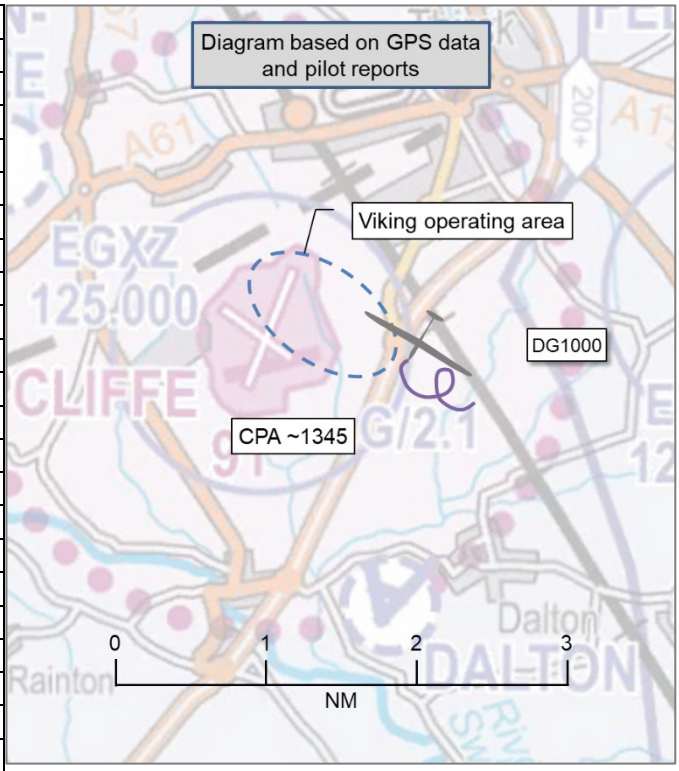
AIRPROX REPORT No 2024114

Date: 08 Jun 2024 Time: ~1345Z Position: 5412N 00121W Location: 1NM ESE RAF Topcliffe

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	Viking	DG1000
Operator	HQ Air (Trg)	Civ Gld
Airspace	Topcliffe MATZ	London FIR
Class	G	G
Rules	VFR	VFR
Service	MAGCS	None
Provider	Topcliffe	N/A
Altitude/FL	NK	~3200ft
Transponder	Not fitted	Not fitted
Reported		
Colours	White	White
Lighting	Not fitted	Not fitted
Conditions	VMC	VMC
Visibility	>10km	>10km
Altitude/FL	3000ft	NK
Altimeter	NK (NK hPa)	QNH (NK hPa)
Heading	'turning'	'circling'
Speed	NK	NK
ACAS/TAS	FLARM	FLARM
Alert	Alert	Information
Separation at CPA		
Reported	'unknown'	NR
Recorded	NR	



THE VIKING INSTRUCTOR reports their second launch and task of the day. Conditions were excellent for soaring and the weather was CAVOK. After winch-launching up to 1300ft AAL they found a strong thermal, centred in it and were quickly climbing well. The passenger was a first time flyer. Given the thermic conditions and the thermal turning, they were mindful of their welfare. They had already had one airsick passenger that day, but this passenger was doing well and enjoying the experience. They maintained a robust LAIF work-cycle in the manoeuvring. The thermal had opened up nicely, making it easy to fly and allowing a stable 30° AOB turn to be maintained. This made the workload of monitoring the cadet whilst maintaining air sense quite comfortable. Approximately 2NM south-southeast from Topcliffe, approaching 3000ft AAL, they recalled they had just completed a lookout and glanced in to the variometer; the aircraft was still climbing very well. The [common glider TAS] rapid warning chime sounded and they immediately looked at the display. Seeing the RED indications showing straight ahead they realised they should have been looking straight ahead, not at the display! They looked up and ahead, seeing nothing they looked into the immediate turn direction. Again, nothing seen. They quickly decided that as they could not see the intruder, it would be safer to continue the turn maintaining a predictable trajectory if the [pilot of the] other aircraft could see them, and to continue altering their course away. They looked back to the [common glider TAS] display, it was showing the contact in the 7 o'clock position and above. Reassured by this, they wanted to make visual contact and continued the turn. They planned to be visual with the aircraft in their 3 o'clock heading west otherwise they would exit the turn, By the 4 o'clock position they had a good visual on the conflict. It appeared to be a high performance white civilian glider routeing in an approximately southerly direction slightly below. At no point in any of their lookout turns had they seen other aircraft near.

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

THE DG1000 PILOT reports they had a [common glider TAS] warning over RAF Topcliffe. Since they did not consider it a problem at the time they no longer remembered very clearly what happened. They

were thermalling and aware of gliding activity in the area. A glider was nearby but not in their thermal. At some point there was a brief warning buzz from the [common glider TAS]. They were both turning and they suspect that the [common glider TAS] had projected straight line courses with a risk of collision. They took no action and did not remember the other glider doing anything unusual.

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

THE MILITARY A/G OPERATOR did not submit a report.

Factual Background

The weather at Topcliffe was recorded as follows:

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METAR EGXZ 081350Z AUTO 30014KT 9999 OVC053/// 16/04 Q1010=
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Analysis and Investigation

UKAB Secretariat

The Viking and DG1000 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]

RAF Topcliffe Occurrence Investigation

The RAF Topcliffe Occurrence Investigation found the following outcome, cause and causal factor:

Outcome: Airprox between a military glider and a civilian glider.

Cause: The military pilot was unaware that the civilian glider was in the area until they were alerted by the [common glider TAS] system.

Causal Factor: The civilian pilot did not notify the VGS DS, either by phone or radio, of their intent to fly over and in the proximity of RAF Topcliffe.

Observations: The area around RAF Topcliffe is Class G airspace and there is no regulatory requirement for pilots to communicate with each other.

The Viking has both FLARM and ADS-B out as EC mitigation.

Comments

HQ Air Command

This was subject to a Local Investigation. The pilots had no prior situational awareness of each other until the electronic conspicuity equipment alerted the Viking pilot that another aircraft was close by. Still not visual, the Viking pilot adopted a sensible course of action and eventually gained visual after CPA. The Viking Safety Team have worked hard to ensure electronic visibility through ADS-B out and FLARM and it is good to see that it was effective in this incident.

BGA

The EC units fitted to almost all UK gliders (including both gliders in this report) use GPS to find their own 3-dimensional position and predicted flight path, and transmit this information (along with a unique identifier) at one-second intervals at low power on an unregulated waveband. Compatible EC units carried by other aircraft within 3-5km that receive these data packets compare them to their own predicted flight paths, and if they determine that the two aircraft may come dangerously

[1] (UK) SERA.3205 Proximity. MAA RA 2307 paragraphs 1 and 2.

close in the near future, issue in-cockpit audio and visual warnings. The first warning level (audio tone and one flashing red direction indicator) indicates a possible conflict in 19-25sec; Level 2 (higher pitched tone, two flashing red direction indicators) gives 14-18sec warning, and Level 3 (audio tone and 3 flashing red direction indicators) gives 6-8sec warning. However, if the next data packet received (usually one second later) no longer indicates a conflict, then the warning will immediately cease.

Experience shows that two gliders manoeuvring as much as 600m apart at typical thermalling airspeeds of 45-50kt (23-26m/s) may trigger occasional, brief, transient Level 1 conflict alerts if they happen to be co-altitude and momentarily tracking towards each other. However, if one or both gliders continue turning, such transient alerts cease after one second as the EC units detect that the flight paths are no longer converging. Thereafter the EC unit cockpit display may continue to indicate the bearing of the other aircraft relative to track with a single green directional indicator.

It's important to appreciate that these EC cockpit displays show the direction of the detected aircraft relative to one's own TRACK, not HEADING. Although winds at 3000ft AMSL during this incident are not recorded, the Teesside reported surface winds of 280°/16kt suggest 3000ft winds from about 310° at speeds of at least 25kt. Under these conditions the track of a glider thermalling at 45kt will differ from its heading by up to 30° over the course of each complete 360° turn. Hence an EC warning of a threat "straight ahead" could be triggered by another aircraft between 11 o'clock and 1 o'clock relative to heading, and responding to a "straight ahead" indication by looking straight ahead relative to one's own aircraft (i.e. 12 o'clock) may not lead to the other aircraft being sighted. In very strong winds, track and heading may differ by up to 180°, so that a "straight ahead" warning could theoretically be triggered by an aircraft at 6 o'clock. The BGA therefore suggests that pilots using the EC units fitted to almost all UK gliders should ideally NOT respond to any conflict alerts based only on what they see on the in-cockpit display, but, if possible, look all around to visually identify the threat before manoeuvring.

Summary

An Airprox was reported when a Viking and a DG1000 flew into proximity near RAF Topcliffe at about 1345Z on Saturday 8th June 2024. Both pilots were operating under VFR in VMC, the Viking pilot in receipt of a MAGCS from Topcliffe and the DG1000 pilot not in receipt of a FIS.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from both pilots, radar photographs/video recordings, GPS data, 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 Viking did not appear on NATS Ltd radar replay and a GPS track log was not supplied. Internet-based flight tracking apps showed, variously, no sign of the Viking, the Viking in the vicinity of Topcliffe and an aircraft with a different registration at the position and time reported. It was considered that there was sufficient ambiguity as to the position of the Viking that it was not possible to make an estimation of separation at CPA. The Board therefore concluded that insufficient information was available to determine the risk involved, or inconclusive or conflicting evidence precluded such determination, Risk D, with the following contributory factors:

CF1: Neither pilot had situational awareness of the other approaching aircraft.

CF2: The Viking pilot was concerned by the proximity of the DG1000.

CF3: Both pilots received information from their [common glider EC/TAS].

CF4: The Viking pilot did not see the DG1000 until at about CPA, or shortly thereafter.

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

Contributory Factors:

	2024114			
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
2	Human Factors	• Unnecessary Action	~~Events involving flight crew performing an action that was not required~~	Pilot was concerned by the proximity of the other aircraft
	• Electronic Warning System Operation and Compliance			
3	Contextual	• Other warning system operation	An event involving a genuine warning from an airborne system other than TCAS.	
	• See and Avoid			
4	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

Degree of Risk: D.

Safety Barrier Assessment[2]

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

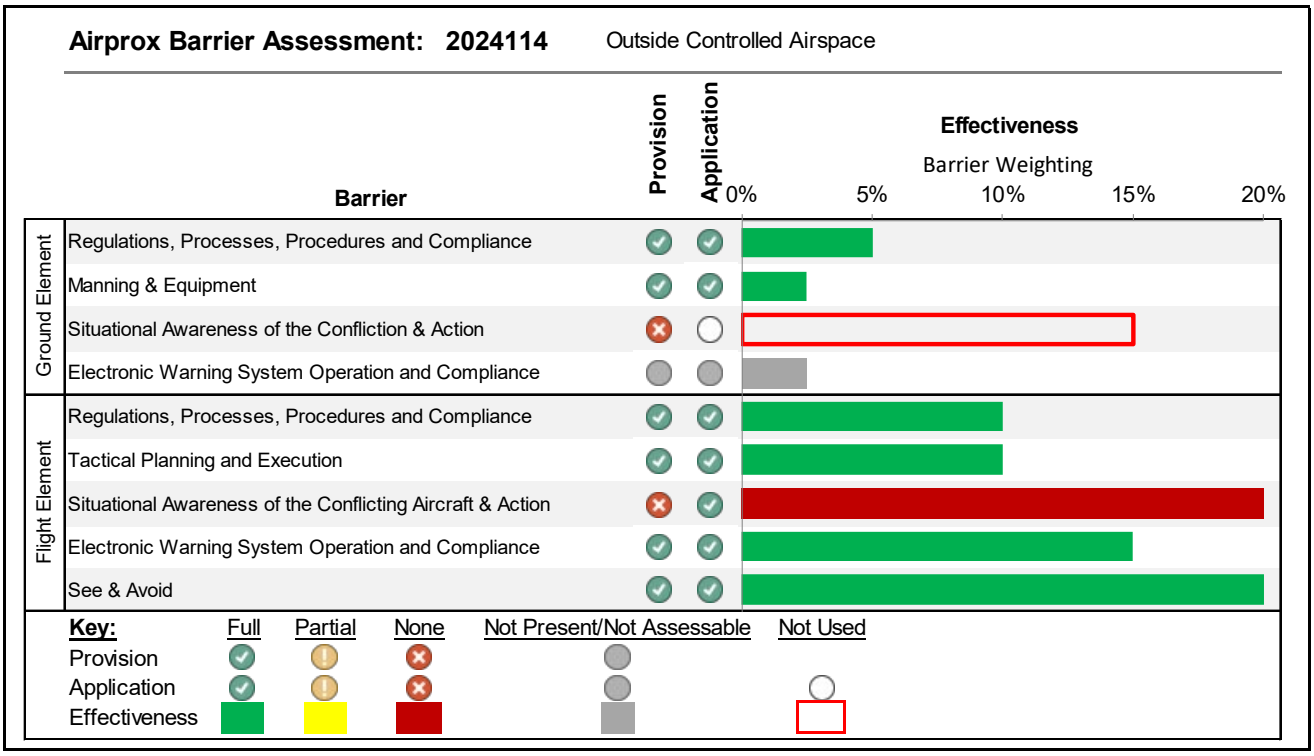
Ground Elements:

Situational Awareness of the Confliction and Action were assessed as **not used** because the MAGCS Operator was not required to maintain situational awareness of aircraft positions and tracks.

Flight Elements:

Situational Awareness of the Conflicting Aircraft and Action were assessed as **ineffective** because neither pilot was aware of the proximity of the other aircraft until their [common glider EC/TAS] alerted.

[2] 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: 2024114
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