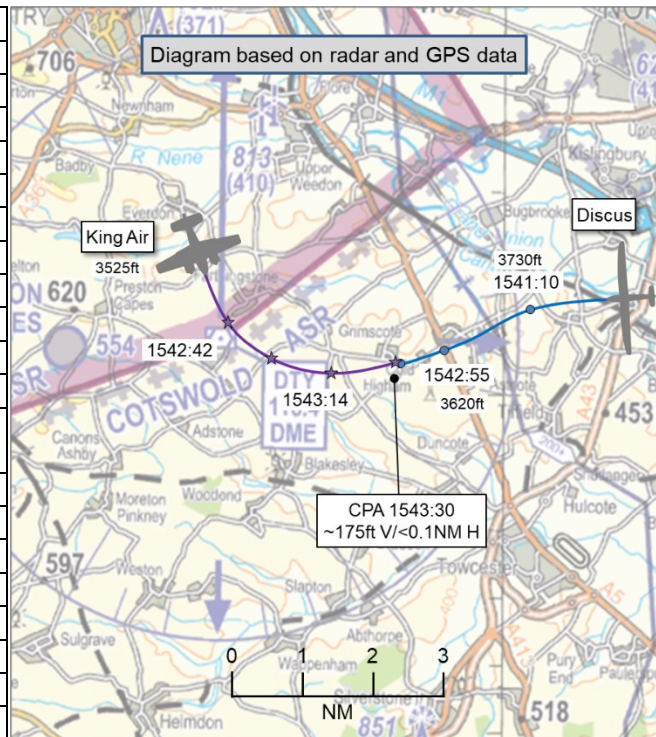


AIRPROX REPORT No 2024181

Date: 02 Aug 2024 Time: 1543Z Position: 5210N 00102W Location: IVO Grimscote

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	Discus	King Air
Operator	Civ Gld	Civ Comm
Airspace	London FIR	London FIR
Class	G	G
Rules	VFR	VFR
Service	None	Basic
Provider	N/A	Cranfield
Altitude/FL	3350ft	3525ft
Transponder	Not fitted	A, C, S
Reported		
Colours	White	White
Lighting	None	Nav, strobes, recognition
Conditions	VMC	VMC
Visibility	>10km	>10km
Altitude/FL	3500ft	3500ft
Altimeter	QNH	QNH (1011hPa)
Heading	~260°	090°
Speed	50kt	180kt
ACAS/TAS	PowerFLARM	SkyEcho
Alert	None	None
Separation at CPA		
Reported	30ft V/0NM H	Not seen
Recorded	~175ft V/<0.1NM H	



THE DISCUS PILOT reports that after having turned at Northampton [to head southwest] they had started their return leg to [destination airfield] seeking lift from the decaying cumulus clouds ahead of them looking to maintain altitude as far as possible. Their focus was very much outside the cockpit and they had not been distracted by anything inside the cockpit, which included the instruments. They had been looking to find a path ahead with the most promising looking sources of lift. Their main scan had at that time been +/- 45° ahead of them as they had proceeded on a course of approximately 260°. They made visual contact with a very fast moving twin-engined aircraft that had been following more or less a reciprocal path from their own but at greater speed and at their altitude. [They recall that] they had little time to react (maybe <3sec to contact) but quickly judged that it would be dangerous to break right as the roll rate of the glider may not have been quick enough and that would also place the other aircraft into their blind spot. The Discus pilot opted to make a steep dive to pass underneath the King Air, maintaining visual contact throughout, which had then passed directly overhead with less than 50ft difference in altitude between them. The Discus pilot states that they were not sure why they hadn't spotted the King Air earlier but mitigating factors may have been slightly poor visibility/haze and [that they had been] flying west towards the sun, but it was by no means a setting sun (about 4.45pm local time). They believe that the main reason for the late sighting of the King Air had been because of the high speed that it had been flying and that they had been at the same altitude on reciprocal tracks that had made the aircraft silhouette/outline small. The Discus pilot had not seen any flashing lights. Having [subsequently] spoken to the other pilot, the Discus pilot can confirm that the King Air pilot had not seen them at all. The Discus pilot opined that had they not taken evasive action then they are certain there would have been a mid-air collision.

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

THE KING AIR PILOT reports that they had been on a training flight as P1 in the left-hand seat and the trainee in the right-hand seat operating as the multi-crew handling pilot. They also had a 'safety pilot' on board monitoring their iPad using [electronic conspicuity equipment] as there is no TAS installed on the aircraft. The plan had been to fly to Cranfield and carry out 6 circuits as a completion of the trainee's base training. [They aimed to] leave [departure airfield] CAS to the south from a RW27 departure and route to Cranfield at A3500 via DTY. This had aimed to keep them clear of a gliding competition which had been NOTAM'd at Husbands Bosworth. They had maintained a Traffic Service with East Midlands until before DTY and had then made contact with Cranfield, reporting overhead DTY, being given a Basic Service and asked to route via OLNEY. The [reported] Airprox had occurred shortly after or possibly during that R/T exchange. For the event itself, the King Air crew had not seen the other aircraft or had any warning about it. The first they had known about it had been following contact from the glider pilot after the event. The rest of the sortie had been uneventful. The importance of maintaining a good lookout for this VFR flight had been covered during the pre-flight briefing, the flight itself and the post flight-debrief.

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

THE CRANFIELD CONTROLLER reports that they had been forwarded an email from the Airprox Board by their SATCO, notifying an Airprox involving a King Air and a glider on 2nd August at 1543. The King Air had been inbound for circuits, and had been on the frequency. From their memory, no gliders were on the frequency in that area, and the Airprox had not been mentioned by the King Air pilot.

Factual Background

The weather at Cranfield and Birmingham Airport was recorded as follows:

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METAR EGTC 021620Z NIL=  
METAR EGBB 021620Z 23008KT 180V270 9999 SCT048 23/14 Q1011=
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Analysis and Investigation

CAA ATSI

ATSI have nothing to add to the review by Cranfield. Their controller would not have been aware of the presence of the glider and so [would have been] unable to pass Traffic Information.

CRANFIELD

The Cranfield SATCO had listened to R/T recordings for +/- 10min [around the reported time of the event] and had watched playback of a FID unit on test in the tower. They had [also] checked Flight Progress Strips for a period of +/-15min. No gliders were noted on frequency [...].

UKAB Secretariat

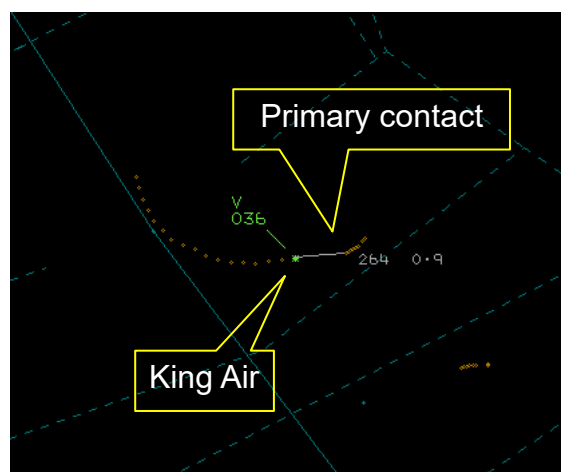


Figure 1: At CPA (1543:30): The King Air had been at 3550ft and the last point at which an aircraft (which cannot be confirmed as the Discus) had shown as a primary radar contact (1543:06). Following the radar replay through for a further minute (1544:26), the primary contact did not reappear.

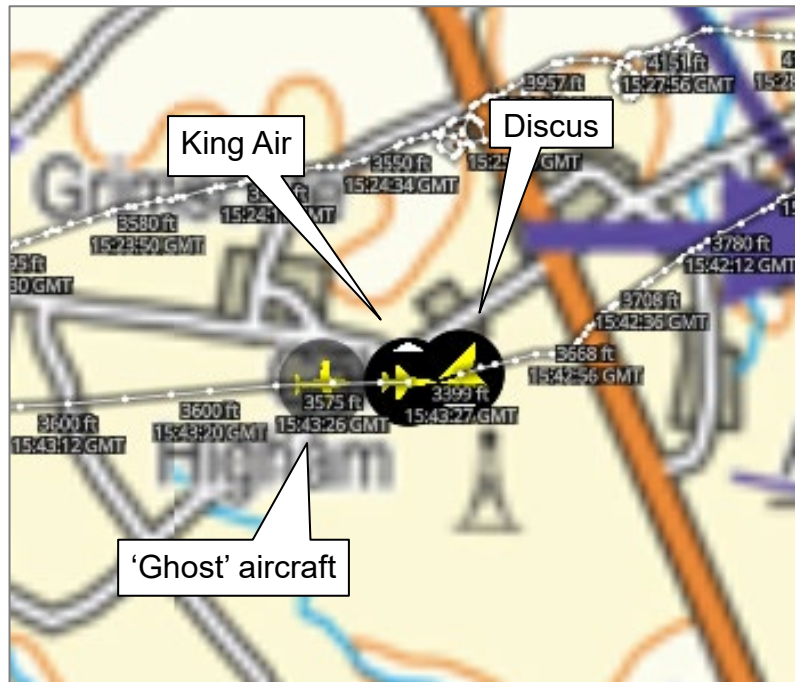


Figure 2: (Taken from the CAA's Airspace Analyser Tool) The Discus is timed at 1543:27 and passing 3350ft descending rapidly. The King Air is timed at 1543:30 and passing 3575ft climbing.

The King Air was tracked throughout using Mode S radar whereas the Discus appeared intermittently on that system and only as a primary contact. Both aircraft were tracked via the CAAs Airspace Analyser Tool and the picture at page 1 is drawn together using both radar and GPS data sources. Reference to the 'ghost' aircraft at figure 2 was clarified by the crew of the King Air as the operator's SOPs requiring a safety pilot on board for the type of training flight [in this case]. One of their pilots in the back of the King Air had carried an iPad and had been using an [electronic conspicuity equipment]. Although unaware at the time, they now believed this to have been registered to a different aircraft, hence the 'ghost' return.

The Discus and King Air 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

Comments

AOPA

As this Airprox ably demonstrates, even with electronic conspicuity, lookout has to be effective. A timely reminder that a glider head-on is very difficult to spot and that an aircraft in a turn has angle profile which can make it easier to see if lookout is effective.

BGA

The carry-on CAP 1391 ADSB-based TAS on board the King Air can also be configured to receive transmissions from the EC equipment carried by almost all gliders (including this Discus) and display nearby glider traffic via participating EFB applications. Using this option would provide a useful

¹ (UK) SERA.3205 Proximity.

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

additional safety barrier in airspace where gliders operate. The EC equipment fitted to the Discus (and in fact almost all gliders) warns of impending conflicts with other similarly-equipped aircraft. This system mitigates the risk of Airprox with other gliders, but basic installations do not detect aircraft equipped only with a transponder or a CAP 1391 ADSB-out device, as the King Air was in this case. However, recent versions of this EC equipment can optionally include a 1090MHz receiver subsystem, and thereby warn of conflicts with transponder and ADSB-out-equipped aircraft. Updating glider EC hardware to add such a 1090MHz receiver subsystem would provide a useful additional safety barrier in airspace with a high density of transponder or ADSB-out equipped aircraft.

Summary

An Airprox was reported when a Discus and a King Air flew into proximity in the vicinity of Grimscote at 1543Z on Friday 2nd August 2024. Both pilots were operating under VFR in VMC, the Discus pilot had not been in receipt of an Air Traffic Service and the King Air pilot had been in receipt of a Basic Service from Cranfield.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from both pilots, radar photographs/video recordings, GPS data and reports from the air traffic controllers involved. 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 Discus pilot, noting the phase of their flight and their operation without radio or transponder. Members opined that although the Discus pilot had carried electronic conspicuity equipment common to the gliding fleet, this model had not been capable of detecting the electronic conspicuity equipment carried and used by a high proportion of larger powered GA operators (**CF3**) rendering the EWS barrier ineffective in this case. As the Discus pilot had reported not being in receipt of an Air Traffic Service, they had not made situational and information calls but may have been able to receive such if radio equipped. The Board agreed that the Discus pilot had not had any situational awareness of the presence of the King Air (**CF2**). Members noted that the Discus pilot described having visually acquired the King Air at a late stage (**CF4**) and had had little time to react but had done so.

In reviewing the actions of the King Air pilot, members noted the nature of their flight, the use of additional crew for safety tasks, the carriage and use of electronic conspicuity equipment, which in this case had unfortunately been incompatible with that carried by the Discus (**CF3**), and that they had been in receipt of a Basic Service from Cranfield. Members noted that the declared IAS at the time of the event had been relatively low for this aircraft and may have been an additional measure in reducing risk. They also noted that the aircraft had been equipped with a suite of lighting options to improve their visual conspicuity to others. However, as the King Air crew had had no electronic alerts of other traffic, nor heard any radio calls, they had not had any situational awareness of the presence of the Discus (**CF2**) and had, in fact, not sighted the Discus at any stage (**CF5**).

Turning to the role played by the Cranfield controller, they noted the reports from both the controller and the operating authority and that neither had been aware of glider operations in the area and that, as the glider had not been operating with a radio or transponder, they would likely not have been aware of its presence. As the King Air pilot had been in receipt of a Basic Service, the Board agreed that there had been no requirement for the flight to have been monitored by the controller (**CF1**).

Concluding their discussion, members agreed that neither of the pilots had had any situational awareness of the presence of the other aircraft. The pilot of the King Air had not sighted the Discus and the pilot of the Discus had sighted the King Air only at the moment of CPA. Members agreed that the separation between the Discus and King Air had been such that the safety of the aircraft had not been assured and that there had been a risk of collision (**CF6**). The Board assigned Risk Category B to this event.

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

	2024181			
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				
• Situational Awareness of the Conflicting Aircraft and Action				
2	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				
3	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				
4	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
5	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				
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 Assessment³

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 there was no requirement for the Cranfield controller to have monitored the flight under a Basic Service.

Flight Elements:

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

Electronic Warning System Operation and Compliance were assessed as **ineffective** because the electronic conspicuity equipment carried by both pilots was incompatible with that carried by the other.

See and Avoid were assessed as **partially effective** because the King Air pilot did not see the Discus and the Discus pilot achieved only a late sighting of the King Air.

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: 2024181		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 Conflicition & 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:		<u>Full</u>	<u>Partial</u>	<u>None</u>	<u>Not Present/Not Assessable</u>	<u>Not Used</u>	
Provision	✓	⚠	✗	●			
Application	✓	⚠	✗	●		○	
Effectiveness							