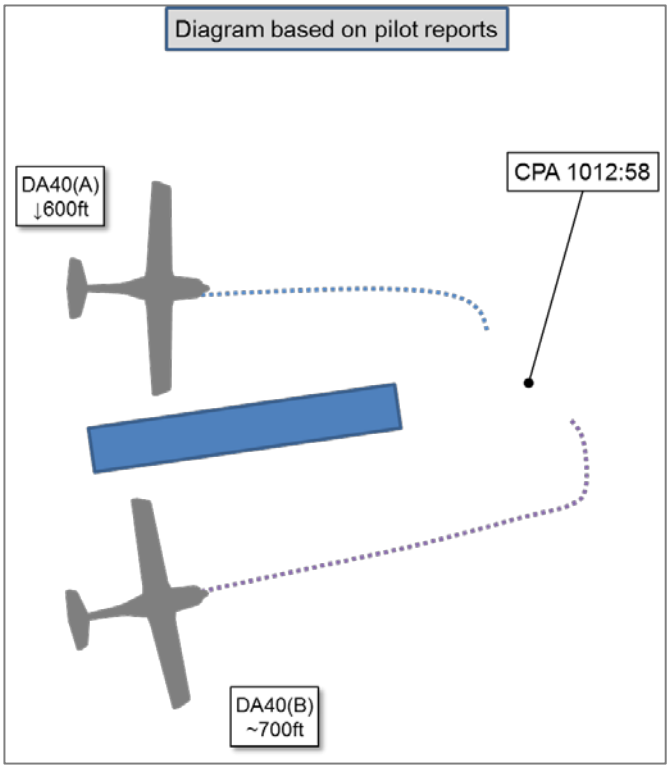
AIRPROX REPORT No 2019330

Date: 05 Dec 2019 Time: 1012Z Position: 5046N 00150W Location: Bournemouth

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	DA40(A)	DA40(B)
Operator	Civ FW	Civ FW
Airspace	Bournemouth CTR	Bournemouth CTR
Class	D	D
Rules	VFR	VFR
Service	ACS	ACS
Provider	Bournemouth	Bournemouth
Altitude/FL	600ft	NK
Transponder	A, C, S	A, C, S
Reported		
Colours	White	NK
Lighting	HISL, Nav	NK
Conditions	VMC	NK
Visibility	NK	NK
Altitude/FL	700ft	NK
Altimeter	QNH	QNH
Heading	NK	NK
Speed	90kt	NK
ACAS/TAS	TAS	TAS
Alert	None	TA
Separation		
Reported	Not Seen	NK
Recorded	NK V/ ~0.5NM H[1]	



THE BOURNEMOUTH ADI reports that he was operating with ADI and Ground Movements Control (GMC) band-boxed, there were two low-hours solo students in the circuit and a third was launched. When DA40(A) turned downwind he was given Traffic Information on traffic joining from the north and was asked if he could try a different radio because the one he was using was distorted. About midpoint downwind, he reported downwind and was advised that he was No2 and given Traffic Information on DA40(B) which was No1 [in the left-hand circuit]. The right-hand downwind track of DA40(A) was not parallel with the runway and was on a slightly converging track with the final approach. An aircraft was positioning from the north, No3 to the two subject aircraft in the circuit and the controller received notification from Approach of an arriving DA42 joining for an ILS. Additionally, one aircraft was taxiing and 3 vehicles including a tanker had called to cross the runway. After dealing with the ground traffic, he observed that DA40(A) appeared to be turning finals in front of the aircraft he had been given Traffic Information on and should have followed. He told both pilots to turn away from each other initially and then told them to re-position on base-leg. DA40(A) pilot appeared disoriented and so was told to track north.

THE DA40(A) PILOT reports that he was a solo-student conducting a circuit to RW26RH. During the crosswind turn, he was informed by ATC that his radio was distorted so he changed to Box 2 whilst turning downwind. As a consequence, his downwind call was slightly later than usual. ATC gave Traffic Information about an aircraft that was joining from the north and would intercept right-base behind him. He was also aware of another DA40 that had just conducted a touch-and-go and was joining the right-hand circuit. He was told he was No2 to an aircraft that was downwind in the left-hand circuit and he was aware that this was also a solo-student. He looked for this aircraft, but couldn't see it due its distance from him on the opposite side of the runway. He heard the other pilot call left-base and, a short while later, ATC requested that he report on final approach. He thought the other aircraft was about to turn onto final approach and he started to turn right onto right-base. Shortly afterwards, ATC told him

[1] Separation data derived from Bournemouth radar

that both aircraft were on base-leg on opposite circuit directions. When challenged by ATC, he reported that he was not visual and they instructed him to turn right. As he was turning right, he looked for the inbound traffic and the other aircraft downwind and, at this stage, he was unsure where ATC wanted him to re-position. A short while later ATC instructed him to turn onto a northerly heading and establish an orbit at the end of the downwind leg. He did not receive a warning from his TAS.

THE DA40(B) PILOT reports that he was running late and trying to get in as many circuits as possible to complete his lesson. He heard over the radio that the DA40(A) was having radio issues and had to change to Box 2. He was told he was No1, turned onto final and, about a mile and half from the threshold, his TCAS warning alerted and he heard ATC tell DA40(A) to make an immediate right turn. He became visual with DA40(A) and made an immediate left-turn and started climbing back up to circuit height. He made a slight mistake by forgetting to add more power, noticed his speed was decreasing and put the power in 5-10sec later. He continued tracking south and was waiting for the radio calls to stop before asking whether he should turn around back onto left-base. He didn't remember getting instructions from ATC until he asked, although he acknowledged that he could have mis-remembered and thought that, with hindsight, he could have continued his approach to land. After getting in a call to ATC, he was told he was No5 and was to land instead of touch-and-go.

Factual Background

The weather at Bournemouth was recorded as follows:

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EGHH 050950Z VRB01KT 8000 FEW020 02/02 Q1022
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Analysis and Investigation

CAA ATSI

Screenshots are taken from the Bournemouth ATM screen.

In addition to the two Airprox DA40s, the Bournemouth Tower controller had another DA40 in the circuit, a DA62 inbound from the north and a DA42 inbound from the south-east for an ILS approach. At 1010:00 DA40(B), reported downwind left-hand (Figure 1).

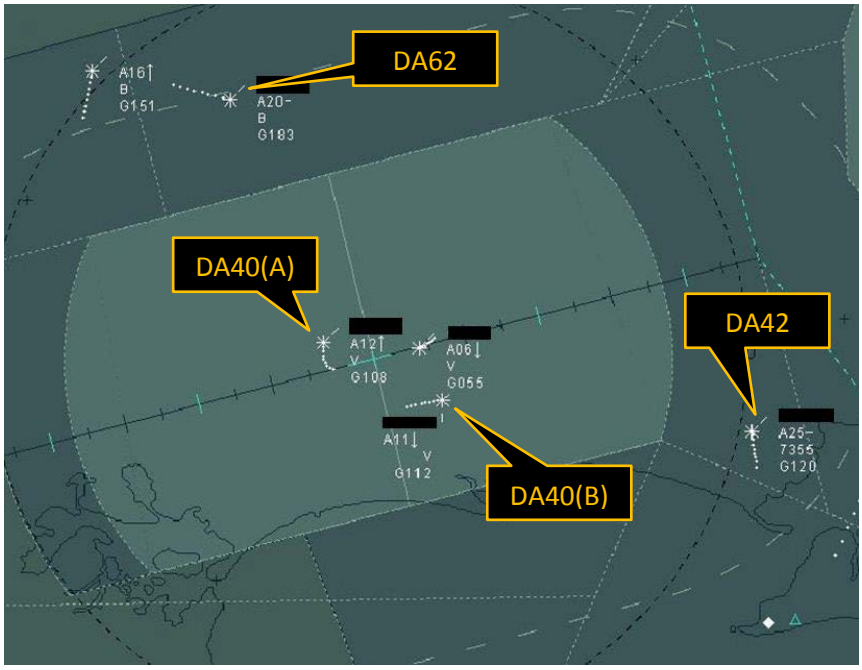

Figure 1 – 1010:00

The controller was dealing with a number of vehicular movements on the airfield and one aircraft ground movement when, at 1010:20, the radar controller pre-noted the DA62 from the north and the DA42 on a 13-mile final. At 1011:00, the DA62 pilot called the Tower controller and was instructed to report right-base and advised that the right-hand circuit was active. The controller then passed Traffic Information on the DA62 to the DA40(A) pilot who had turned downwind right-hand. The pilot acknowledged this, although their transmission was distorted. The controller asked the pilot if they could try their second radio, which was acknowledged. At 1011:25, the DA40(B) pilot reported ready for left-base and was instructed by the controller to report final, which was acknowledged. At 1011:54, the DA40(A) pilot reported downwind right-hand for a touch-and-go. The controller advised them that they were No2, and that No1 was a DA40 turning onto left-base about 2 miles to the south-east. The controller asked the DA40(A) pilot to report if they became visual (with DA40(B)), which was acknowledged (Figure 2).

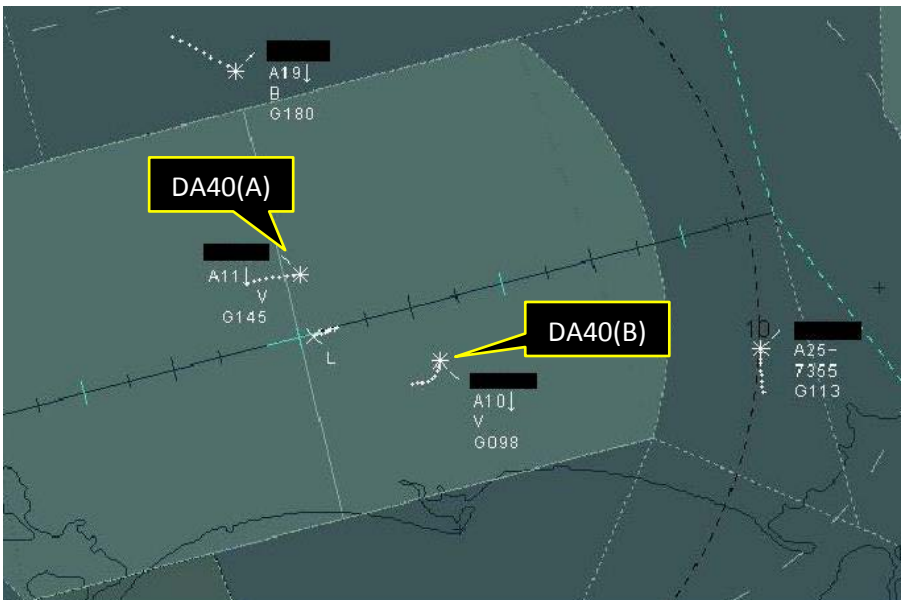

Figure 2 – 1011:54

The controller was then occupied with two groups of vehicles crossing the runway. At 1012:33, the controller advised the DA62 pilot that they were "*No3 in traffic, No2 is in your 1 o'clock at about 3 miles downwind*". They then continued the transmission without a break, calling the DA40(A) pilot and instructing them "*not too tight downwind - you're turning inbound confirm?*". The DA40(A) pilot replied "*Wilco*" (Figure 3).

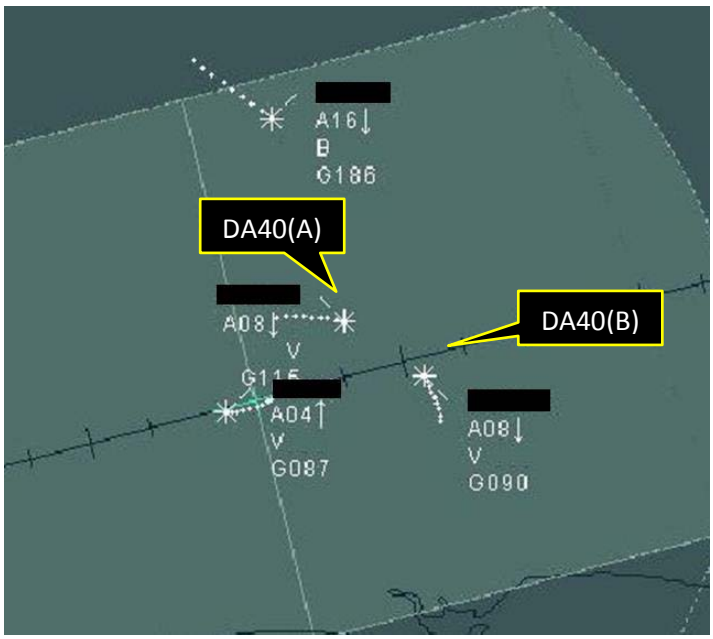

Figure 3 – 1012:33

At 1012:47, the controller instructed the DA40(A) pilot *"(incomplete abbreviated callsign) turn right, (abbreviated callsign) turn right now, you're in front of another aircraft turning onto final. You're No2 to that aircraft. Are you visual?*". The DA40(A) pilot advised "*traffic not sighted*". (Figure 4).

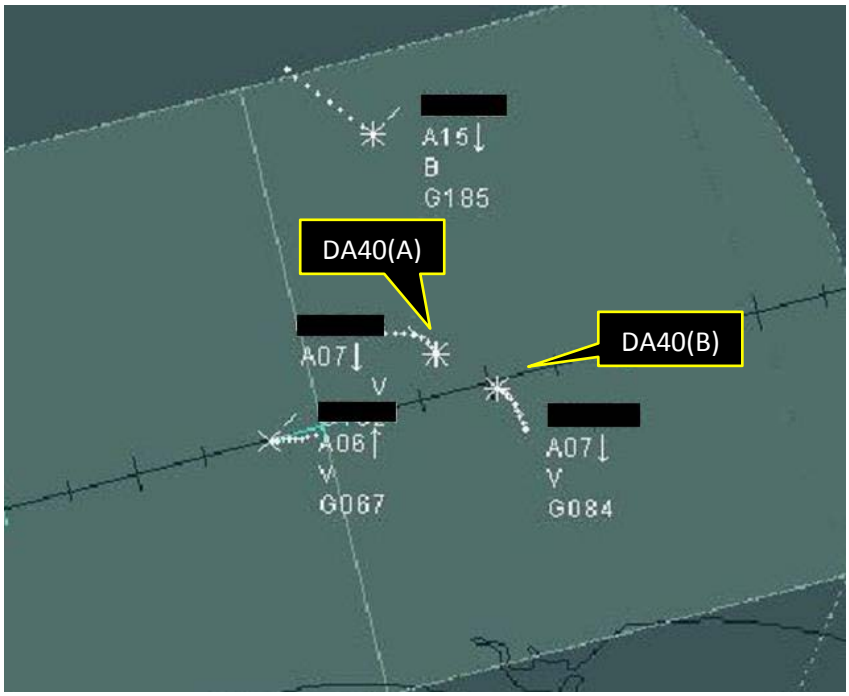

Figure 4 – 1012:47

Then, at 1012:58, the controller instructed the DA40(B) pilot *"(abbreviated callsign) er turn left immediately*" which was acknowledged. It is estimated that this was the point of CPA, with the aircraft separated by less than 0.5NM and 100ft (Figure 5).

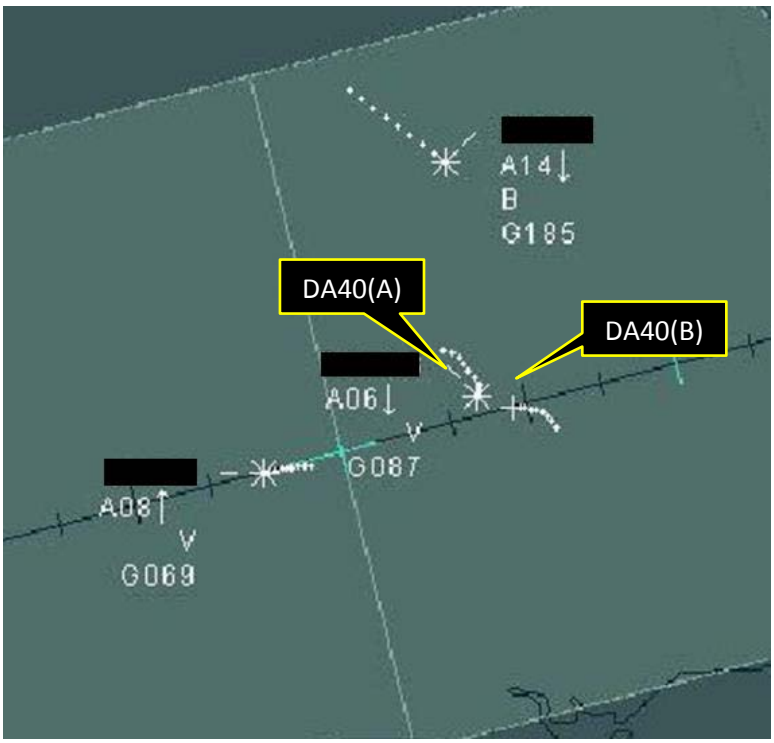

Figure 5 – 1012:58 CPA

By 1013:04, the DA40(A) could be seen to be turning to the right on the radar replay, and its pilot subsequently reported going-around (at 1013:20).

The circuit appears to have been running well, with the Tower controller fully aware of all aircraft positions and passing Traffic Information accordingly. The pilot of the DA40(A) stated that their downwind call was later than normal because they had been occupied with changing their radios due to the reported distortion. The pilot was aware of the DA62 joining from the north and heard the DA40(B) pilot call on left base. In their report they stated that, after hearing the DA40(B) pilot call on left-base, they were then instructed by the controller to report final. This was evidenced by their turn onto right-base shortly afterwards, observed on the ATM recording. When the controller started to advise the DA62 pilot joining right-base of their position in the circuit, they then apparently noticed the confliction between both DA40s and the question to the DA40(A) pilot, "*you're turning inbound, confirm?"*, may have been taken as a clearance, because in response the DA40(A) pilot responded *"Wilco".*

The controller then took positive control of the situation, issuing instructions to the pilot of the DA40(A) to resolve the confliction. The pilot of DA40(B) reported receiving a TCAS warning when on final approach, sighting DA40(A) shortly afterwards and making a turn to the left to avoid it. The DA40(A) pilot reported not being visual with DA40(B) at any time. When the DA40(A) pilot called downwind, it might have been more appropriate for the controller to have advised them that they were No2 and to *follow* the DA40(B) on left-base, rather than requesting a visual call. This would have had the benefit of giving the DA40(A) a positive instruction with which, had they been unable to comply, (i.e. not being visual with the DA40(B)), might have then prompted the pilot to say something, allowing the controller to issue further advice/instructions. As such, the turn onto right-base made by the DA40(A) pilot, ahead-of, and apparently without visual contact with, the DA40(B), led to the Airprox.

The Bournemouth ATC investigation covered the possible use of GMC and the number of aircraft allowed in the circuit, but concluded that, although both might have helped to reduce workload, it would not have prevented the Airprox due to the positioning and actions of the pilot of DA40(A) turning in ahead of the DA40(B).

The Airprox took place in Class D airspace where both aircraft were receiving an Aerodrome Control Service.

CAP493 Section 2: Chapter 1: Aerodrome Control:

2. Responsibilities
2.1 Aerodrome Control shall issue information and instructions to aircraft under its control to achieve a safe, orderly and expeditious flow of air traffic with the objective of:
(1) Preventing collisions between:
(a) aircraft flying in, and in the vicinity of, the ATZ;
(b) aircraft taking-off and landing;
(c) aircraft and vehicles, obstructions and other aircraft on the manoeuvring area.

***Note**: Aerodrome Control is not solely responsible for the prevention of collisions. Pilots and vehicle drivers must also fulfil their own responsibilities in accordance with Rules of the Air.*

UKAB Secretariat

The DA40(A) and DA40(B) 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] 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.[3]

Bournemouth ATC Occurrence Investigation

The ADI controller was operating with Tower and GMC positions band-boxed at the time of the incident. The operating hours of GMC are published in the AIP as 1000-1800L; however, staff shortages over an extensive period of time have resulted in this not being possible, therefore the position is not routinely manned. Three solo students, all from the same training establishment, were operating in the visual circuit. General practice is to allow one or two aircraft in the visual circuit so as not to overload the ADI controller who may not have the availability of a GMC controller, whilst minimising delays to other aircraft and maximising training value to the circuit aircraft. However, numbers of accepted training aircraft are decided on a daily basis according to staffing levels on any particular day. Any additional trainers are accepted at the discretion of the duty controller at the time.

DA40(A) was crosswind right-hand when the ADI controller passed traffic regarding a DA62 which was inbound from the north. The response from the student was distorted to the extent that the transmission was barely readable. The controller advised the student pilot of this and requested that he tried the other box. The pilot responded but the transmission was unreadable. Just over half a minute later he transmitted again and was informed of his number in the circuit pattern. The ADI controller was asked about their rationale for allowing three aircraft in the circuit at the same time, and whether they considered traffic levels necessitated the opening of the GMC position. The controller advised that traffic levels had been very light up to the time of the incident and that he considered traffic levels had been manageable with both ADC and GMC combined. He explained that DA40(B) had been late getting airborne into the circuit (the aircraft should have landed at 1000 at which time DA40(A) was due to get airborne). The controller reported that he allowed DA40(B) to remain in the circuit as it was quiet enough at the time.

Several vehicles were on frequency at the time of the incident; at 10:12:11, a fuel tanker received clearance to cross the runway at holding point Charlie. This transmission was immediately followed by a clearance to Fire 3 in convoy with two other fire vehicles to cross the runway at holding point Romeo. Then a response to a request from 'Tels', who were cleared to holding point Delta. Holding point Romeo is situated to the left of the controller's position in the VCR. With the exception of one aircraft in the climb-out, the other aircraft were approaching the RW26 threshold, which is positioned

[2] SERA.3205 Proximity.
[3] SERA.3225 Operation on and in the Vicinity of an Aerodrome.

to the right of the controller. The ADI controller stated that he was "pretty sure" he took his eye off the aircraft whilst observing the three fire vehicles crossing the runway from holding point Romeo.

Whilst the controller transmitted to the vehicles, DA40(A) can be seen on the radar replay to drift closer to the final approach track and towards DA40(B), which is just about to turn on to final approach from left-base at 2.25NM. The controller reported post-incident that the track of the aircraft "wasn't great" but not entirely unusual from a trainee pilot. The controller's next transmission was Traffic Information and number in the pattern to the DA62 pilot, a faster moving aircraft inbound towards right base. Whilst the controller was transmitting to this aircraft, the ATM recording depicts DA40(A) beginning to turn inbound towards final ahead of DA40(B), the aircraft he has acknowledged that he will follow. The transmission by the controller at this time was as follows:

10:12:34: (DA62 c/s) you're number three in traffic number two is in your one o'clock at about three miles downwind, (DA40(A)) not too tight downwind you're turning inbound confirm?

The investigator considers that whilst the student pilot had incorrectly turned in front of DA40(B), the controllers use of the word "*confirm*" at the end of the transmission may have been misinterpreted by the DA40(A) pilot to have been an instruction rather than a question, because the pilot's response was "*Wilco*". However the controllers immediate transmission in response was:

10:12:46: (DA40(A) C/S) turn right (C/S) turn right now turn right now you're in front of another aircraft turning on to final, you're number two to that aircraft, are you visual?

Therefore it is considered that any misinterpretation by the pilot that he was turning inbound correctly was so momentary that the impact upon the proximity of the two aircraft would not have been affected, i.e. the Airprox was going to occur anyway.

The written account by the DA40(A) pilot contained a discrepancy in that he described hearing the No1 aircraft call on left-base and shortly after being informed by ATC that he was to report on final approach. The pilot also stated in his report that he thought DA40(B) was about to turn onto the final approach so started a right turn to join right-base. The pilot was correct in his assumption that DA40(B) was about to turn on to final, but had a lack of appreciation as to where on final the aircraft was positioning. The DA40(A) pilot had flown a tighter circuit pattern to the north of the airfield than DA40(B) had to the south. Despite not being visual with the other aircraft, he assumed the aircraft must be ahead and commenced the base turn without knowing where it was and without being instructed to do so, thus turning towards a 1.5NM final in front of the other aircraft which was positioning on to final at 2NM. Consideration was also given as to whether resolving the radio issues may have caused a distraction of any relevance. The pilot mentioned in his report that he changed to his Com2 box whilst turning downwind which may have resulted in a later than normal downwind call; there was, however, no reason to believe this potential distraction played a part in the eventual Airprox.

The account outlined by the DA40(B) pilot was a largely accurate version of events. The pilot was instructed to turn left immediately to avoid the other aircraft and the pilot responded promptly. Once the traffic situation had been resolved, DA40(B)'s circuit detail was curtailed due to delays resulting from the number of aircraft having to orbit. By this time, the student was in excess of 20min beyond the time at which his circuit detail should have finished. He had been late getting airborne into the visual circuit and had been allowed to overrun his training slot.

The controller was operating with ADC and GMC band-boxed with a number of vehicles on frequency which potentially drew the controller's concentration away from the primary task of dealing with the aircraft. Had GMC been open, it would have assisted with the workload. However, it is considered that the reduction in controller workload would not have prevented the occurrence from happening. Whilst the controller did not use the phrase 'avoiding action', the instructions issued to both aircraft to resolve the confliction were spoken with urgency and both pilots responded promptly.

The investigation recommended that the DA40 training company is reminded of the importance of complying with the times of training bookings and that instructors and trainee pilots should be reminded of the importance of complying with the times for which they have booked training. This will assist in regulating traffic levels.

Summary

An Airprox was reported when DA40(A) and DA40(B) flew into proximity in the Bournemouth visual circuit at 1012hrs on Thursday 5th December 2019. Both pilots were operating under VFR in VMC, both pilots were in receipt of an Aerodrome Control Service from Bournemouth Tower.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from the pilots of both aircraft, transcripts of the relevant RT frequencies, radar photographs/video recordings, reports from the air traffic controllers involved and reports from the appropriate ATC and operating authorities. Relevant 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. Although not all Board members were present for the entirety of the meeting and, as a result, the usual wide-ranging discussions involving all Board members were more limited, sufficient engagement was achieved to enable a formal assessment to be agreed along with the following associated comments.

The Board first looked at the actions of the DA40(A) pilot. He was a low-hours solo-student and they noted that he had a lot to contend with in assimilating the traffic in the busy circuit and with his radio problems. When his downwind track converged onto the base-leg (**CF6**), it caused the controller some concern. However, members agreed that the phraseology used by the controller when questioning whether the pilot was turning onto base-leg had been ambiguous and had probably been misunderstood to be an instruction. Nevertheless, they felt that the student pilot should have questioned what he thought to be an instruction, knowing that he wasn't visual with the one ahead which he knew he had to position behind (**CF7**, **CF8**). There followed a discussion about the issues around teaching students when it was acceptable to question an ATC instruction, or to ask for additional information, and members noted that this was often down to guidance and supervision from instructors, although they stopped short of making this a contributory factor in this case. The DA40(A) pilot had been told by ATC that he was No2 to the DA40 in the left-hand circuit and it had been his responsibility to ensure he adhered to the circuit order and that he was visual with it before he turned onto base-leg, whether or not he believed the controller had told him to turn inbound (**CF4**, **CF5**, **CF9**). Once he had turned onto base-leg, the controller gave him an instruction to turn away, which he followed, and so he had not seen the DA40(B) (**CF11**).

The Board then briefly discussed the actions of DA40(B) pilot. He had been in the left-hand circuit and had been told he was No1; once he had turned onto base-leg he had received a TAS alert and had become visual with the DA40(A) (**CF10**). He had received instructions from ATC to turn away from the DA40(A) and had not been overly concerned by the incident.

Turning to the Bournemouth ADI controller, members noted that he had been operating with the ADI and GMC positions band-boxed, which meant that he had to deal with all ground movements, including a number of vehicles requiring clearances to cross the runway, and they considered that his had undoubtedly been a distraction to him (**CF1**, **CF3**). They noted that it was common for units to operate with circuits in opposite directions, but that it did require controllers and pilots to maintain awareness of all circuit users. That said, the controller had noticed that the DA40(A) pilot's track was converging towards the base-leg. Unfortunately, the phraseology that he had used to alert the pilot had been ambiguous and the Board thought that if he had been clearer, the student pilot might not have turned. Controller members of the Board noted that, had the controller included Traffic Information on the

position of the DA40(B) at this point, the DA40(A) pilot may have realised that it hadn't been an instruction to turn in, and anyway it may have enabled the pilot to become visual (**CF2**). It was obvious to Board members that the controller had not intended for the DA40(A) pilot to turn at that point and, once he had realised what was happening, he had quickly told the pilot to turn right, away from the other aircraft. Members briefly commented that if he had used the terminology 'avoiding action' it may have ensured the pilot was under no illusion as to the nature of the turn, but in the event the pilot had taken the turn anyway.

Finally, in determining the risk, it was quickly agreed that the DA40(B) pilot was visual with DA40(A), and the controller had given swift instructions to turn both aircraft away. Therefore, although safety had been degraded, there had been no risk of collision; Risk Category C.

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

Contributory Factors:

	2019330		
CF	**Factor**	**Description**	**Amplification**
	Ground Elements		
	• Manning and Equipment		
1	Organisational	• ATM Staffing and Scheduling	Sub-Optimal establishment or scheduling of staff
	• Situational Awareness and Action		
2	Human Factors	• Traffic Management Information Provision	Not provided, inaccurate, inadequate, or late
3	Human Factors	• Distraction - Job Related	
	Flight Elements		
	• Regulations, Processes, Procedures and Compliance		
4	Human Factors	• Flight Crew ATM Procedure Deviation	Regulations/procedures not complied with
	• Tactical Planning and Execution		
5	Human Factors	• Action Performed Incorrectly	Incorrect or ineffective execution
6	Human Factors	• Aircraft Navigation	Did not avoid/conform with the pattern of traffic already formed
	• Situational Awareness of the Conflicting Aircraft and Action		
7	Human Factors	• Understanding/Comprehension	Pilot did not assimilate conflict information
8	Human Factors	• Lack of Communication	Pilot did not request additional information
9	Human Factors	• Monitoring of Other Aircraft	Pilot did not sufficiently integrate with the other aircraft
	• Electronic Warning System Operation and Compliance		
10	Contextual	• ACAS/TCAS TA	TCAS TA / CWS indication
	• See and Avoid		
11	Human Factors	• Monitoring of Other Aircraft	Non-sighting or effectively a non-sighting by one or both pilots

Degree of Risk: C.

Safety Barrier Assessment[4]

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

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

Ground Elements:

Manning and Equipment were assessed as **partially effective** because the ADI and GMC positions were band-boxed and the vehicular movements were a distraction for the controller.

Situational Awareness of the Confliction and Action were assessed as **partially effective** because the phraseology used by the controller led the student to believe he was being told to turn inbound.

Flight Elements:

Regulations, Processes, Procedures and Compliance were assessed as **partially effective** because DA40(A) pilot was told he was No2, but turned onto base-leg without being visual with the aircraft ahead.

Tactical Planning and Execution was assessed as **partially effective** because the DA40(A) pilot flew a downwind leg that was converging onto the approach, leading the controller to believe he was already turning onto base-leg.

Situational Awareness of the Conflicting Aircraft and Action were assessed as **partially effective** because the DA40(A) pilot misunderstood the instruction given by the controller and turned onto base-leg without being visual with DA40(B) that he had been told was ahead.