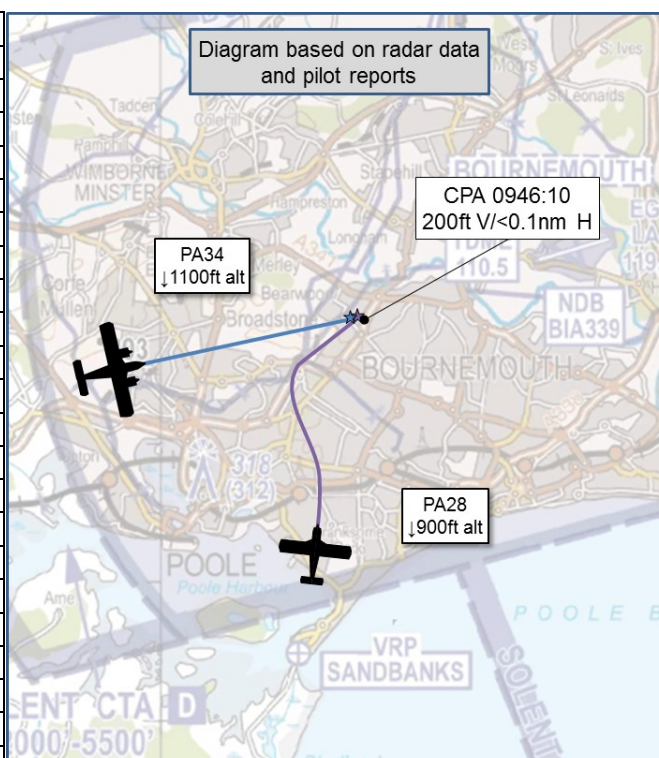


AIRPROX REPORT No 2019121

Date: 23 May 2019 Time: 0946Z Position: 5045N 00154W Location: Bournemouth CTR

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	PA34	PA28
Operator	Civ FW	Civ FW
Airspace	Bournemouth CTR	Bournemouth CTR
Class	D	D
Rules	IFR	VFR
Service	ACS	ACS
Provider	Bournemouth	Bournemouth
Altitude/FL	1100ft	900ft
Transponder	A, C, S	A, C
Reported		
Colours	White, Blue	White, Blue
Lighting	Strobe	Strobe, Beacon
Conditions	VMC	VMC
Visibility	10km	>10km
Altitude/FL	1500ft	1200ft
Altimeter	QNH (1016hPa)	QNH (1016hPa)
Heading	080°	335°
Speed	100kt	75kt
ACAS/TAS	TAS	Not fitted
Alert	None	N/A
Separation		
Reported	300ft V/20-30m H	Not seen
Recorded	200ft V/<0.1nm H	



THE BOURNEMOUTH CONTROLLER reports that whilst operating with a trainee in CAVOK conditions, a PA34 pilot on an NDB approach to RW08 was cleared for a touch and go. Previously, a PA28 pilot inbound from Sandbanks VRP was instructed to position No2 to the PA34. The PA28 was observed to turn left to widen out behind the PA34. However, the PA28 then appeared to turn towards the PA34. The PA28 pilot was asked if he had the PA34 in sight but replied no, so was warned the traffic was due north and to 'turn away now to the south'. The PA34 pilot also went around. The pilot of the PA28 later apologised, he thought the PA34 was closer to the runway than it was.

THE PA34 PILOT reports that they were at about 4nm on the final approach and had been cleared for the approach by ATC for the NDB/DME RW08. The student pilot was flying 'under the hood' and they had an observing student pilot in the cabin. At about 1200ft, the rear-seat observer instructed 'Go-around' which they did. At no time did the instructor or the flying student see the other aircraft prior to the incident but the rear-seat student estimates that they came to within 20-40m and 300ft vertical separation. There was no warning from the TAS nor from ATC in the aircraft.

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

THE PA28 PILOT reports that he entered the CTR at Sandbanks VRP. He was instructed to position No2 behind the PA34 on an IFR approach to RW08 at about 7nm. He did not acquire visual contact with the PA34 although he expected to do so. About halfway between the Sandbanks VRP and the RW08 threshold he turned left onto a heading of 335°, a slightly divergent base-leg heading, expecting the PA34 to pass in front of him from left-to-right. He was unable to request an update of the PA34's range due to the near-continuous radio transmissions. He was concentrating his lookout mainly to his left. Without obtaining visual contact with the PA34 he assumed, incorrectly, that the PA34 had passed ahead and he looked to the right. Close to his final approach course, he was instructed by Bournemouth Tower to 'Turn right now', which he immediately complied with. The PA34 had received a TCAS RA [he

believed] and a collision was avoided. He was unable to request an orbit or other significant manoeuvre due to the R/T saturation, he assumes that ATC did not instruct him to carry out an orbit, as they frequently do to avoid conflicts, for the same reason. When ATC use the Ground frequency it considerably eases the frequency congestion on the Tower frequency, but during this time this was not the case. The PA28 he was flying does not have Mode S equipment which, he believes, would enhance its conspicuity and ease identification for ATC. He did not file an MOR because he did not see the PA34 and therefore cannot comment on the proximity. He noted that over the last 2 years the volume of traffic at Bournemouth has increased significantly which, in his opinion, contributes to considerable pressure on pilots and ATC to maintain a safe flow of traffic.

Factual Background

The weather at Bournemouth was recorded as follows:

METAR EGGH 230920Z 13005KT 080V160 CAVOK 18/08 Q1016

Analysis and Investigation

UKAB Secretariat

The PA34 and PA28 pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard¹. 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 operation².

Bournemouth ATC Occurrence Investigation

This incident has been upgraded to an Airprox report following discussions and review of the RT and Radar tapes between the controller and the UA. The investigator has reviewed the RT and Radar tapes and discussed the incident with the controllers involved and listened to the telephone calls with both pilots involved. The investigator has also spoken with the Safety Officer from the PA34's Operating Authority and both pilots involved in the incident. The controllers were operating as combined Tower and Ground with an experienced controller being monitored by an OJTI during training for a revalidation in the Bournemouth Tower position. They had been in the seat for approximately 37 mins and the weather was CAVOK with good visibility in all directions. At the time of the incident Bournemouth was operating on RW08 with instrument and visual traffic.

At 09:41:01, the Bournemouth Radar controller advised the trainee tower controller of the PA28 inbound on a pink strip, used to denote a local sortie to and from Bournemouth, inbound from the Sandbanks area to the south west. This was acknowledged by the Tower controller and the PA28 can be seen on the radar recording squawking 7377 as it approaches the Sandbanks area.

At 09:42, the PA34 pilot contacts Bournemouth Tower controller, established on the ILS for RW08 reporting at 8nm [UKAB note: The PA34 was on an NDB/DME approach, the 'established on the ILS' report by the PA34 pilot is believed to be a slip by the student pilot]. The PA34 pilot is told to continue the approach which is acknowledged. There are various calls from the Tower Controller to aircraft taxiing, and calls via landline to radar advising of a VFR departure and vehicles.

At 09:44:16 (Figure 1), the PA28 pilot contacts Bournemouth Tower, joining from the SW at Sandbanks and is advised by Bournemouth Tower to report final and that they are No2 to a PA34 on 5-mile final. This is acknowledged by the PA28 pilot but, when the investigator reviewed the radar recording, the position of the Seneca was closer to 6nm than 5nm on the final approach track.

¹ SERA.3205 Proximity.

² SERA.3225 Operation on and in the Vicinity of an Aerodrome.



Figure 1: 0944:16

Initial contact from the PA28 to the SSW with the PA34 on final approach track

There are various calls from the Bournemouth Tower controller to taxiing aircraft and vehicles, and at this time both the OJTI and the trainee reported that the flight strip for an aircraft taxiing out did not reflect what the aircraft wanted to do so they became involved with trying to establish the aircraft's actual intentions (the details of the departure had been taken by a trainee on the back desk and entered incorrectly into the FPS which caused both controllers to become distracted from the aircraft in the circuit whilst they attempted to confirm the correct flight plan details). This was protracted because by then, the assistant on the back desk had changed and was not the one who had taken the details.

At 09:45:20 the Bournemouth Tower controller issues clearance to the PA34 pilot for a touch and go RW08 which is acknowledged. At this point the PA28 is to the SE of the PA34 at 1200ft indicated, and approximately 1.5nm separation (Figure 2).



Figure 2: 0945:20

From the RT tapes the investigator could hear a number of calls for aircraft taxiing with give way instructions, and vehicles looking to transit across the runway and on the northside of the airfield. As the Bournemouth Tower controller calls Solent Radar they spot the confliction with the PA34 and the PA28 on the ATM and ask the PA28 pilot if he is visual with the Seneca to which he responds 'No'. The Bournemouth Tower controller advises the PA28 pilot that they believe him to be just south of the PA34 and advise the PA28 pilot to turn south immediately, very shortly after the PA34 pilot reports going around.

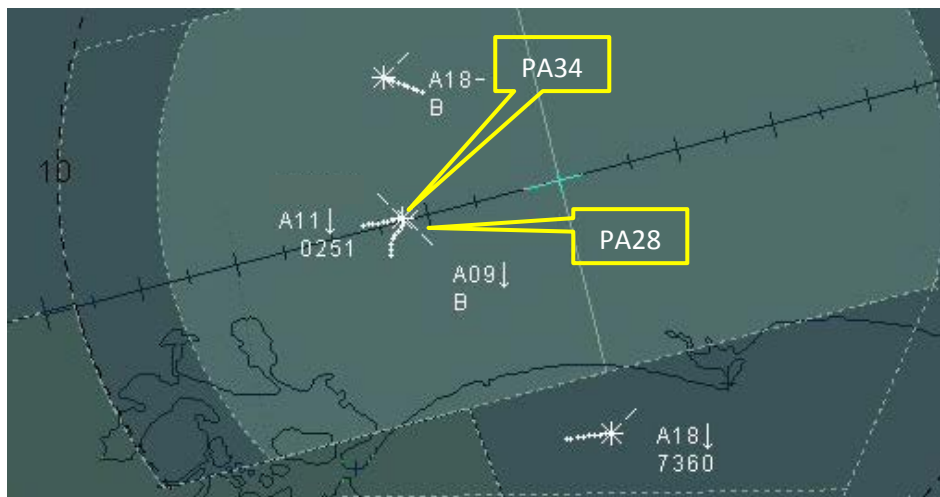


Figure 3: 0946:10

PA28 pilot instructed to turn south by Tower and PA34 pilot reports going around.

From the radar replay tapes the investigator estimates that the aircraft came within 200ft and less than 0.5nm of each other at 09:46:10 (Figure 3).

The controllers involved were relieved from the position shortly after the incident and the OJTI contacted the pilot of the PA28 via the recorded line at 10:13Z. During the phone call the pilot of the PA28 advised the Bournemouth Tower OJTI that he had not been visual with the PA34 and estimated the position of the PA34 incorrectly. In a subsequent conversation with the investigator the pilot advised that due to the courses both aircraft were tracking, he believes this angle of the converging heading may have been a factor in them not seeing the PA34. In hindsight, he advised that he should have turned away or orbited to try to gain visual contact rather than continuing towards final. At the time of the incident the aircraft did not have any form of TCAS or warning system or Mode S fitted, although it did have Mode A and C which were both functioning. Since the event the pilot has advised that the aircraft is now fitted with 'Flight Aware' ADS-B, although this provides limited benefits as it does not pick up the CTS aircraft in the circuit. The pilot also advised that they have invested in Mode S which should be fitted to the aircraft soon.

The OJTI also spoke with the instructor of the PA34 when it landed back at Oxford to determine what had happened from their point of view. The instructor advised that he and the trainee pilot had been operating IFR, with the trainee pilot operating with restricted view due to the hood and a passenger in the rear seat as an additional pair of eyes. Neither the instructor nor the left-hand seat trainee saw the PA28, but the passenger in the rear observed the aircraft and called to the front-seat pilot to go-around explaining the proximity of the PA28. This was initiated by the instructor and the aircraft climbed away from the conflict. At no point did the instructor see the PA28 and he was also extremely concerned that the TCAS fitted to the aircraft had given no warning of the proximity of the PA28, which he would have expected. The Bournemouth OJTI confirmed that the PA28 had been transponding and this was again confirmed by the investigator when they spoke with the PA34 instructor. During the conversation between the Oxford Instructor and the Bournemouth OJTI, the Oxford instructor stated that they received no TCAS warning and did not see how close the PA28 was. They decided that a report would be filed but they did not believe it to be an Airprox at that time. The subsequent review of the RT and Radar tapes by the OJTI and the UA showed how close the aircraft were to each other and it was decided by the controller that the incident needed to be upgraded to an Airprox.

The Bournemouth MATS Pt 2 states that: *The Ground Movement Control position is established for the period 10:00-18:00L daily and normal operations should be with GMC in operation throughout this notified period.* However, having spoken with the OJTI at length, they confirm that the number of vehicles and aircraft on frequency did not constitute the requirement for GMC to be open, the distraction of the FPS was the primary reason for the late sighting of the incident by both the OJTI and the trainee.

The following conclusions have been reached:

1. The PA28 pilot positioned on final without being visual within the No1 traffic and came within 200ft vertically and within approximately 300ft horizontally of the PA34.
2. The Tower instructor and trainee were distracted by incorrect Flight details for a taxiing aircraft and spotted the confliction late
3. A trainee entered incorrect details into an FPS which caused confusion to the controllers.

Comments

PA34 Operating Authority Comment

The PA34 was operating under IFR, in Class D airspace conducting an instrument approach. The crew's recollection is that the other aircraft, a PA28, had been cleared as "No2 to a Seneca". No Traffic Information was passed which might have indicated the other aircraft's proximity. The PA34 is fitted with a Traffic Advisory System (TAS) which should detect any MODE A, C or S active transponder. The TAS was tested and functioning correctly prior to flight, but no indication or warning was issued during the incident. Neither the instructor nor the front-seat student, who was wearing an instrument hood, sighted the other aircraft visually. It was only sighted by the rear-seat student pilot who was acting as an observer and called on intercom for the aircraft to climb and go-around. Considering the barriers which remained between this Airprox and a mid-air collision, it appears that, in the absence of the rear-seat observer's sighting, only a visual sighting by the other aircraft or mere providence would have prevented a much closer encounter or collision. The UKAB will no doubt have information on whether the other pilot had visual contact but, from the relative geometry, it seems unlikely. We therefore conclude that there was a high risk of collision and we were fortunate that the outcome of this occurrence was not more serious. The actions of the rear-seat observer, a student pilot were, we believe, on this occasion commendable.

Summary

An Airprox was reported when a PA34 and a PA28 flew into proximity in the Bournemouth CTR at 0946hrs on Thursday the 23rd of May 2019. The PA34 pilot was operating under IFR in VMC and the PA28 pilot was 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 both pilots, radar photographs/video recordings and reports from the air traffic controller involved. 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.

The Board began by looking at the actions of the PA34 crew. They commended the observing student for maintaining a robust lookout and reacting in time to tell the front-seat crew to 'Go-around', which they did; this had undoubtedly prevented a greater risk of collision (**CF13**). The Board wondered why the TAS had not alerted the crew to the conflict given that the PA28 was squawking, and some members opined that this may have been a result of aerial blanking. However, without knowing the aircraft fit and relative geometries in detail, this was merely conjecture (**CF11**). What it did highlight though was that, even under seemingly benign conditions, electronic conspicuity and collision warning systems were not infallible, and this in turn highlighted the importance of robust lookout.

The Board then turned to the actions of the PA28 pilot. He had been informed he was No2 to the PA34 on the approach by the Bournemouth controller but members noted that he had continued inbound without gaining visual with it; as a result, he was therefore unable to integrate into the pattern of traffic formed by the PA34 (**CF7**). Members noted that he had commented that he couldn't ask for an update on the PA34's range when he didn't gain visual contact because of the almost continuous radio transmissions (**CF8**). He had also commented that he couldn't ask for an orbit for the same reason.

Whilst the levels of RT traffic were unfortunate, the Board agreed that it remained his responsibility to integrate, and if he could not ensure he could do so because he was not visual with the PA34 then he should not have proceeded onto the final approach; the Board did not have access to relevant airfield procedures, but members felt that although not able to ask for an orbit, he should either have turned away independently (as an emergency procedure) or maintained sufficient height above the final approach path as he approached such that he could then fly through the pattern deadside and join the circuit in a different fashion once he had all the other aircraft in sight (**CF5, 6, 9 & 10**). Members noted that at no stage did the PA28 pilot gain visual contact with the PA34 (**CF12**), and so he had been unable to play any part in resolving the ensuing conflict.

Lastly the Board looked at the actions of the Bournemouth controllers. They were bandboxed with ADC and GMC and, although this was normal practice at the time of the Airprox, members agreed that the inaccurate Flight Progress Strip (FPS) and the distraction that that created had served to draw the controllers' attention away from their primary role of ensuring the safe and efficient flow of aircraft in the circuit (**CF1 & 4**). In this respect, controller members opined that in their opinion the OJTI would have been better served by taking over the controlling element and directing the trainee to resolve the admin tasks (**CF2**). By both becoming absorbed in the FPS issue, neither identified the unfolding confliction until later than desirable. Although they were able to issue last-minute avoiding action to the PA28 pilot, this was too late, and the PA34 crew had already initiated their own emergency avoiding action (**CF3**).

Turning to the risk, members quickly agreed that safety margins had been much reduced below the norm, and it had only been the PA34 crew's emergency actions that had increased the aircraft separation. Accordingly, they assessed the risk as Category B.

PART C: ASSESSMENT OF CAUSE AND RISK

Contributory Factors:

2019121			
CF	Factor	Description	Amplification
Ground Elements			
• Manning and Equipment			
1	Organisational	• ATM Staffing and Scheduling	Sub-Optimal establishment or scheduling of staff
2	Human Factors	• Mentoring	Sub-Optimal
• Situational Awareness and Action			
3	Human Factors	• Conflict Detection - Detected Late	
4	Human Factors	• Distraction - Job Related	
Flight Elements			
• Regulations, Processes, Procedures and Compliance			
5	Human Factors	• Flight Crew ATM Procedure Deviation	Regulations/procedures not complied with
• Tactical Planning and Execution			
6	Human Factors	• Insufficient Decision/Plan	Inadequate plan adaption
7	Human Factors	• Action Performed Incorrectly	Did not follow instructions
• Situational Awareness of the Conflicting Aircraft and Action			
8	Human Factors	• Lack of Communication	Pilot did not request additional information
9	Human Factors	• Lack of Action	Pilot flew into conflict despite Situational Awareness
10	Human Factors	• Monitoring of Other Aircraft	Pilot did not sufficiently integrate with the other aircraft
• Electronic Warning System Operation and Compliance			
11	Technical	• ACAS/TCAS System Failure	CWS did not alert as expected
• See and Avoid			
12	Human Factors	• Monitoring of Other Aircraft	Non-sighting or effectively a non-sighting by one or both pilots
13	Human Factors	• Monitoring of Other Aircraft	Late-sighting by one or both pilots

Degree of Risk: B.

Safety Barrier Assessment³

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 Bournemouth was operating with ADC and GMC bandboxed which increased the workload of the controller, this was exacerbated due to the incorrect details on the FPS.

Situational Awareness of the Confliction and Action were assessed as **partially effective** because the confliction was resolved later than desirable due to the FPS distraction.

Flight Elements:

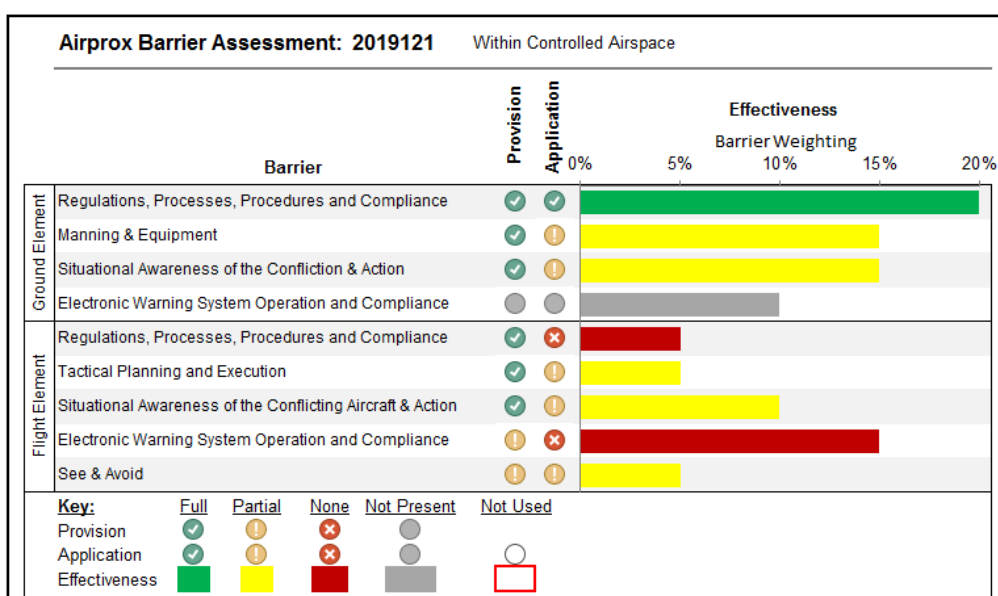
Regulations, Processes, Procedures and Compliance were assessed as **ineffective** because the PA28 pilot didn't integrate with the PA34 in the pattern of traffic.

Tactical Planning and Execution was assessed as **partially effective** because although he turned left initially when he became aware he was likely to conflict with the PA34, the PA28 pilot didn't effectively adapt his plan when he did not gain visual acquisition with it.

Situational Awareness of the Conflicting Aircraft and Action were assessed as **partially effective** because the PA28 did not effectively use the situational awareness he had that the PA34 was on the approach to sequence himself behind.

Electronic Warning System Operation and Compliance were assessed as **ineffective** because the PA34's TAS did not alert the pilot to the presence of the PA28 in confliction.

See and Avoid were assessed as **partially effective** because although the PA28 pilot did not see the PA34, the PA34 pilot was alerted later than desirable to the presence of the PA28 by a student pilot in the back-seat and was therefore able to carry out emergency avoiding action.



³ The UK Airprox Board scheme for assessing the Availability, Functionality and Effectiveness of safety barriers can be found on the [UKAB Website](#).