DH82 pilot making any call to Cambridge ATC for a service. Also, if the Duxford FISO was trying to advise them about the activity on the Cambridge 05 RNP, the pilot apparently did not hear the calls from the Duxford AFISO and so could not have been informed about Cambridge IFR traffic.

To conclude, Traffic Information was passed by the Cambridge controller and, believing that an actual risk of collision existed, subsequently issued avoiding action. Ultimately the pilot of the DA42 remained responsible for collision avoidance.

The pilot of the DH82 was neither transponding nor receiving any ATC service, and flew through a published instrument approach (twice) and into such proximity to the DA42, that the Cambridge controller believed there to be a risk of collision.

Cambridge ATC is reminded of its obligations under Regulation (EU) 376/2014 as retained (and amended in UK domestic law) under the European Union (Withdrawal) Act 2018, Article 4, paragraphs 6(d) and 7, to submit a mandatory occurrence report, within 72 hours of when they are first made aware of an occurrence, and to conduct an analysis of the occurrence, in order to identify any safety hazards, followed by submission of follow up reports, in accordance with the 30 day and 3 month timescales contained in Article 11 of the regulation.

Cambridge Air Traffic Services investigation

While operating on RW05 a DA42 pilot was operating a training flight from [departure to destination airfield] and conducting an RNP approach to RW05 under a Traffic Service from Cambridge Radar with a trainee APS controller under the supervision of a Radar OJTI. During the approach, while on an approximate 9NM final, the APS trainee called Traffic Information to the [DA42 pilot] on a primary contact manoeuvring on a 4.5NM final. When the DA42 was on an approximate 8NM final the Traffic Information was updated, after this update, at 1034:55, avoiding action was issued by the trainee ATCO, [the DA42 pilot] requested that the transmission was resent as they were [already] undertaking avoiding action. At this point the OJTI reissued the avoiding action. At 1035:41 the [DA42 pilot] reported that it was a biplane that had been converging straight for them. Whilst vectoring the aircraft for a second approach, further vectoring was needed to avoid the same aircraft which was still manoeuvring on the final approach.

The OJTI reports that they were providing a Traffic Service to [the DA42 pilot], who was conducting a training RNP on RW05. The trainee provided Traffic Information to [the DA42 pilot] on unknown traffic that was in the vicinity of the final approach track, doing so using the correct position of the traffic but failing to use the correct method of clock code. This was not corrected as they were satisfied that [the separation was sufficient and] it would be debriefed after the session. The Traffic Information was correctly updated as it became closer, this time using clock code. As the trainee

was passing the Traffic Information the OJTI instructed the trainee to issue avoiding action should [the DA42 pilot] not report visual with the traffic. [The DA42 pilot] was not visual and, as such, avoiding action was passed with a climb and turn instruction. The instructor of [the DA42] was overheard taking control from their student and reported that they required the avoiding action to be passed again. The trainee [ATCO] thought that [the DA42 pilot] had reported taking the avoiding action and as such replied "Roger". They took control from the trainee and passed the avoiding action again, although it was noted that the aircraft was already in the turn when they asked for the update. They handed control back to the student as the distance between the two aircraft was now increasing. The instructor of [the DA42] reported having seen a bi-plane at the same level, opposite direction. Once [the pilot of the DA42] was established on their approach and working Cambridge Tower, they opted to close the APS function to hand over to an APP ATCO who was able to continue services whilst band-boxed.

The trainee ATCO reports that they were training in APS while a DA42 [pilot] was conducting a training RNP approach to RW05. Prior to the [DA42] passing BEPOX on the approach they had noticed a primary contact operating just to the south of the ATZ, at the entrance to the Cambridge/Duxford gap. When the [DA42 pilot] turned onto the FAT, generic Traffic Information was passed to them on the primary contact which was now operating on about a 4.5NM final. They called the tower to ask if they could get visual contact with the aircraft. The [DA42 pilot] was not visual so they updated the Traffic Information and when [the pilot] was still not visual they issued avoiding action, as the primary contact had turned towards them. [The trainee ATCO] did not reissue the avoiding action message as they thought that the pilot had said [that they were] taking avoiding action. The [DA42 pilot] was then vectored back towards BEPOX to recommence their approach.

The investigator concluded that both the trainee ATCO and OJTI acted in accordance with their licences and there are no immediately apparent concerns as to ongoing competence. Pending a full investigation, they would have no concerns to reinstate both to active duty. They state that this was the third serious incident resulting in avoiding action in a short period of time involving the instrument approach to RW05 at Cambridge. Unfortunately, it is an ongoing and previously identified issue with aircraft operating into and out of both Duxford and Fowlmere aerodromes. The risk of airborne conflict is currently the airport's highest and, in the light of the two most recent incidents, they would recommend that a full investigation is undertaken to include revisiting the risk assessment to confirm that the included mitigations remain robust and effective and that all risks remain ALARP.

UKAB Secretariat

The DA42 and DH82 pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard.[3] If the incident geometry is considered as converging then the DH82 pilot was required to give way to the DA42.[4] If the incident geometry is considered as head-on or nearly so then both pilots were required to turn to the right.[5]

Summary

An Airprox was reported when a DA42 and a DH82 flew into proximity 7NM SW of Cambridge airfield at 1035Z on Thursday 2nd September 2021. The DA42 pilot was operating IFR and the DH82 pilot was VFR, both pilots were in VMC, the DA42 pilot was in receipt of a Traffic Service from Cambridge Approach and the DH82 pilot was listening out on the Duxford Information frequency.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from both pilots, radar photographs/video recordings, reports from the air traffic controllers involved and reports from the appropriate operating authorities. Relevant

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

contributory factors mentioned during the Board's discussions are highlighted within the text in bold, with the numbers referring to the Contributory Factors table displayed in Part C.

Due to the exceptional circumstances presented by the coronavirus pandemic, this incident was assessed as part of a 'virtual' UK Airprox Board meeting where members provided a combination of written contributions and dial-in/VTC comments.

The Board first considered the actions of the DA42 pilot. Members noted that they had been operating under a Traffic Service and had been in receipt of Traffic Information regarding the relative location of the DH82 from the Cambridge controller. The Traffic Information that had been passed had not contained any altitude information as this had not been available to the controller, the result of which had been that the DA42 pilot had had only generic situational awareness of the DH82 (**CF4**). The Board agreed that the DA42 pilot had been established on the final approach track and about to commence descent when they had become visual with the DH82 traffic, and considered that the proximity of the DH82 had caused the DA42 pilot concern (**CF6**) and so they initiated their own avoiding action.

Next the Board discussed the actions of the DH82 pilot including their area of operation. Members noted that the DH82 pilot had crossed the "feathers" that indicate an instrument approach for Cambridge airport. Reference was made to guidance contained in the Skyway Code[6] and on VFR charts which states that, "*pilots are recommended to contact the aerodrome ATSU if flying within 10NM of an aerodrome marked with such feathers*", and that "*VFR traffic operating near aerodromes outside controlled airspace should be aware that there may be instrument traffic using IAPs and should avoid crossing them at similar altitudes to that of the procedure, unless talking to the relevant ATSU*". The DH82 pilot, however, had not been in contact with the Cambridge controller and members considered that this had been contributory to the Airprox (**CF2**). Local arrangements were then discussed by the Board, specifically the Letter of Agreement (LoA) that exists between Cambridge and Duxford, under which the Cambridge controller informs the Duxford AFISO of instrument approach traffic to enable that information to be passed to pilots on their frequency, however the DH82 pilot did not respond to calls from the AFISO, thus rendering this element of the LoA redundant (**CF3**). The Board noted that the DH82 pilot had had a TAS device available to them but there had been no report of an alert being generated when one might have been expected (**CF5**) which, in combination with the DH82 pilot not being in contact with an ATSU, resulted in them having no situational awareness regarding the presence of the DA42 (**CF4**).

Members looked next at the actions of the Cambridge controller, OJTI and the Duxford AFISO and agreed that all had done as much as they had been able to do to prevent the event from happening and that the proximity of the aircraft as observed by the Cambridge OJTI had given them cause for concern (**CF1**). It was observed by members that there had been a number of Airprox of a similar nature in this area over the past year.

Finally, the Board considered the risk involved in this Airprox. As the DH82 did not have a transponder there had been no altitude information on the NATS radar replay and pilot had been unable to provide a GPS log file for their flight. Consequently, it had not been possible to determine a vertical separation for the recorded CPA. The Board considered the estimated vertical separation reported by the DA42 pilot and members noted that the pilot had assessed the risk of collision to be 'medium', whilst the DH82 pilot reported that, in their opinion, there had been no Airprox. Members noted that the DA42 pilot had sighted the DH82 early enough to take avoiding action. The Board concluded that there had been no risk of collision but that safety had been reduced. Consequently, the Board assigned a Risk Category C to this event.

[6] https://publicapps.caa.co.uk/docs/33/CAP1535S%20Skyway%20Code%20Version%203.pdf

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

Contributory Factors:

	2021175			
CF	**Factor**	**Description**	**ECCAIRS Amplification**	**UKAB Amplification**
	Ground Elements			
	• Situational Awareness and Action			
1	Human Factors	• Expectation/Assumption	Events involving an individual or a crew/ team acting on the basis of expectation or assumptions of a situation that is different from the reality	Concerned by the proximity of the aircraft
	Flight Elements			
	• Tactical Planning and Execution			
2	Human Factors	• Communications by Flight Crew with ANS	An event related to the communications between the flight crew and the air navigation service.	Pilot did not request appropriate ATS service or communicate with appropriate provider
	• Situational Awareness of the Conflicting Aircraft and Action			
3	Human Factors	• Monitoring of Communications	Events involving flight crew that did not appropriately monitor communications	
4	Contextual	• Situational Awareness and Sensory Events	Events involving a flight crew's awareness and perception of situations	Pilot had no, late or only generic, Situational Awareness
	• Electronic Warning System Operation and Compliance			
5	Human Factors	• Response to Warning System	An event involving the incorrect response of flight crew following the operation of an aircraft warning system	CWS misinterpreted, not optimally actioned or CWS alert expected but none reported
	• See and Avoid			
6	Human Factors	• Perception of Visual Information	Events involving flight crew incorrectly perceiving a situation visually and then taking the wrong course of action or path of movement	Pilot was concerned by the proximity of the other aircraft

Degree of Risk: C

Safety Barrier Assessment[7]

In assessing the effectiveness of the safety barriers associated with this incident, the Board concluded that the key factors had been that:

Flight Elements:

Tactical Planning and Execution was assessed as **partially effective** because the DH82 pilot was not in contact with an appropriate ATS provider.

Situational Awareness of the Conflicting Aircraft and Action were assessed as **partially effective** because the DA42 pilot had only generic situation awareness of the DH82, whereas the DH82 pilot had no awareness of the DA42 prior to sighting it.

Electronic Warning System Operation and Compliance were assessed as **ineffective** because the TAS device on the DH82 did not alert to the presence of the DA42 when one would have been expected.

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

Airprox Barrier Assessment: 2021175 Outside Controlled Airspace