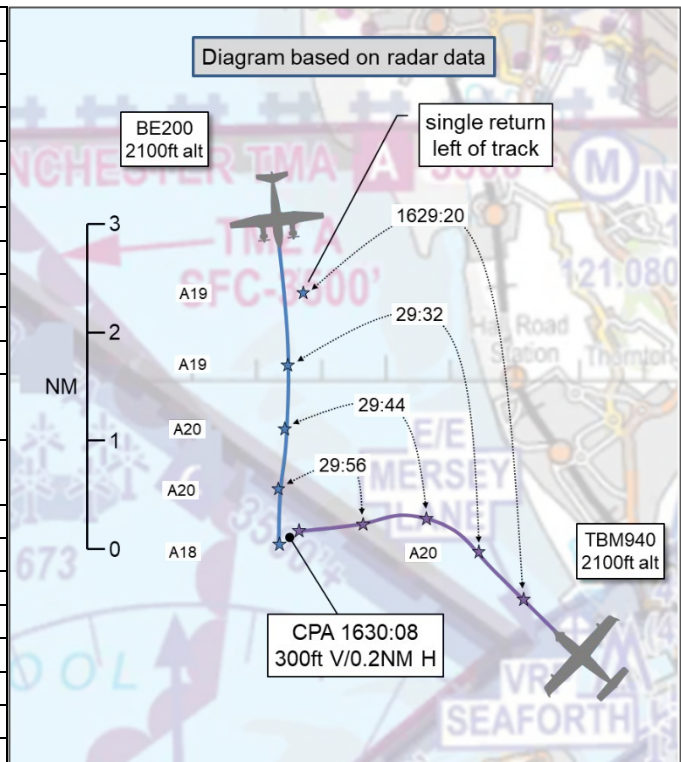


AIRPROX REPORT No 2022014

Date: 15 Feb 2022 Time: 1630Z Position: 5328N 00306W Location: 2NM NW Seaforth VRP

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	BE200	TBM940
Operator	Civ Comm	Civ FW
Airspace	London FIR	London FIR
Class	G	G
Rules	VFR	VFR
Service	Traffic	Basic
Provider	Liverpool	Liverpool
Altitude/FL	1800ft	2100ft
Transponder	A, C, S+	A, C, S+
Reported		
Colours	White, Blue	Gold, Red, Silver, Black
Lighting	Nav, Beacon, Strobe, Landing	Nav, strobe, Landing
Conditions	VMC	VMC
Visibility	>10km	>10km
Altitude/FL	2000ft	2000ft
Altimeter	QNH (1000hPa)	QNH (1000hPa)
Heading	180°	270°
Speed	180kt	150kt
ACAS/TAS	TCAS II	TCAS II
Alert	RA	TA
Separation at CPA		
Reported	0ft V/NK H	0-500ft V/1-2NM H
Recorded	300ft V/0.2NM H	



THE BE200 PILOT reports that the flight was operated with a single pilot and with two (non-pilot) systems operators on board. They had just completed operational tasking, routing southbound along the coast at 2000ft, and were in contact with Warton. They requested transfer to Liverpool with the intention of a VFR zone transit. They made contact with Liverpool Radar, the frequency was fairly busy and they requested a Traffic Service and VFR zone transit. They were cleared for the transit VFR not above 2500ft routing WAL to WHI. At approximately 5-10NM north of WAL, Radar began passing Traffic Information on a TBM aircraft to the east of them routing in their general direction from Liverpool airport area. The workload was high at this point and the pilot heard a few calls between ATC and other traffic leading up to this but didn't fully comprehend them. Whilst ATC was passing the Traffic Information to them, they became visual with an aircraft approx 2NM to the west that looked like it was routing north-north westbound which would result in it passing by 1-2NM laterally. This was shortly followed by a "Traffic Traffic" call from the TCAS. They glanced down at the TCAS and noticed the vertical separation at that time was that the other aircraft was 100ft below. They looked back to the traffic to maintain visual separation. All of this happened whilst receiving the Traffic Information call from ATC. They began replying to ATC calling visual with the traffic and something else which due to the workload in the situation they have since forgotten, possibly that they were now under Radar Control Service. During their call to ATC, the aircraft they were visual with appeared to turn westbound towards them, at which point they received a TCAS RA to descend. They stopped the call to ATC part way through the message calling TCAS RA and began a steep descent. (RA showing a green band between 2000-2500fpm descent). A further call of "Increase vertical speed" was received very shortly afterwards and the descent was increased although now approaching 1000ft. During the level out and climbing back again up to 2000ft, a single GPWS callout was heard. Visual contact was maintained at all times up until the TCAS RA from the TBM which appeared to maintain its altitude as it passed above and behind them. The RA was followed in case it did not relate to the aircraft they were visual with, as trained. Situational

awareness of the TBM was maintained throughout but it became an issue when the aircraft turned directly towards them at the same altitude resulting in the above actions. Separation was not exactly known due to change of focus when following the TCAS RA – the initial traffic warning showed as conflicting traffic 100ft below. The System Operator described the passing separation as: "*Aircraft was behind to your left. It took a turn to its right and passed behind us. It looked same level or within 100ft and was fairly close*". After the event, they believed the pilot in the conflicting aircraft reported having the BE200 in sight the whole time, but opined that they found it strange that the TBM pilot would turn almost directly towards them.

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

THE TBM940 PILOT reports that they departed VFR from Liverpool RW27. They were told to head north and leave the zone at Seaforth VRP at 2000ft. They were provided with a Traffic Service after departure. ATC informed them that there was a police helicopter in their 10 o'clock, 1000ft below. They reached Seaforth and turned west to leave the Zone. Almost immediately the TCAS warned of another aircraft SAME HEIGHT. Then SAME HEIGHT 1 O'CLOCK. They then saw the aircraft and banked to the right to avoid behind. They could see that the other aircraft was descending and asking Liverpool to transit the zone north-south. They [the TBM pilot] said to ATC "*that was close.*" The other pilot responded to ATC saying that they were visual with the TBM.

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

THE LIVERPOOL CONTROLLER reports that at approx 1627Z the TBM940, departed Liverpool out towards Seaforth VRP on a local flight. A couple of minutes later, [BE200 C/S] called up on frequency requesting a Traffic Service outside [the Zone]. After taking the details of [BE200 C/S], the controller made a reasonable assumption as to which #7000 [squawk] it was, and passed Traffic Information to them on [the TBM] who was now leaving the zone at Seaforth VRP and tracking towards the BE200 at a similar level. As [TBM C/S] left the zone at Seaforth, they then passed the Traffic Information to the TBM pilot on the BE200, to which they replied that they had it on TCAS and were making a westerly turn. The controller acknowledged this and stated that it was now a Basic Service outside controlled airspace. [BE200 C/S] was then issued with a clearance to enter controlled airspace not above altitude 3000ft VFR to allow for a climb should they need it. As the pilot was reading back the clearance, it was interrupted by a TCAS RA, due to [TBM C/S] having turned quite close towards the BE200. They asked [TBM C/S] whether they were visual with the BE200, to which they replied 'it was pretty close but yes they were visual'. After reporting clear of traffic, [BE200 C/S] said they had been visual with the traffic but complied with TCAS RA. The BE200 then entered controlled airspace and continued on course to WHI.

Factual Background

The weather at Liverpool was recorded as follows:

METAR EGGP 151620Z 25010KT 9999 FEW040 08/04 Q1000=

Analysis and Investigation

CAA ATSI

ATSI had access to initial reports from the Liverpool Radar controller, the pilots of both aircraft, and a brief investigation report from Liverpool ATC Management. The Liverpool RTF and the Area Radar recordings were reviewed for the relevant period. Screenshots within this report have been taken from the Area Radar recording and are not necessarily indicative of what the controller was viewing at the time. The levels displayed in the screenshots are Flights Levels, the QNH entered into the radar display processor was 1004 hPa, a difference of minus 243ft when calculating the relevant altitude.

The Liverpool Radar controller was dealing with other traffic at the time of the event, including providing pilots of inbound traffic with vectors to the ILS. In the interests of brevity, only the RTF relating to the two aircraft involved in the Airprox have been included in this report.

At 1627.00 the TBM940 pilot was transferred from the Tower controller to the Radar controller and advised the Radar controller that they were outbound via Seaforth at 2000ft. The controller acknowledged the call, instructed the pilot to report at Seaforth and passed Traffic Information on unrelated traffic, *“you may see a police helicopter to your left 10 o’clock 2 miles manoeuvring 1000ft below”*. The pilot responded, *“we have him on TCAS”*. The controller then passed reciprocal Traffic Information to the pilot of the other aircraft (Figure 1).

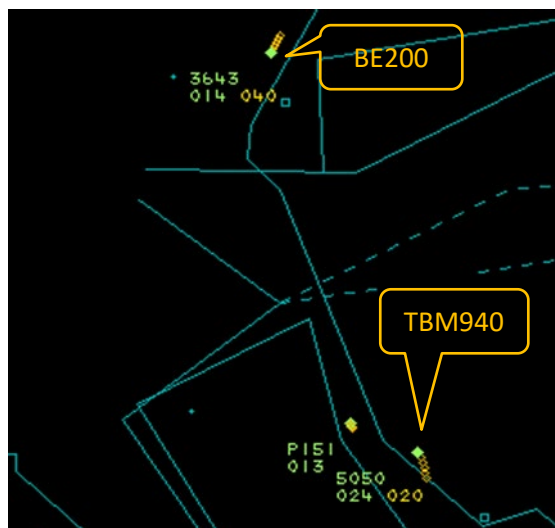


Figure 1 - 1627.00

At 1628.20 the TBM940 pilot asked the controller if it would be possible for them to inform the Fire Department that they had solved the problem on the engine and that all indications were normal. The controller agreed to do this, and the pilot thanked them for their help.

At 1629.00 the BE200 pilot called the Liverpool Radar controller and requested a Traffic Service and Zone transit. The controller instructed the pilot to squawk 5055 and pass their details. The pilot read back the squawk and advised that they were a *“Beech 200, [departure airfield] routing now back to [destination], currently 1500ft, just routing southbound along the coast, requesting transit via Wallasey Whitegate.”* The controller responded, *“callsign, Traffic Service outside, I do have traffic just leaving my zone at Seaforth 2000ft currently still tracking north bound it’s a TBM940.”* The pilot responded, *“roger that’s copied thanks and sorry, clarify the squawk code?”* The controller repeated the squawk and the pilot read this back (Figure 2).

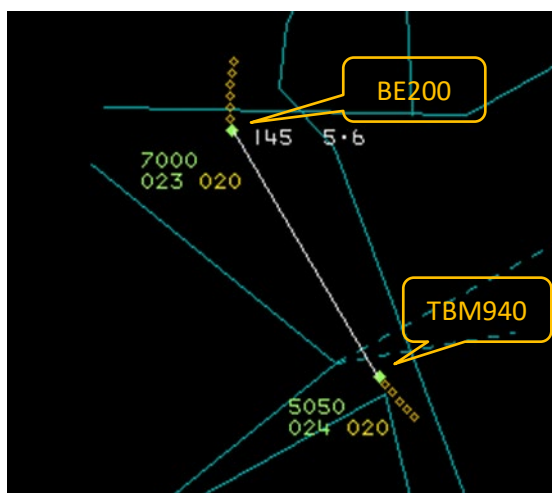


Figure 2 - 1629.00

At 1629.40 the controller advised the TBM940 pilot, “*you’re leaving controlled airspace now, keep a look out, traffic at your 12 o’clock 2 miles right to left indicating 1800ft.*” The pilot responded, “*We have him on TCAS, and we are turning to the west, taking up heading of 270°.*” The controller advised that it would be a Basic Service outside controlled airspace and the pilot read back, “*Basic Service*” (Figure 3).

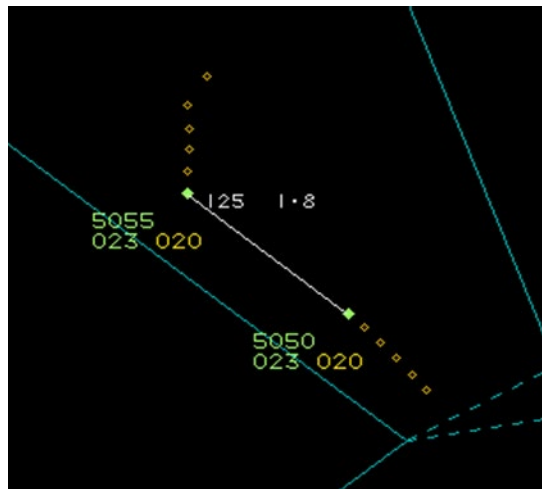


Figure 3 - 1629.40

At 1629.50 the BE200 pilot was cleared to enter controlled airspace not above altitude 3000ft VFR. The pilot read back the clearance verbatim and then there was some background noise and the pilot said, “*standby TCAS RA*”.

At 1630.07 CPA occurred with the aircraft separated by 0.2NM laterally and an indicated 300ft vertically (Figure 4).

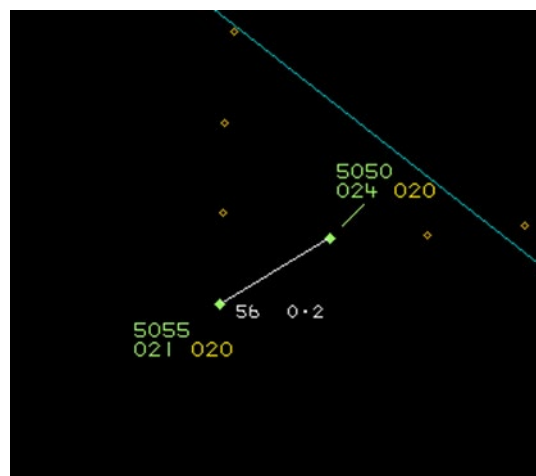


Figure 4 - 1630.07 CPA

At 1630.20 the controller asked the TBM940 pilot if they were, “*visual with that traffic*”. The pilot responded, “*we are, it was pretty close, but we are visual with him, roger.*”

At 1630.40 the BE200 pilot said, “*clear of traffic, we were visual with them but followed TCAS RA anyway.*” The controller said no problem and cleared the pilot to enter controlled airspace not above 2500ft VFR on QNH 1000hPa. The pilot initially read back not above 2000ft and the controller reiterated 2500ft and the pilot read this back correctly.

Analysis



Figure 5 – Seaforth VRP

The TBM940 pilot had encountered engine problems prior to coming onto the Radar frequency and this may potentially have created an ongoing distraction to the pilot, in terms of ongoing monitoring of the situation.

The request from the TBM940 pilot to call the Fire Department and advise them that the engine problem had cleared came less than 2 minutes before CPA and may potentially have caused distraction to the controller.

When the BE200 pilot made their initial call to the controller to request a service they were already in conflict with the TBM940. The controller correctly prioritised passing Traffic Information to the pilot of the BE200 over identifying the traffic. The Traffic Information, whilst not provided in terms of where the traffic was in relation to the BE200, was provided using a published VRP (that the TBM940 had just passed over) as the reference point and contained the direction of flight and altitude of the TBM940. The pilot responded that they had copied the traffic and subsequently reported that they had been visual with the TBM940 before CPA and had followed the RA in accordance with standard procedure.

The TBM940 pilot was passed specific and accurate Traffic Information on the BE200 when there was 1.8NM between the two aircraft and the pilot reported having the BE200 on TCAS. The TBM940 pilot took the decision to turn onto a westerly heading at this point, and this took the TBM940 into conflict with the BE200 and into their TCAS RA envelope.

The TBM940 pilot reported being visual with the BE200 after CPA, however it is not known to ATSI whether they were visual with it before CPA.

Conclusion

The Traffic Information passed to the TBM940 pilot enabled the pilot to identify the BE200 as a confliction on their TCAS. The subsequent decision taken by the TBM940 pilot, to turn onto a westerly heading, resulted in the TBM940 entering the TCAS RA envelope of the BE200. The Traffic Information passed to the BE200 pilot enabled the pilot to gain sight of the TBM940 and the BE200 pilot followed their TCAS RA instruction in accordance with standard procedure.

UKAB Secretariat

The BE200 and TBM940 pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard.¹ If the incident geometry is considered as converging then the TBM940 pilot was required to give way to the BE200.²

Summary

An Airprox was reported when a BE200 and a TBM940 flew into proximity 2NM NW of Seaforth VRP at 1630Z on Tuesday 15th February 2022. Both pilots were operating under VFR in VMC, the BE200 pilot was in receipt of a Traffic Service from Liverpool Radar and the TBM940 pilot was in receipt of a Basic Service, also from Liverpool Radar.

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 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.

Members first discussed the actions of the BE200 pilot. They needed to transit through the Liverpool CTA and called the Liverpool controller for clearance. During the initial call the controller gave the pilot Traffic Information on the TBM940 and the BE200 pilot became visual with it and perceived that it was not a threat. However, when the TBM940 turned towards the BE200, the TCAS in the BE200 alerted with an RA which the pilot followed (**CF3**). Despite being visual with it, the pilot had to follow the TCAS RA in case it was alerting on another, unseen aircraft and whilst following the TCAS RA lost sight of the TBM940.

Turning to the TBM940 pilot, members noted that they were given Traffic Information on the BE200 and reported having it on their TCAS, so members were unsure why the pilot turned onto west towards it (**CF2**). Some members opined that they may have been distracted by the call to ATC about their previous engine problem, but even so thought that the pilot should have been more aware that a turn towards the BE200 would be likely to cause a TCAS RA, they had a responsibility to remain clear of other aircraft, and a wiser plan would have been to wait until it had cleared to the south before turning (**CF1**). Once they had turned towards the other aircraft they received a TCAS TA (**CF4**), became visual with it, and adjusted their flight to go behind, albeit too late to avoid alerting the TCAS in the BE200 (**CF5**).

The Board briefly looked at the role of ATC. The Liverpool controller was providing a Traffic Service to the BE200 and gave Traffic Information as they were required to do. Some members noted that the controller had automatically placed the TBM940 under a Basic Service on leaving the CTA, without asking the pilot what type of service they required. Controlling members pointed out that the pilot could have asked for a Traffic Service if they had wanted one, and, notwithstanding the type of service being provided, the controller had given Traffic Information to the TBM940 pilot anyway, so a Traffic Service would not have made any difference on this occasion.

When assessing the risk, some members opined that this had been normal operations in Class G airspace and that the Airprox had been reported because of the TCAS RA. They noted that TCAS was not designed for use in Class G airspace where pilots could be visual with conflicting aircraft and take visual separation, but still the TCAS would alert. Others thought that there was more to the Airprox than just the TCAS RA, in that both pilots had been given enough information for them to know where the other aircraft was when still at range, and yet had ended up 300ft and 0.2NM apart, after the BE200 had followed the TCAS RA descent advice. The latter view prevailed and the Board assessed that

¹ (UK) SERA.3205 Proximity.

² (UK) SERA.3210 Right-of-way (c)(2) Converging.

although the descent by the BE200 pilot had ensured there had been no risk of collision, safety had been degraded; Risk Category C.

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

Contributory Factors:

	2022014			
CF	Factor	Description	ECCAIRS Amplification	UKAB Amplification
Flight Elements				
• Tactical Planning and Execution				
1	Human Factors	• Insufficient Decision/Plan	Events involving flight crew not making a sufficiently detailed decision or plan to meet the needs of the situation	Inadequate plan adaption
• Situational Awareness of the Conflicting Aircraft and Action				
2	Human Factors	• Lack of Action	Events involving flight crew not taking any action at all when they should have done so	Pilot flew close enough to cause concern despite Situational Awareness
• Electronic Warning System Operation and Compliance				
3	Contextual	• ACAS/TCAS RA	An event involving a genuine airborne collision avoidance system/traffic alert and collision avoidance system resolution advisory warning triggered	
4	Contextual	• ACAS/TCAS TA	An event involving a genuine airborne collision avoidance system/traffic alert and collision avoidance system traffic advisory warning triggered	
• See and Avoid				
5	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

Degree of Risk: C.

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:

Flight Elements:

Tactical Planning and Execution was assessed as **partially effective** because the TBM940 pilot did not adapt their plan to take into consideration the position of the BE200.

Situational Awareness of the Conflicting Aircraft and Action were assessed as **partially effective** because, despite having situational awareness from both the TCAS and Traffic Information given by ATC, the TBM940 pilot had turned towards the BE200.

³ 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: 2022014		Outside Controlled Airspace					
Barrier	Provision	Application	Effectiveness				
			Barrier Weighting				
			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	✓	✓				
Key:		Full	Partial	None	Not Present/Not Assessable	Not Used	
Provision	✓	⚠	✗	○			
Application	✓	⚠	✗	○		○	
Effectiveness							