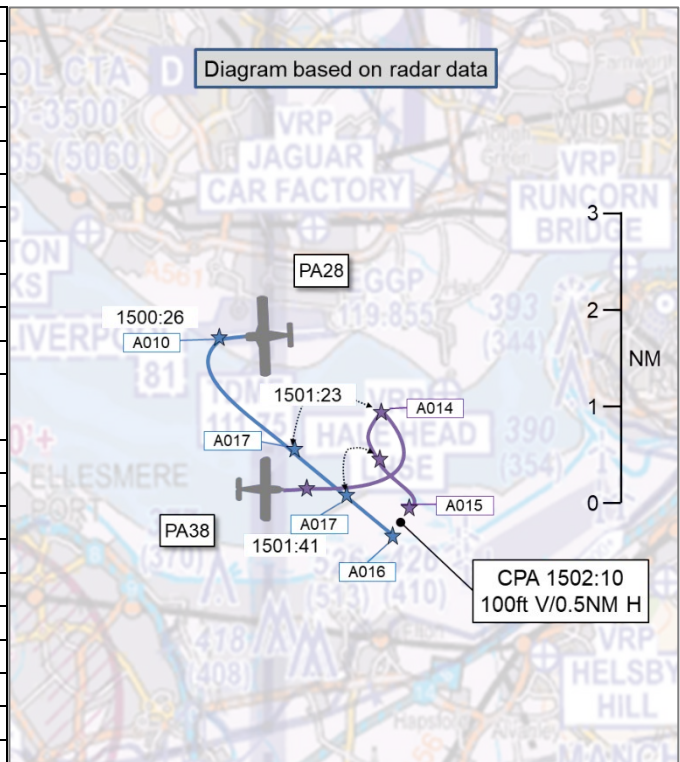


**AIRPROX REPORT No 2024007**

Date: 16 Jan 2024 Time: 1502Z Position: 5318N 00249W Location: 1NM SW of Hale Lighthouse

**PART A: SUMMARY OF INFORMATION REPORTED TO UKAB**

Recorded	Aircraft 1	Aircraft 2
Aircraft	PA28	PA38
Operator	Civ FW	Civ FW
Airspace	Liverpool CTR	Liverpool CTR
Class	D	D
Rules	VFR	VFR
Service	ACS	ACS
Provider	Liverpool Tower	Liverpool Tower
Altitude/FL	1600ft	1500ft
Transponder	A, C, S	A, C, S
<b>Reported</b>		
Colours	White with yellow & red stripe	White with red & yellow stripe
Lighting	Beacon	NR
Conditions	VMC	VMC
Visibility	>10km	>10km
Altitude/FL	1300ft	1100ft
Altimeter	QNH (1002hPa)	QNH (1002hPa)
Heading	120°	240°
Speed	140kt	90kt
ACAS/TAS	SkyEcho	SkyEcho
Alert	None	None
<b>Separation at CPA</b>		
Reported	0ft V/0.1NM H	200ft V/0.25NM H
Recorded	100ft V/0.5NM H	



**THE PA28 PILOT** reports, whilst holding at ‘Golf’, their clearance was changed from VRP Vicar’s Cross [Roundabout] to VRP Helsby Hill due to [local aircraft activity]. They read back the new clearance and then were cleared for take-off, and were warned about the preceding traffic taking-off [a PA38] into the left-hand circuit. They had taken-off on RW27, after which they commenced their climbing turn to Helsby Hill up to an altitude of 1300ft. During this time, the preceding [PA38] student pilot reported downwind. Immediately after this, the Tower controller informed the [PA38 pilot] to take up a right-hand orbit at the end of the downwind leg and that a PA28 was taking-off. The PA38 student pilot correctly read back this instruction to orbit right and that they were looking for the traffic, however they began to turn left into an orbit. From their cockpit [the PA38] appeared to be over the lighthouse. They continued towards Helsby Hill and kept this traffic in-sight. As they were getting closer to the traffic they were unsure about the student pilot’s situational awareness and whether they had spotted them. The Tower controller then proceeded to speak to the pilot of a landing aircraft on a 9 mile final for the ILS on RW27. The pilot landing informed the Tower controller that they were established, to which the Tower controller replied with ‘Roger, cleared to land RW27, aircraft on left base PA38 will pass behind’, instead of saying ‘orbiting at the end of the downwind leg’.

They were now level at 1300ft approaching the south bank [of the Mersey] and the PA38 appeared to be at the same level instead of circuit height of 1085ft QNH. When approaching the middle of the Mersey, the Liverpool Tower controller asked [the PA38 pilot] ‘can you confirm you are in the right hand-orbit.’ to which the student pilot replied ‘Affirm [C/S]’. Immediately after this the student pilot in the PA38 began to exit the left-hand orbit and began a right-hand turn towards their aircraft. [They wondered] whether the Tower controller’s question had sparked the thought that they were in the wrong orbit, but it had made the situation more severe. Due to the intensity of this situation they, as pilot flying, had forgotten to bring the power back but had levelled off at 1300ft so their airspeed had increased to 140kts instead of 110kts. If they had not done this, they believed that they would have been converging more

closely. The Tower controller then proceeded to inform the PA38 pilot to make sure that they were in the right-hand orbit to avoid the final approach and that there was an aircraft on a 9 mile final and an aircraft (their aircraft) 2 miles southwest routeing to Helsby Hill.

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

**THE PA38 PILOT** reports that they took off from RW27 into the left-hand circuit as normal. Turning onto downwind, [they remembered that] they were asked to perform one left-hand orbit to leave spacing for traffic on final. The left-hand orbit was due to [the PA28] having an amended clearance direct to VRP Tarporley Roundabout and this left-hand orbit was to remain out of [the PA28s] track [they believed]. Upon completion of their orbit, they extended the reverse leg slightly to account for the wind drift that would have occurred when turning onto base. The Tower controller informed them of traffic (the PA28) and they started scanning, unaware of how close [the PA28's] actual track was to their orbit path. Upon sighting the PA28 they turned right immediately out of its path and above. The circuit was then completed as normal.

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

**THE LIVERPOOL TOWER CONTROLLER** reports they have been advised that an Airprox was reported at a time they were in the Tower, with a trainee in position. There was one PA38 in a left-hand circuit (they believed to have one POB) which was instructed to orbit right-hand at the end of the downwind leg due to inbound ILS traffic. There was another PA38 [they remembered] (PA28 C/S) which departed RW27 for a flight VFR to the south. The airspace had been given to Hawarden's training traffic.

Liverpool Radar had allowed the VFR departure from Liverpool, but with an amended departure routeing of Helsby Hill to Tarporley Roundabout. This new route was passed to [the PA28 pilot]. Once airborne, the PA38 (circuit traffic) was observed entering a left-hand orbit (they were visible from both the ATM and out of the window). [The PA38 pilot] was provided with Traffic Information on the VFR departure to the southeast and instructed to orbit right-hand on completion of the next orbit. This request was to keep orbits away from the ILS traffic. Immediately after departure [the PA28 pilot] was provided Traffic Information about the circuit traffic holding at the end of the downwind leg. With Traffic Information passed, they (as OJTI) continued to observe the two VFR aircraft out of the window and on the ATM. They noted that on the ATM the two aircraft were not at the same altitude and the circuit traffic reported visual with the departure. No Airprox or comment was made on the frequency. During the scenario (and when traffic permitted) they discussed various scenarios with the trainee about the problem with 'funneling' VFR aircraft through smaller routes due to Hawarden's traffic using Liverpool's airspace.

## Factual Background

The weather at Liverpool was recorded as follows:

METAR EGGP 161450Z 24015KT 9999 BKN042 04/M01 Q1001

## Analysis and Investigation

### Liverpool Unit Investigation

Timeline Breakdown of Incident;

1451 Liverpool Radar gave Hawarden procedural use of the airspace [and a] VFR clearance for a PA28.

1452 Liverpool Radar put a 'check south' on with Liverpool Tower.

1457 Liverpool Tower made a request for a local VFR flight to Vicar's Cross Roundabout VRP. Radar amended the routeing from Vicar's Cross Roundabout to Helsby Hill then Tarporley Roundabout due to the Hawarden traffic utilising the airspace.

1458 [The PA28 pilot] was given the amended clearance and given Traffic Information on the previously departed [PA38] turning into the left-hand visual circuit before being cleared for take-off.

1500 [The PA38 pilot] in the left-hand visual circuit for RW27 was instructed to orbit right at the end of the downwind leg and given Traffic Information on an inbound [aircraft] on final approach.

1501 [The PA28 pilot] was given Traffic Information on [the PA38] stating that "*Traffic is a PA38 orbiting at the end of the downwind, left-hand*".

Shortly after this, the ATCO then asked [the PA38 pilot] (circuit traffic) to confirm that they were commencing right-hand orbits to which the pilot responded 'affirm'.

1502 The ATCO observed that [the PA38] was in fact orbiting left instead of right and asked that on completion of the left-hand orbit to take up right-hand orbits to remain clear of the final approach track, they then passed Traffic Information on [the PA28] as '*PA28 airborne is about 2 miles to the southeast of the airfield indicating 1300ft*'. [The PA38 pilot] read back the instruction and reported '*Traffic in sight*'.

1503 The Tower ATCO transferred [the PA28 pilot] to Liverpool Radar frequency once they were clear of the circuit traffic.

### Investigation Findings

The radar ATCO correctly followed the Letter of Agreement between Liverpool ATSU and Hawarden ATSU by giving an amended route to the southbound VFR local flight to avoid the [affected] airspace. Traffic information was passed to both [the PA28 and PA38 pilots]. [The PA38 pilot] reported the other aircraft in sight but [the PA28 pilot] did not report visual. The aircraft came within 0.5NM of each other and indicated 100ft vertical separation.

### Root Cause of the Event

The root cause appeared to be the current procedures in place within the Letter of Agreement between Liverpool ATSU and Hawarden ATSU. Whilst the Liverpool airspace is delegated [sic], VFR traffic operating to the south of the Liverpool CTR would be expected to fly at or below 1500ft Liverpool QNH and be given routeings to remain clear of [other traffic (sic)].

The alternative routing to remain clear funnels VFR departures to a position in conflict with any aircraft holding midpoint downwind left-hand or left base for RW27 and also then in conflict with any opposite direction VFR inbounds which follow the reciprocal routing. This creates hotspots for Airprox incidents and increases ATCO workload significantly.

A contributing factor was that the circuit traffic initially took up a left-hand orbit instead of right at the end of the downwind leg. Although arguably, even if the circuit traffic followed the correct instruction of orbiting right, it would still have put the two aircraft in conflict. It did, however, increase the Tower controller's workload as they were monitoring that the aircraft did not stray too close to the final approach track which may have caused delayed Traffic Information to [the PA38 pilot] on [the PA28].

### UKAB Secretariat

An analysis of NATS radar replay showed the routing of the PA28 and the left-hand orbit flown by the PA38 pilot downwind, with the CPA occurring as the PA38 exited the left turn and initiated the right-hand orbit (Figure 1).

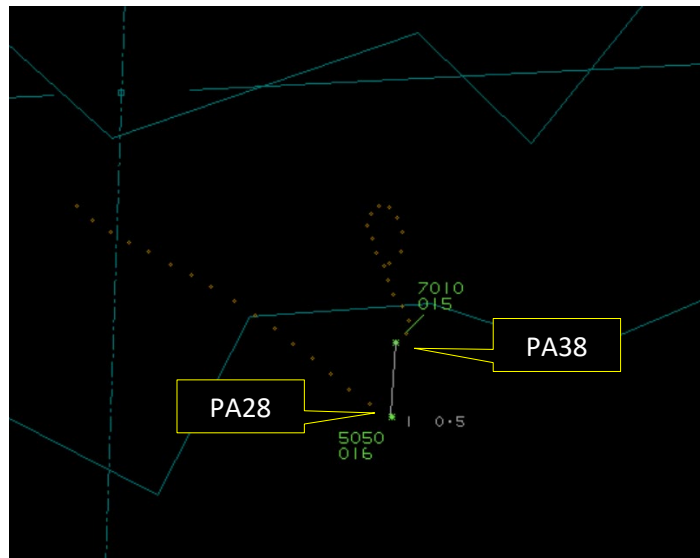


Figure 1 – Time 1502:10 CPA 100ft 0.5NM

The PA28 and PA38 pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard.<sup>1</sup> If the incident geometry is considered as head-on or nearly so then both pilots were required to turn to the right.<sup>2</sup> If the incident geometry is considered as converging then the PA38 pilot was required to give way to the PA28.<sup>3</sup> 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.<sup>4</sup>

## Summary

An Airprox was reported when a PA28 and a PA38 flew into proximity 1NM southwest of VRP Hale Head Lighthouse at 1302Z on Tuesday 16<sup>th</sup> January 2024. Both pilots were operating under VFR in VMC, both in receipt of an ACS from Liverpool Tower.

## **PART B: SUMMARY OF THE BOARD'S DISCUSSIONS**

Information available consisted of reports from both pilots, radar photographs/video recordings, a report from the air traffic controller involved and a report from the appropriate operating authority. 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 considered the actions of the PA28 pilot departing to the south and agreed that they had had full situational awareness and had conducted their flight well. It was acknowledged that they had been concerned about the actions of the PA38 pilot, who had not correctly followed ATC instructions.

Turning their attention to the actions of the student pilot in the PA38, the members reiterated their own concerns that the student pilot had made the initial orbit in the wrong direction and had then also confirmed a right-hand orbit. However, despite the initial error, members considered that as the student pilot was visual with the PA28 that this had not been a factor in the Airprox.

Considering the actions of the Tower controller, the Board accepted that the instructions issued had been in accordance with their procedures, and that they had had good situational awareness of the circuit traffic issue in regards to the incorrect orbit direction. However, members felt that the controller had potentially devoted too much attention on the arriving IFR traffic, manoeuvring the PA38 to avoid

<sup>1</sup> (UK) SERA.3205 Proximity.

<sup>2</sup> (UK) SERA.3210 Right-of-way (c)(1) Approaching head-on.

<sup>3</sup> (UK) SERA.3210 Right-of-way (c)(2) Converging.

<sup>4</sup> (UK) SERA.3225 Operation on and in the Vicinity of an Aerodrome.

that, and less consideration to the position of the departing PA28 and its routing towards the orbiting PA38.

The Board then considered the effectiveness of electronic conspicuity in this scenario and noted that both pilots had been carrying compatible equipment which had not provided an alert to either of them as may have been expected. The Board was disappointed that this had been the case but was unable to establish why the equipment had not provided a warning to either pilot.

**CF1.** Compatible electronic warning systems did not provide an alert as expected.

**CF2.** The PA28 pilot was concerned by the proximity of the PA38.

### **PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK**

#### Contributory Factors:

2024007				
CF	Factor	Description	ECCAIRS Amplification	UKAB Amplification
<b>Flight Elements</b>				
<b>• Electronic Warning System Operation and Compliance</b>				
1	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
<b>• See and Avoid</b>				
2	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: E.

#### Safety Barrier Assessment<sup>5</sup>

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

#### **Flight Elements:**

**Electronic Warning System Operation and Compliance** were assessed as **ineffective** because although both pilots carried compatible systems, neither of them alerted the pilots as they may have been expected to do.

<sup>5</sup> The UK Airprox Board scheme for assessing the Availability, Functionality and Effectiveness of safety barriers can be found on the [UKAB Website](#).

<b>Airprox Barrier Assessment: 2024007</b>		Outside Controlled Airspace						
<b>Barrier</b>		<b>Provision</b>	<b>Application</b>	<b>Effectiveness</b>				
				<b>Barrier Weighting</b>				
				0%	5%	10%	15%	20%
Ground Element	Regulations, Processes, Procedures and Compliance	✓	✓					
	Manning & Equipment	✓	✓					
	Situational Awareness of the Confliction & Action	✓	✓					
	Electronic Warning System Operation and Compliance	○	○					
Flight Element	Regulations, Processes, Procedures and Compliance	✓	✓					
	Tactical Planning and Execution	✓	✓					
	Situational Awareness of the Conflicting Aircraft & Action	✓	✓					
	Electronic Warning System Operation and Compliance	✓	✗					
	See & Avoid	✓	✓					
<b>Key:</b>		<b>Full</b>	<b>Partial</b>	<b>None</b>	<b>Not Present/Not Assessable</b>	<b>Not Used</b>		
Provision	✓	○	✗	○				
Application	✓	○	✗	○				
Effectiveness								