AIRPROX REPORT No 2022102

Date: 12 Jun 2022 Time: 1451Z Position: 5249N 00143W Location: Tatenhill ATZ

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	DR400	PA28
Operator	Civ FW	Civ FW
Airspace	Tatenhill ATZ	Tatenhill ATZ
Class	G	G
Rules	VFR	VFR
Service	AGCS	AGCS
Provider	Tatenhill Radio	Tatenhill Radio
Altitude/FL	900ft	NK
Transponder	A, C, S	A, S[1]
Reported		
Colours	White, red	White, blue
Lighting	Nav, Strobes, Landing	Nav, Beacon, Landing
Conditions	VMC	VMC
Visibility	>10km	>10km
Altitude/FL	700ft	700ft
Altimeter	QFE (1009hPa)	QFE
Heading	260°	287°
Speed	70kt	75kt
ACAS/TAS	PilotAware	PilotAware
Alert	None	Information
Separation at CPA		
Reported	0ft V/100m H	50ft V/30m H
Recorded	NK V/<0.1NM H	

THE DR400 PILOT reports that they were aware of a C172 joining ahead and made a radio call as they commenced a dead-side descent with [the C172] in front. They followed [the C172] downwind, and made a late downwind call due to other radio chatter. [A PA28] also made a downwind call and stated that they were in contact with [DR400 C/S] ahead. [The C172] made quite a wide circuit, which [the DR400 pilot] conformed to. The downwind leg was extended slightly to allow greater separation with [the C172] in front as they knew that they would be faster on final. On base leg, another aircraft passed in front of [the DR400] from left-to-right at the same level. At this stage, they were unaware that it was [the PA28] behind that was cutting in. Upon reaching the turning point from base-leg to final, [the PA28] was still flying away off their right-wing. [The DR400 pilot] turned on to final. [The DR400 pilot] then noticed [the PA28] turning left and, having overshot the runway centre, was flying on a converging course with [the DR400] to re-establish itself on final for RW26. During this turn, the pilot of [the PA28] called "final" on the radio. At this point, urgent avoidance action was necessary to prevent a collision. [The DR400 pilot] was uncertain whether there was another aircraft on downwind, so concluded that turning left was not a safe option. [The PA28] was quickly closing from the right. [The DR400] pilot considered that the only option would have been a rapid change of altitude but instead, made a radio call and stated that another aircraft had just cut in front and asked the other aircraft to turn. [The PA28] pilot responded immediately and turned [to the right]. [The DR400 pilot] estimates that without action, a collision would have occurred in less than 10sec. The remainder of the approach and landing was uneventful.

[The DR400] was equipped with [EC device] and the other aircraft did not show or generate any alerts. They considered that the risk of collision would have been reduced if the pilot of the other aircraft was

[1] Pilot reported Mode C, but not seen on radar.

using the transponder and that they had conformed to the circuit pattern, particularly as they had made a radio call stating their intention to do so.

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

THE PA28 PILOT reports that, as they were unfamiliar with [the destination airfield], they had made contact before departure to obtain PPR and to confirm the expected joining procedure. On joining [destination airfield], they noticed an aircraft on a converging course also joining. They noted the [DR400] callsign on the radio and with reference to [EC device], determined that this was most likely the aircraft they were visual with. Because they had not visited this airfield before, they decided to slow down and modify their track to follow the joining traffic. They followed this aircraft during the deadside descent, and crosswind, and continued downwind, still visual with and following an aircraft. [The PA28 pilot] extended the downwind leg to maintain separation. Whilst flying downwind, they noticed another aircraft at about 30° to their right but disregarded it as it appeared to be outside the ATZ. Towards the end of their turn from base-leg to final, the [DR400 pilot] called on the radio claiming to have been cut up and yelling for [the PA28 pilot] to take avoiding action.

During a post-flight review of the [EC device], the [PA28 pilot] opined that they believed the [DR400 pilot] may have left the ATZ during their downwind leg and then they [PA28 pilot] incorrectly assumed that they were still following the [C172], making them No2 in the circuit, with [the DR400] now becoming No3 albeit being outside the ATZ. They accept that some details of their report may be incorrect from their recall of events.

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

Factual Background

The weather at East Midlands was recorded as follows:

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METAR EGNX 121450Z 28013KT CAVOK 18/05 Q1022=
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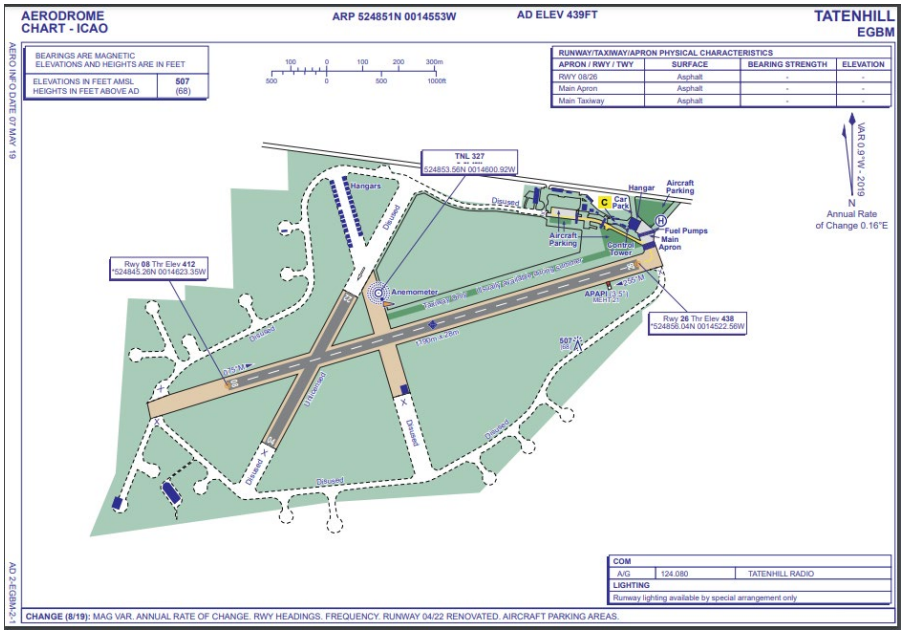
The UK AIP entry for Tatenhill is reproduced below:

EGBM AD 2.22 FLIGHT PROCEDURES

1 CIRCUITS

a. Aircraft to make standard overhead join. Circuits are left hand for Runways 08 and 26.



Analysis and Investigation

UKAB Secretariat

An analysis of the NATS radar replay was undertaken and the three aircraft mentioned in the pilots' reports could be positively identified within the Tatenhill ATZ. A C172 was No1 in the circuit, the following DR400 flew an extended crosswind leg and turned downwind wider than the circuit flown by the C172, see Figure 1.

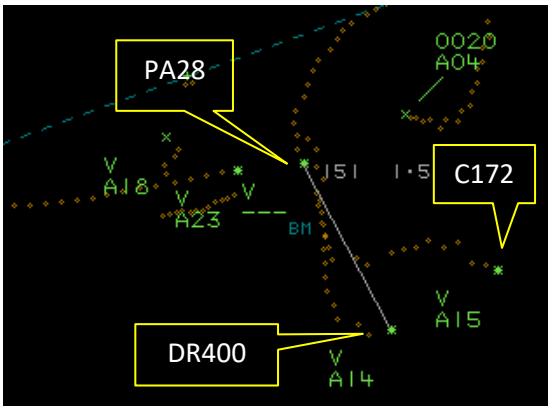


Figure 1 - 1448:51

Throughout the incident the Mode C on the PA28 could not be seen on the radar. The PA28 had joined the circuit via the overhead, and then flew a circuit inside that flown by the DR400 pilot. The C172 turned for base-leg and the DR400 extended the downwind leg, now to the right of the PA28, see Figure 2.

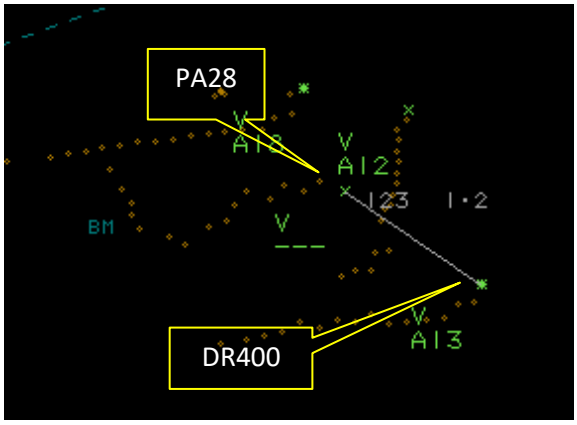


Figure 2 - 1449:58

As the DR400 turned for base-leg the PA28 crossed approximately 0.1NM ahead as it extended the downwind leg (Figure 3).

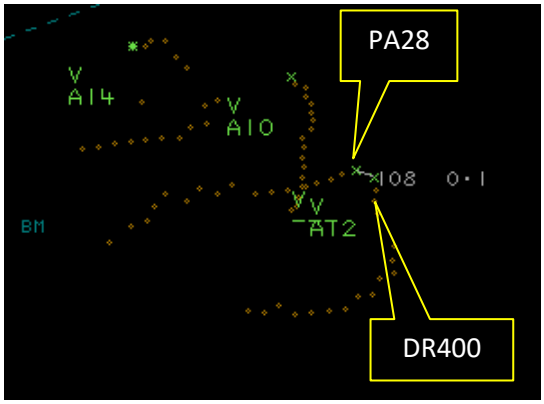


Figure 3 - 1450:23

The PA28 then turned onto base-leg, parallel and to the right of the DR400, see Figure 4.

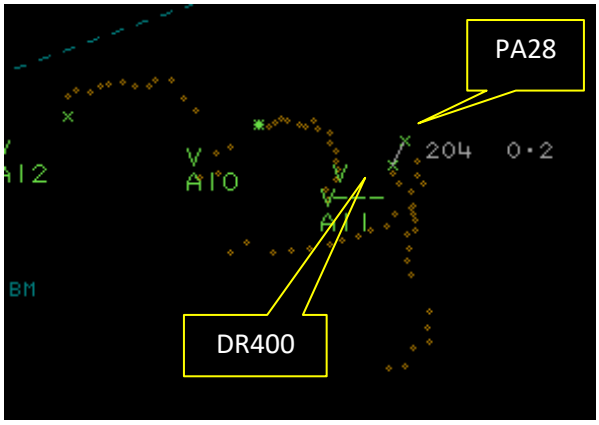


Figure 4 - 1450:50

CPA occurred when the DR400 turned final and the PA28 also made a left turn onto final (see Figures 5 and 6), the aircraft closed to less than 0.1NM horizontally, but because the altitude of the PA28 was not known, the vertical separation could not be determined.

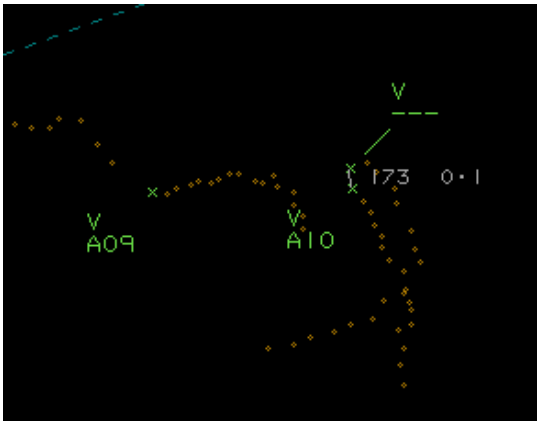


Figure 5 - 1451:07

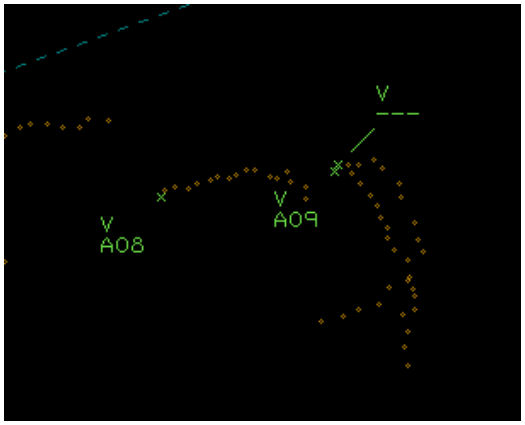


Figure 6 - CPA1451:14

The DR400 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 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]

Summary

An Airprox was reported when a DR400 and a PA28 flew into proximity at Tatenhill at 1451Z on Sunday 12th June 2022. Both pilots were operating under VFR in VMC, and both pilots were in receipt of an Air Ground Communication Service from Tatenhill Radio.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from both pilots and radar photographs/video recordings. 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 first looked at the actions of the DR400 pilot. They had been established in the visual circuit but had felt that they needed to fly a wider than normal circuit in order to fit in behind the C172. Members noted that whilst this was understandable, they cautioned pilots about flying ever wider and extended

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

circuits because, as happened here, it often led to other pilots not realising the circuit had extended and cutting in front, and noted that sometimes it was better to make an early decision to go-around instead. Whilst the DR400 pilot would have had generic situational awareness from the RT that the PA28 was in the visual circuit behind them, they had not been aware that it had flown a tighter circuit and had caught them up (**CF4**). Although it would have been expected that the EC on the DR400 would have alerted, no such alert was reported (**CF7**). The DR400 pilot had not been visual with the PA28 as it had approached from the right until it had crossed ahead and members thought that this Airprox emphasised the importance of focused look-out when in the visual circuit. Once the PA28 had cut ahead of the DR400 on base-leg, the two aircraft paralleled one another and some members wondered whether the DR400 pilot should have maintained visual contact with the PA28 at this point, rather than assuming the PA28 pilot was leaving the circuit, because then they may have realised that the PA28 was also on a base-leg. However, once they had discounted the PA28 as a factor in the circuit, the DR400 pilot had not become visual again until they were on final and had seen the PA28 turning towards them (**CF8**). Although the pilot described a position where they believed that they could not have turned left, still members thought that, given the close proximity of the two aircraft, it would have been better for the DR400 pilot to have taken positive action themselves, rather than calling out on the RT for the other pilot to turn away, if only to ensure that swift and effective action was taken, rather than relying on another pilot to react in the correct manner to increase the separation (**CF9**).

Turning to the PA28 pilot, they had joined the circuit through the overhead and members thought that the pilot should have used the join to properly identify the position of the circuit traffic whilst still in the overhead. Noting that they had recently seen a number of Airprox caused by incorrect overhead joins, members wanted to take the opportunity to highlight to pilots that the purpose of the overhead join was to allow a pilot to properly take stock of the visual circuit and identify the position of the circuit traffic without being in conflict with it, rather than just a place to descend through to reach the downwind position. Members briefly discussed whether the overhead join was being taught properly and what guidance was available to pilots and noted that the Skyway Code provided a diagram of the overhead join and clearly stated 'maintain 2000ft above aerodrome height … and observe windsock and traffic'.[4] In this case the PA28 pilot had performed the overhead join incorrectly (**CF1**) in that they had not identified the position of the traffic before descending to circuit height (**CF2**). The pilot reported that they had seen the DR400 on their EC device (**CF6**), but had incorrectly associated it with the C172 that they had been visual with ahead in the circuit. This mis-interpretation of the EC equipment (**CF5**, **CF7**) meant that the PA28 pilot had had an incorrect mental model of the circuit traffic (**CF4**), and they had subsequently discounted the DR400 as being outside the circuit and had positioned themselves as No2 behind the C172 (**CF3**). Once downwind, the pilot had had no idea that they had not been conforming with the pattern of traffic formed by the DR400, and had crossed ahead of it at the end of the downwind leg, just as the DR400 had turned onto base-leg. Still not visual with the DR400, which was now behind them, the PA28 pilot had continued the base-leg and had eventually turned onto final and into confliction. Only when the DR400 pilot had alerted them over the frequency had the PA28 pilot become visual and turned away (**CF8**).

When determining the risk of the Airprox members considered the reports of both pilots together with the radar replay. Unfortunately, because the PA28 was not displaying Mode C height information, the vertical separation was not known. However, both pilots described a situation where neither had seen the other until a late stage and the horizontal separation on the radar indicated that they were in close proximity. Therefore, members agreed that there had been a risk of collision (**CF10**), however, they discounted the highest risk category because the DR400 pilot had had the time to react by calling on the radio, rather than needing to take immediate avoiding action themselves. Risk Category B; safety not assured.

[4] Skyway Code, Aerodrome Operations, page 103 available here

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

Contributory Factors:

	2022102			
CF	**Factor**	**Description**	**ECCAIRS Amplification**	**UKAB Amplification**
	Flight Elements			
	• Regulations, Processes, Procedures and Compliance			
1	Human Factors	• Use of policy/Procedures	Events involving the use of the relevant policy or procedures by flight crew	Regulations and/or procedures not complied with
	• Tactical Planning and Execution			
2	Human Factors	• Action Performed Incorrectly	Events involving flight crew performing the selected action incorrectly	Incorrect or ineffective execution
3	Human Factors	• Monitoring of Environment	Events involving flight crew not to appropriately monitoring the environment	Did not avoid/conform with the pattern of traffic already formed
	• Situational Awareness of the Conflicting Aircraft and Action			
4	Contextual	• Situational Awareness and Sensory Events	Events involving a flight crew's awareness and perception of situations	Pilot had no, late, inaccurate or only generic, Situational Awareness
5	Human Factors	• Understanding/ Comprehension	Events involving flight crew that did not understand or comprehend a situation or instruction	Pilot did not assimilate conflict information
	• Electronic Warning System Operation and Compliance			
6	Contextual	• Other warning system operation	An event involving a genuine warning from an airborne system other than TCAS.	
7	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			
8	Human Factors	• Identification/Recognition	Events involving flight crew not fully identifying or recognising the reality of a situation	Late sighting by one or both pilots
9	Human Factors	• Incorrect Action Selection	Events involving flight crew performing or choosing the wrong course of action	Pilot flew close enough to cause concern
	• Outcome Events			
10	Contextual	• Near Airborne Collision with Aircraft	An event involving a near collision by an aircraft with an aircraft, balloon, dirigible or other piloted air vehicles	

Degree of Risk: B.

Safety Barrier Assessment[5]

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

Flight Elements:

Regulations, Processes, Procedures and Compliance were assessed as **partially effective** because the PA28 pilot did not use the overhead join to properly assess, and fit in with, the circuit traffic.

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

Tactical Planning and Execution was assessed as **ineffective** because the PA28 pilot did not conform with the pattern of traffic formed by the DR400.

Situational Awareness of the Conflicting Aircraft and Action were assessed as **ineffective** because the DR400 pilot only had generic situational awareness about the joining PA28 behind in the circuit, and the PA28 pilot had an inaccurate mental model that the DR400 was not in the circuit.

Electronic Warning System Operation and Compliance were assessed as **partially effective** because although the PA28 had information from their EC equipment, they did not use it to confirm the position of the DR400, and although an alert would be expected on the DR400, none was received.

See and Avoid were assessed as **partially effective** because it was a late sighting by both pilots.