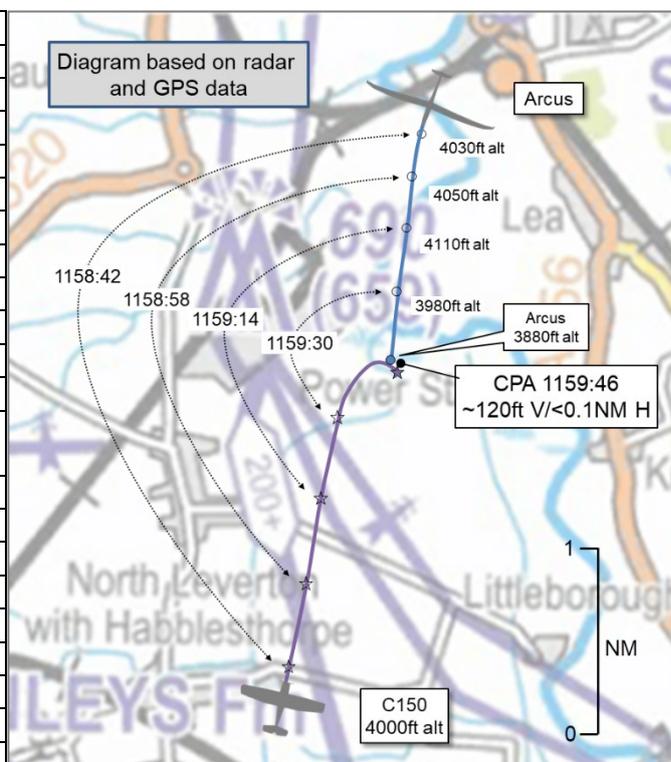


AIRPROX REPORT No 2022198

Date: 27 Aug 2022 Time: 1200Z Position: 5321N 00047W Location: 2.5NM SSW of Gainsborough

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

| Recorded | Aircraft 1 | Aircraft 2 |
|-------------------|-------------------|-------------------------------------|
| Aircraft | Arcus | C150 |
| Operator | Civ Gld | Civ FW |
| Airspace | London FIR | London FIR |
| Class | G | G |
| Rules | VFR | VFR |
| Service | None | Listening Out |
| Provider | N/A | Gamston Radio |
| Altitude/FL | 3880ft | 4000ft |
| Transponder | Not fitted | A, C |
| Reported | | |
| Colours | White, Red | White, Blue, Red |
| Lighting | Nil | Anti-col, Beacon, Taxi/landing, Nav |
| Conditions | VMC | VMC |
| Visibility | >10km | NR |
| Altitude/FL | 3950ft | 2000ft |
| Altimeter | QFE (1020hPa) | QNH (NR hPa) |
| Heading | 185° | NR |
| Speed | 80kt | NR |
| ACAS/TAS | FLARM | Not fitted |
| Alert | None | N/A |
| Separation at CPA | | |
| Reported | 10ft V/90m H | Not seen |
| Recorded | ~120ft V/<0.1NM H | |



THE ARCUS PILOT reports that they were in a cruise between thermals at approximately 3900ft agl when the Cessna appeared from their starboard side and crossed just in front of them in a right-hand climbing turn - they think [they were taking] avoiding action. Although there were two persons in the glider, they did not see the Cessna until they were just off their right-hand side, as they appeared from behind and beneath their starboard wing. It is their belief that the Cessna [pilot] only saw them at the last minute and took avoiding action by entering a climb and a turn onto their heading. The aircraft was so close that they could identify it as a Cessna 150/152, and could read its registration very easily. They logged the Airprox with Doncaster [Approach] on 126.225MHz within a few minutes of the event.

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

THE C150 PILOT reports that they were completing general handling exercises, focusing on trimming and straight and level flight. It was quite likely that they were patterning to the student at this phase.

THE GAMSTON AIRPORT MANGER reports that [a review had taken place] with the airport communications staff on duty that day. No report was filled as this event did not occur within Gamston's ATZ. Gamston does not record its RT.

Factual Background

The weather at Doncaster was recorded as follows:

METAR EGCN 271150Z 10005KT 040V170 9999 FEW043 21/10 Q1021
 METAR EGCN 271220Z 08004KT 350V150 9999 FEW042 22/10 Q1021

Analysis and Investigation

UKAB Secretariat

An analysis of the NATS radar replay was undertaken and both aircraft were detected – they were identified with cross-reference to their respective pilot reports and with the assistance of the Radar Analysis Cell. The radar displayed the elevation of the C150 as a flight level; due to the pressure setting on the day, 200ft should be added to the flight level to convert it to an altitude. The altitude of the Arcus has been extracted from the GPS data supplied by the pilot.

In the lead-up to the Airprox both aircraft were maintaining a relatively straight and level flightpath with the C150 to the west of the Arcus, tracking in the opposite direction to it. Approximately 12sec before the Airprox, the C150 pilot commenced a slight turn to their right. At 1159:42, one radar sweep before radar CPA, with the aircraft separated by 0.1NM, the C150 pilot increased their rate of turn, Figure 1.

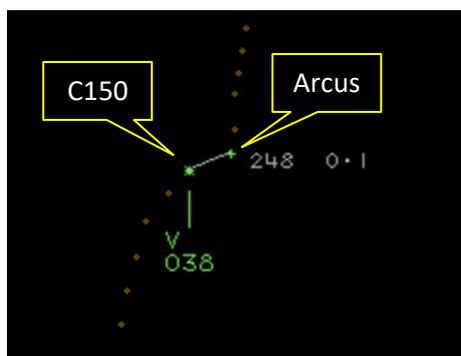


Figure 1 – 1159:42

The C150 then passed in front of the Arcus and, on the next radar sweep, at 1159:46, was detected to the east of the Arcus, Figure 2.

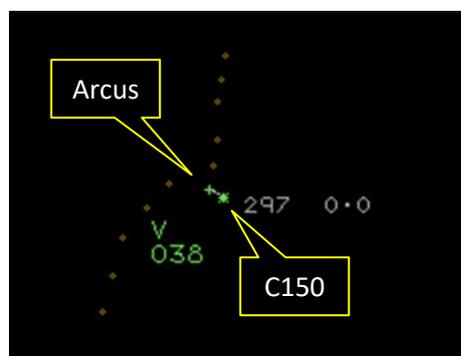


Figure 2 – 1159:46. Radar CPA

At radar CPA, horizontal separation has been measured directly from the radar as less than 0.1NM, however, due to the necessity to combine radar and GPS data to measure the vertical separation, this has been recorded as an approximation. Actual CPA occurred between radar sweeps at approximately 1159:45.

As stated in the Arcus pilot's narrative, shortly after the Airprox they called Doncaster Sheffield ATSU to report the event. The UKAB Secretariat contacted Doncaster Sheffield who kindly provided a transcript of the exchange. Over the period covered by the transcript, there were exchanges between the controller and other aircraft which have been removed from the transcript in the interest of brevity. The Arcus pilot first made contact with Doncaster Sheffield at 1205:09.

| Time | Agency | Narrative |
|----------------------|--------------|---|
| 12:05:09 | Arcus glider | Doncaster Approach, [glider c/s], message. |
| 12:05:14 | DSA Radar | [Glider c/s] Doncaster Radar good afternoon, pass your message. |
| 12:05:23 | Arcus glider | Doncaster Approach, [glider c/s], message. |
| 12:05:27 | DSA Radar | [Glider c/s], pass your message. |
| 12:05:30 | Arcus glider | Er, just to let you know that we've had a very close Airprox with a Cessna. I think it was an Aerobat, [redacted elements of C150 reg], er, sorry, [redacted elements of C150 reg]... er, just one second... |
| 12:05:57 to 12:06:57 | | *Exchanges with other aircraft take place* |
| 12:07:01 | DSA Radar | [Glider c/s], did you get that callsign? |
| 12:07:02 | Arcus glider | Did sir, did sir, it's er... |
| 12:07:10 | | *Unreadable message from another pilot* |
| 12:07:17 | Arcus glider | Er, he came from behind our wing but he did actually take avoiding action but it was quite clearly imminent risk, so I would like to log it and we'll make a report when we land back at [destination airfield] this afternoon. |
| 12:07:28 | DSA Radar | Roger [glider c/s], that's understood. |
| 12:07:31 | Arcus glider | Thank you. |

The Arcus and C150 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 If the incident geometry is considered as converging then the C150 pilot was required to give way to the Arcus.³

Comments

AOPA

In the interests of flight safety, it is important to report Airprox on an ATC frequency as this aids production of lessons to be learned if any party is requested to participate in the investigation and helps to give a full recollection of the flight. It is important to have an effective lookout before turning and when in the cruise to the next thermal. Whilst instructing, it is important that pilots do not become task focussed whilst pattering an exercise.

It is accepted it is difficult to spot gliders when head on, this is a good example of where appropriate EC could assist pilots.

BGA

With no interoperable Electronic Conspicuity between the two aircraft, and neither in receipt of an ATS, the only active barrier to MAC was see-and-avoid, which unfortunately was not effective in this case.

Summary

An Airprox was reported when an Arcus and a C150 flew into proximity 2.5NM south-southwest of Gainsborough at 1200Z on Saturday 27th August 2022. Both pilots were operating under VFR in VMC, neither pilot in receipt of an ATS.

¹ (UK) SERA.3205 Proximity.

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

³ (UK) SERA.3210 Right-of-way (c)(2) Converging.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from both pilots, a GPS data file 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 considered the actions of the Arcus pilot and noted that the EC equipment that they had been carrying was of a type commonly used by glider pilots, which had been unable to detect, and had therefore been incompatible with, the transponder carried by the C150 pilot (**CF2**). The Board then discussed whether the Arcus pilot had had any prior knowledge of the presence of the C150 and members agreed that, as they had not been in receipt of an Air Traffic Service, and without an EC alert, the Arcus pilot would have had none (**CF1**). A glider pilot member highlighted that the weather report for Doncaster at the time had listed clouds at 4300ft, meaning that the Arcus pilot had been at, or close to, the cloudbase at the time of the event. They went on to inform the Board that they had been able to establish that shortly before the event the Arcus pilot had turned at a waypoint and when the Airprox occurred they had been close to commencing their next thermalling climb, which would have meant that their workload would have been relatively high. Members agreed that the Arcus pilot's workload may have contributed to them having not visually acquired the C150 until after it had appeared beneath them, after CPA (**CF3**). Members had been especially encouraged that the Arcus pilot had called Doncaster Approach to report the Airprox. The Board valued the information provided by Doncaster ATSU and wished to express its thanks to the unit for their contribution.

Next, members discussed the actions of the C150 pilot and a GA pilot member, who is also a flight instructor, stated that although 'pattering' an exercise is an important factor in delivering effective instruction, it must not be allowed to interfere with the normal procedures of flight management and lookout. The Board acknowledged that gliders can be difficult to visually acquire and noted the proximity of the Arcus to the reported cloudbase, agreeing that it had been likely that these factors had contributed to the C150 pilot not visually acquiring it (**CF3**). Members discussed that the C150 pilot had not had any EC equipment with them at the time of the event. The Board agreed that it is for individual airspace users to decide what their requirements are regarding EC equipment however, members would encourage the pilots of training flights to utilise every opportunity to enhance their situational awareness, and the Board wished to highlight to pilots that additional funding has been made available for Electronic Conspicuity devices through the CAA's Electronic Conspicuity Rebate Scheme, which has been extended until 31st March 2023.⁴ The Board agreed that without any EC equipment, and having not been in receipt of an Air Traffic Service, the C150 pilot had not had any mechanism to build awareness of the presence of other airspace users and as such had not had any awareness of the presence of the Arcus (**CF1**).

Finally, in assessing the risk of collision, the Board noted that the EC equipment carried by the Arcus pilot had been unable to detect the C150. Members agreed that neither pilot had had any prior situational awareness regarding the presence of the other aircraft and, although the Arcus pilot had become visual with the C150, it had been at or after CPA, whereas the C150 pilot had not become visual with the Arcus at any point. The Board concluded that providence had played a major part in events, that the separation that had existed had been fortuitous and the bare minimum, and that there had been a serious risk of collision (**CF4**). As such, the Board assigned a Risk Category A to this Airprox.

⁴ [Electronic conspicuity devices | Civil Aviation Authority \(caa.co.uk\)](https://www.caa.co.uk/electronic-conspicuity-devices)

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK**Contributory Factors:**

| 2022198 | | | | |
|---|---------------|--|--|---|
| CF | Factor | Description | ECCAIRS Amplification | UKAB Amplification |
| Flight Elements | | | | |
| • Situational Awareness of the Conflicting Aircraft and Action | | | | |
| 1 | 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 | | | | |
| 2 | Technical | • ACAS/TCAS System Failure | An event involving the system which provides information to determine aircraft position and is primarily independent of ground installations | Incompatible CWS equipment |
| • See and Avoid | | | | |
| 3 | Human Factors | • Monitoring of Other Aircraft | Events involving flight crew not fully monitoring another aircraft | Non-sighting or effectively a non-sighting by one or both pilots |
| • Outcome Events | | | | |
| 4 | 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: A

Safety Barrier Assessment⁵

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

Situational Awareness of the Conflicting Aircraft and Action were assessed as **ineffective** because neither pilot had had any prior awareness of the presence of the other aircraft.

Electronic Warning System Operation and Compliance were assessed as **ineffective** because the EC equipment carried by the Arcus pilot had been incompatible with, and therefore unable to detect, the transponder on the C150.

See and Avoid were assessed as **ineffective** because, although the Arcus pilot had become visual with the C150, this had been at or shortly after CPA, and the C150 pilot had not visually acquired the Arcus at any point.

⁵ 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: 2022198 | | 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 | ■ | ■ | ■ | ■ | □ | | | |