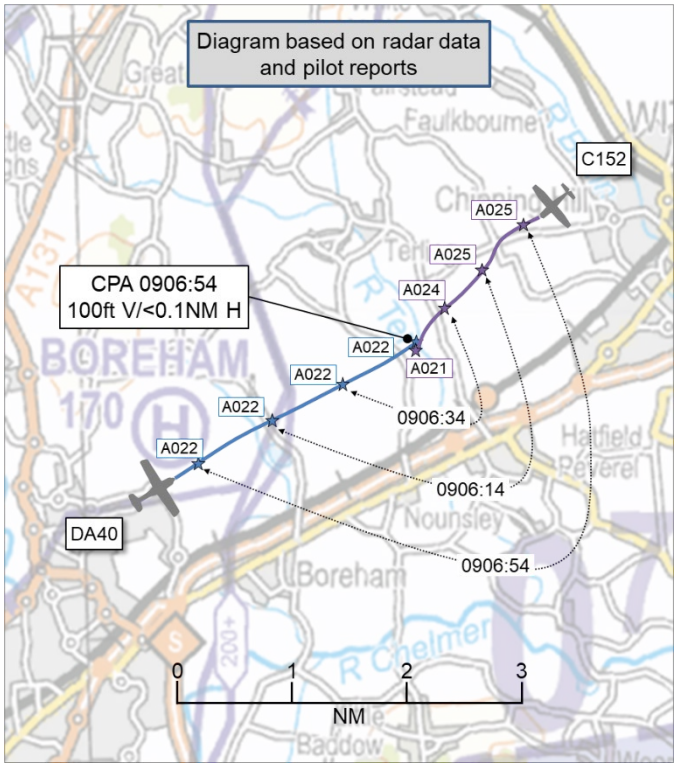
AIRPROX REPORT No 2024139

Date: 21 Jun 2024 Time: 0907Z Position: 5147N 00035E Location: 2NM ENE of Boreham

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	DA40	C152
Operator	Civ FW	Civ FW
Airspace	London FIR	London FIR
Class	G	G
Rules	VFR	VFR
Service	Basic	Listening Out
Provider	Southend Radar	Southend Radar
Altitude/FL	2200ft	2100ft
Transponder	A, C, S	A, C, S
Reported		
Colours	White/blue decals	Green/White
Lighting	strobes	Nav, landing, bcn
Conditions	VMC	VMC
Visibility	>10km	>10km
Altitude/FL	2200ft	2000ft
Altimeter	QNH (1014hPa)	QNH
Heading	070°	225°
Speed	125kt	90kt
ACAS/TAS	PilotAware	Not fitted
Alert	Information	N/A
Separation at CPA		
Reported	50ft V/100m H	0ft V/50m H
Recorded	100ft V/<0.1NM H	



THE DA40 PILOT reports that they had changed [their radio frequency] to Southend Radar just before Chelmsford and were settled in the cruise phase of the flight heading to Colchester. Several contacts were shown by [their EC equipment], so they were maintaining what they hoped was a good lookout when, out of nowhere, a blue Cessna appeared on a reciprocal heading. They both made left turns to avoid the conflict.

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

THE C152 PILOT reports that they were conducting a lesson with a student in the left seat, teaching climbing and descending part 2. They were about halfway through the lesson and had just turned back onto a southwesterly heading at Witham. They were in straight and level flight at around 2000ft about to commence the next exercise. The student spotted the DA40 first. It was on a reciprocal heading, at the same level, inside 0.5NM, and looked set to pass down their right-hand side probably within less than 50m. They did not judge that there was an actual risk of collision but as a precaution they took control and put their aircraft into a steep left turn to increase the spacing. The DA40 never altered course and they discussed that they [the DA40 pilot] had probably not seen them [the C152].

The pilot assessed the risk of collision as 'None'.

THE SOUTHEND RADAR CONTROLLER reports that they had been made aware from the ATS manager that an Airprox had been reported by the pilot of [the DA40] who was on a Basic Service against [the C152 pilot] who was not on their frequency but was squawking the Southend Frequency Monitoring Code. [The DA40] was not being monitored at the time of the incident due to being on a Basic Service and their workload was focused on other tasks. They were also not made aware of the incident at the time by the pilot of [the DA40].

Factual Background

The weather at Southend was recorded as follows:

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METAR EGMC 210850Z VRB03KT 9999 FEW030 19/12 Q1014
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CAP 774 – UK Flight Information Services, Chapter 2, Para 2.1 states that:

> A Basic Service is an ATS provided for the purpose of giving advice and information useful for the safe and efficient conduct of flights. This may include weather information, changes of serviceability of facilities, conditions at aerodromes, general airspace activity information, and any other information likely to affect safety. The avoidance of other traffic is solely the pilot's responsibility.
>
> *Basic Service relies on the pilot avoiding other traffic, unaided by controllers/FISOs. It is essential that a pilot receiving this ATS remains alert to the fact that, unlike a Traffic Service and a Deconfliction Service, the provider of a Basic Service is not required to monitor the flight.*

Analysis and Investigation

Southend ATC

An Airprox was notified to London Southend Airport ATC by the United Kingdom Airprox Board (UKAB) regarding two aircraft that had been operating in Class G (uncontrolled) airspace. At the time of the Airprox, the DA40 was on a local flight and was in receipt of a Basic Service from Southend Radar. When UKAB notified Southend ATC of this Airprox, they were not aware of the identity of the second aircraft.

Following analysis of the recorded surveillance data, however, the reported time and the geometry of the occurrence would suggest that [the second aircraft] was the C152 which was not receiving a service from Southend, but was squawking the Southend Frequency Monitoring Code, and was therefore likely to have been operating autonomously.

Whilst investigating this occurrence, the investigator had access to the recorded R/T, and surveillance data consisting of the 'at the glass' recordings of the Southend Radar Controller's Working Position (CWP). At the time of the occurrence the Southend Radar controller was providing an Approach control service in combined 'band-boxed' configuration, and the traffic loading was low.

At time 0901:56 the DA40 pilot called Southend Radar and requested a Basic Service. They reported that they were on a local navigational exercise at 2200ft. At this time, the DA40 was squawking the VFR conspicuity code. The Southend Radar controller instructed the pilot to squawk 5060, and a Basic Service was agreed. Co-incident to this, according to the recorded surveillance data, the C152 was observed to be to the south of Boreham squawking the Southend Frequency Monitoring Code (FMC) and tracking northeast.

At time 0905:52, according to the recorded surveillance data, the C152 had turned right onto a south-westerly track.

At time 0906:52 CPA occurred with the subject aircraft on opposite direction tracks. At this time, the DA40 was indicating level at 2200ft, and the C152 was indicating 2100ft in the descent (unverified). At the time the Airprox occurred, the DA40 pilot was operating in Class G (uncontrolled) airspace, and was in receipt of a Basic Service from Southend Radar.

The C152 pilot was likely to have been operating autonomously, and was also in Class G (uncontrolled) airspace. At the time of the Airprox, the C152 was squawking the Mode A code 5050 which is allocated to Southend for the purpose of a Frequency Monitoring Code (FMC). FMCs are also known as 'listening squawks', and were introduced as a measure to reduce the number, and impact, of controlled airspace infringements. Use of an FMC does not imply that the aircraft is

receiving an ATS, and in Class G airspace it is wholly the responsibility of the pilot to avoid other traffic.

Post-occurrence, the Southend Radar controller stated that they were unaware of the Airprox until the notification from UKAB was received. They also stated that, at the time, they had not been monitoring the DA40, and under the terms of a Basic Service nor were they required to. Neither pilot reported that an Airprox had occurred directly to Southend ATC.

UKAB Secretariat

An analysis of the NATS radar was undertaken and both aircraft were identified using Mode S data. The DA40 was seen maintaining an east-northeasterly heading from 0904 toward CPA at 2200ft. At 0905 the C152 turned right into a clockwise orbit east-northeast of the CPA, exiting at 0905:58 towards the DA40 (Figure 1). At 0906:34 the C152 started a gradual descent from 2500ft.

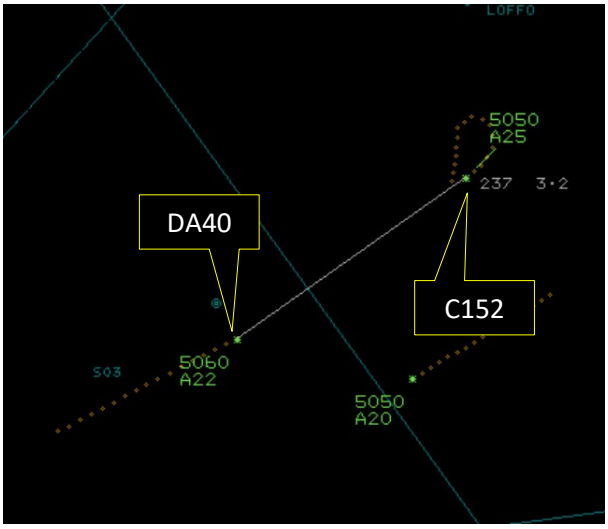

Figure 1- Time 0905:58 C152 exiting the right turn.

The Airprox was visible, with the CPA occurring at 0906:54 with 0.0NM horizontal and 100ft vertical separation indicated as the aircraft crossed (Figure 2). However, due to potential radar inaccuracies the horizontal distance is recorded above as less than 0.1NM.

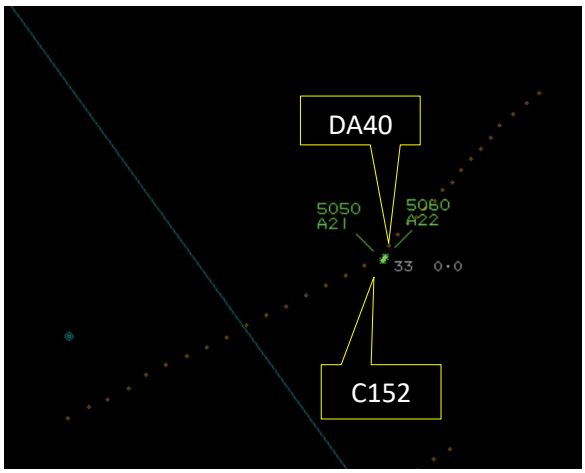

Figure 2 – Time 0906:54 CPA indicates 0NM and 100ft separation.

The DA40 and C152 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 head-on or nearly so then both pilots were required to turn to the right.[2]

Summary

An Airprox was reported when a DA40 and a C152 flew into proximity 2NM east-northeast of Boreham at 0907Z on Friday 21st June 2024. Both pilots were operating under VFR in VMC, the DA40 pilot in receipt of a Basic Service from Southend Radar and the C152 pilot not in receipt of an ATS.

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 looked at the actions of the DA40 pilot and noted that they had been flying in a very busy part of uncontrolled Class G airspace to the northwest of the Southend CTA. Members were pleased to see that the DA40 pilot had been using EC equipment which had supplied information on proximate traffic and had alerted them to look out, although it was mentioned that it was entirely possible that the EC had not necessarily detected the C152, or that the DA40 pilot had not optimally actioned that information (**CF4**). The Board agreed that the DA40 pilot's situational awareness had only been generic with the information that they had had from their EC equipment (**CF3**) and that this would have been much improved if the pilot had requested a Traffic Service (**CF2**). Members noted that, despite the DA40 pilot's 'good lookout', the pilot had only sighted the C152 at a late stage (**CF5**).

Turning their attention to the C152 pilot, the Board made the same comments regarding the use of a Traffic Service in this busy piece of airspace and members considered that, rather than simply listening out on Southend's Radar frequency and squawking the FMC, the C152 pilot may have been better served by seeking a surveillance-based service from Southend (**CF2**). Members thought that the instructor had missed a teaching opportunity to have demonstrated the use of a Traffic Service and how it may have assisted in preventing a close encounter between the C152 and DA40. Members also discussed whether application of the 'semi-circular rule' could have assisted in generating a degree of 'procedural' height deconfliction, but decided that, for pilots flying VFR below 3000ft, this would be a personal choice and by no means a widespread method to employ. The Board agreed that, with no Traffic Service in place and no EC equipment on board, the C152 pilot had had no situational awareness of the presence of the DA40 (**CF3**). The Board also agreed that the C152 pilot had had a late sighting of the DA40, noting that they had made a precautionary manoeuvre to the left as the DA40 had been about to pass down their right-hand side (**CF5**).

The Board then looked at the actions of the Southend Radar controller and noted that, although the DA40 pilot had only been in receipt of a Basic Service, a 300ft vertical separation between aircraft on reciprocal and conflicting headings, bearing in mind the inaccuracies of radar, had been worthy of a traffic warning, as described in CAP774, Ch2, para 2.8. Nonetheless, members agreed that the controller had not been required to monitor the DA40's flight under the terms of a Basic Service (**CF1**).

When considering the risk involved in this event the Board agreed that, despite the late sighting by both pilots, the evasive action taken by both the DA40 and C152 pilots combined had been sufficient that the risk of collision had been reduced. However, members agreed that safety had been reduced much below the norm and that the collision risk had not been removed entirely (**CF6**). Consequently, the Board assigned a Risk Category B to this Airprox.

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

[1] (UK) SERA.3205 Proximity.
[2] (UK) SERA.3210 Right-of-way (c)(1) Approaching head-on.

Contributory Factors:

	2024139			
CF	**Factor**	**Description**	**ECCAIRS Amplification**	**UKAB Amplification**
	Ground Elements			
	• Situational Awareness and Action			
1	Contextual	• ANS Flight Information Provision	Provision of ANS flight information	The ATCO/FISO was not required to monitor the flight under a Basic Service
	Flight Elements			
	• Tactical Planning and Execution			
2	Human Factors	• Communications by Flight Crew with ANS	An event related to the communications between the flight crew and the air navigation service.	Pilot did not request appropriate ATS service or communicate with appropriate provider
	• Situational Awareness of the Conflicting Aircraft and Action			
3	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
	• Electronic Warning System Operation and Compliance			
4	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			
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
	• Outcome Events			
6	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[3]

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

Ground Elements:

Situational Awareness of the Confliction and Action were assessed as **not used** because the Southend Radar controller had not been required to monitor the DA40's flight under the terms of a Basic Service.

Flight Elements:

Tactical Planning and Execution was assessed as **partially effective** because both the DA40 pilot and the C152 pilot could have requested a Traffic Service from Southend.

Situational Awareness of the Conflicting Aircraft and Action were assessed as **ineffective** because the DA40 pilot had only had generic situational awareness of the presence of the C152, and the C152 pilot had had no situational awareness of the presence of the DA40.

Electronic Warning System Operation and Compliance were assessed as **partially effective** because the DA40 pilot could have manoeuvred their aircraft based on the information received from their TAS to deconflict from the C152.

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

See and Avoid were assessed as **partially effective** because both the DA40 pilot and the C152 pilot only saw the other's aircraft at a late stage.