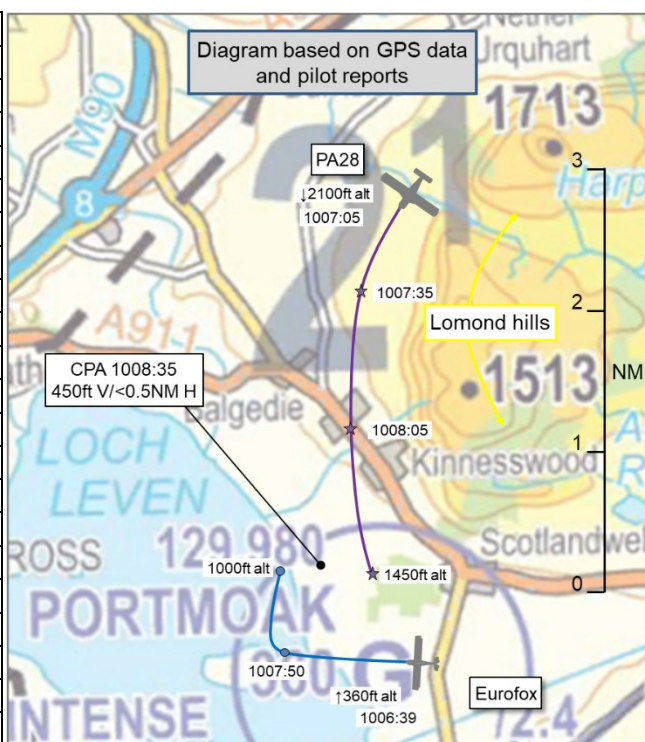


AIRPROX REPORT No 2023206

Date: 04 Sep 2023 Time: 1009Z Position: 5612N 00320W Location: 1NM North of Portmoak

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	Eurofox	PA28
Operator	Civ FW	Civ FW
Airspace	Scottish FIR	Scottish FIR
Class	G	G
Rules	VFR	VFR
Service	Listening Out	Listening Out
Provider	Portmoak	Fife
Altitude/FL	1000ft	1450ft
Transponder	A, C, S	A, C, S
Reported		
Colours	Yellow and Black	White and Blue
Lighting	Strobes, Position	Anti-collision
Conditions	VMC	VMC
Visibility	>10km	>10km
Altitude/FL	1000ft	1500ft
Altimeter	QFE	QNH (1021hPa)
Heading	300°	120°
Speed	65kt	120kt
ACAS/TAS	PowerFLARM	SkyEcho
Alert	None	Information
Separation at CPA		
Reported	0ft V/0.5NM H	~460ft V/'quite close' H
Recorded	450ft V/0.5NM H	



THE EUROFOX PILOT reports that they had been in combination with a glider towing out to the west, climbing through 1000ft on QFE when they had spotted a PA28 off their right wing at the same height. It had been incredibly close to the hill where local soaring had been taking place. At that time the Eurofox pilot believed that there had been 4 gliders soaring on the southwest facing side of Bishop Hill. The pilot had been concerned that the PA28 would have flown directly over the field so they had called out on frequency to advise and pause launching for the time being. The Eurofox pilot believed that the PA28 had been descending into [...] and had had no idea that [the Eurofox] had been there.

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

THE PA28 PILOT reports that during a flight from [departure aerodrome] to Fife they had unintentionally passed close to Portmoak airfield at around 1500ft. The flight had been planned as IFR out of [departure aerodrome], with a VFR approach to Fife. The filed route had been [supported by a back-up weather option]. The weather had been relevant to their decision making as they had approached the area. From preflight study of nearby TAFs, a layer of cloud had been expected during the descent. [Pilot's commentary on anticipated weather conditions]. A key decision that the pilot had decided to defer until the flight had been how to manage the descent past the Lomond hills (up to 1713ft) on the approach to Fife, with two options considered in advance. The IFR default had been to continue past the hills at or above MSA (3100ft) and then descend to the south of Fife – as far as the coast if necessary – before returning to the field VFR. Alternatively, if it had turned out to be possible to descend in continuous VMC, they would have descended VFR to the east of the Lomond Hills. The IFR section had been flown in VMC with good visibility and almost no cloud for a beautiful flight over the Grampians, albeit with some mountain wave during the climb. Towards the end of the IFR segment the pilot had started a descent from FL70 to 3000ft with a Traffic Service from Leuchars Radar, with the possibility in mind of stopping the descent at 3100ft if needed.

As the pilot had been passing Perth at around 5000ft they had seen a more-or-less continuous layer of cloud (certainly more than "FEW") stretching from left to right and above the Lomond Hills. It had been possible to see under the clouds and the pilot had decided that they could continue the descent VFR to the east of the Lomond Hills. As the descent had continued, turbulence increased and the pilot had started to doubt that the wind had reduced as much as forecast. They had then decided that they didn't want to be downwind of a rotor to the east of the hills ahead. Looking to the west they thought they could pass to that side since the clouds ahead had seemed well above the Lomond Hills. At about 8 or 9NM north of Fife the pilot had left Leuchars and changed to Fife (making blind calls). They had continued VFR with parting advice from the Leuchars controller to lookout for gliders. Though it had not been on their planned route, from their pre-flight planning they had recalled unlicensed fields to the west of the Lomond hills, though hadn't studied them in detail and had not included them in the plan. Still, from what they could see initially, they had hoped to pass through at around 2500ft. The pilot recalled that their main focus had been on terrain, cloudbase and looking out for airborne gliders near the hill and at this point they had not paid sufficient attention to the airfields on the ground ahead. As they had continued to the south the cloudbase had lowered more than they had hoped. They descended with it, eventually down to 1500ft to get under one particular cloud – they estimate that this had had a base of around 1600ft since it had obscured their view of the top of the hill to the left. During this descent they had seen a SkyDemon ADS-B report (from their electronic conspicuity (EC) equipment) of a powered aircraft about 1400ft below them. It had been flying west out of Portmoak which had made the pilot realise that they had been about to fly much closer to the field than they should have – indeed had already been doing so. The pilot reports that they normally try to observe an imaginary ATZ around unlicensed fields and had clearly been failing to observe that at the time.

The pilot had briefly considered their options - turning west could have increased the risk of conflict with the Portmoak climb-out path and the aircraft flying west; turning east had not been possible due to the hills and the pilot had been reluctant to climb into cloud, especially as they had wanted to keep a lookout for gliders. Since the powered aircraft had been flying west they considered that the risk of conflict had been lower and that their best option had been to continue southeast and note their mistake for future avoidance. The pilot had briefly considered giving Portmoak a call but it had not been in their list of prepared PLOG frequencies and hadn't wanted to put their head in the cockpit at this busy moment to look it up. After a while they realised that the powered aircraft had turned and had been flying parallel with them to their right on a southerly [they report] track, still climbing. The PA28 pilot did not recall the exact height difference but believes it to have been around 1000ft below. After that they had seen that the aircraft had changed direction again and had now been flying towards them as if downwind in a left hand circuit flying from west to east. Later it had passed behind them. Just after it had passed behind them they had seen a last ADS-B altitude difference in the high 400s below, either 460ft or 480ft. The PA28 pilot considered that the potential for conflict had passed and had turned their attention back to looking for gliders and for Fife [the destination] airfield. In terms of their priorities, they believed that they had probably had more of their attention looking for gliders than on the powered aircraft throughout the time they had been monitoring it, since they could see an ADS-B position and direction and felt that gliders had greater potential for unexpected risk.

The PA28 pilot reports that they had not seen the powered aircraft visually at any point, since it was below them and mostly to their right, while they had been in the left hand seat. Therefore their account depended entirely on the accuracy of the reported altitude differences which they cannot confirm with a visual sighting. They also understood that they had been flying a little to the east of the airfield when their passenger, looking out of the right window, commented on gliders that they could see on the ground below through the right-hand window. They had not seen them from the left seat. Soon after passing the powered aircraft there had been a second indication on SkyDemon. This had been an EC indication of a glider at 0.2NM. Looking behind in the indicated direction the pilot had seen a glider in their 8 o'clock. It had been above them and above the hill positioned to the east and above the cloud that they had just flown under. It had looked visually small at a distance and they had wondered if the distance had in fact been more than 0.2NM though they could not claim to accurately judge distances in the air. This thought had caused them to wonder if the glider they had been looking at had actually been the one indicated or if there had been another closer that they hadn't seen. However, they did not recall having seen another glider and judged that there had been no conflict with the glider that they

had seen. The indication disappeared from the screen shortly thereafter and the PA28 pilot reported that they had continued to land.

Comments after the flight

That evening the PA28 pilot had spoken with the CFI at the gliding club who informed them that they would be filing an Airprox. The pilot asked [the CFI] which aircraft pilot felt there had been an Airprox and they had said it had been the tug taking off from Portmoak at the time the PA28 had been passing. The PA28 pilot had been surprised that this had been considered an Airprox. That having been said, 30hr later the PA28 pilot had been finding it a little hard to be certain about some of the details in their memory as they had [not] written them down. Perhaps a comparison of GPS traces would have been helpful, and they had preserved theirs. The CFI commented that there had been a glider on the hill at the time and that they would ask for their experience too. Perhaps that is the one reported by FLARM. From the PA28 pilot's side they would not say that they had experienced an Airprox, depending on the accuracy of the ADS-B information, and that the SkyDemon traffic indication had not turned red or issued a warning. But maybe that is not really the point. The PA28 pilot reports that they very much regret having passed so close to Portmoak Gliding site, with the accompanying possibility of a much worse outcome. They understand their desire to report the occurrence in some way and support their efforts to help pilots stay away from the airfield. The PA28 pilot noted that they will certainly do so in future. They had discussed what might help pilots avoid the airfield and the CFI commented that if it had been a licensed field with an ATZ it would have been easier for the PA28 pilot to have stayed away. They agreed that in that case they would almost certainly have done so. The light green symbol on the UK SkyDemon maps may be sufficient to plan a safe route during the calm of flight preparation, but in flight it had not been sufficient to grab their attention when deviating from their planned route and trying to manage other threats. A final comment is that the PA28 pilot noted the extensive, and perhaps unusual, use of electronic proximity equipment at Portmoak and thought that to be really good.

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

THE PORTMOAK CFI reports that unfortunately they did not have any AGCS or ATS, nor any RT recording equipment. However, they believed there had been no contact with the overflying PA28 and the ground or any aircraft on their channel (129.980MHz, Common Glider Field Frequency).

THE FIFE A/G OPERATOR reports that there had been no AGCS on the day in question. They had received a PPR request from the PA28 pilot an arrival from [departure aerodrome]. The aircraft had arrived at 1013 and departed at 1455.

THE LEUCHARS CONTROLLER reports that, as the Leuchars Diversion Airfield (LDA) Radar controller, they recall having provided a Traffic Service to the PA28 pilot between 0958 and 1007. The PA28 had been in transit from [...] to [...]. From the controller's point of view this had been a routine IFR transit. The aircraft had been given descent within the limits of the Surveillance Minimum Altitude Chart and had gone en-route continuing their descent to their en-route safety altitude. The controller reports that [after the event], the LDA Switchboard had received a call from a pilot requesting that they impound the R/T tapes in relation to this event.

The controller perceived the severity of the incident as 'Low'.

Factual Background

The weather at Leuchars was recorded as follows:

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METAR EGQL 040950Z 25017KT 9999 FEW017 19/14 Q1021 RMK BLU=
TAF EGQL 031023Z 0312/0321 25016G27KT 9999 FEW025 BECMG 0316/0318 24012KT PROB30 TEMPO
0316/0321 SCT022=
```

Analysis and Investigation

Military ATM

Leuchars ATC had not been providing an Air Traffic Service to either aircraft at the point of the Airprox. However it had [previously] been providing the PA28 pilot with a Traffic Service to facilitate their descent from IFR to VFR. Once established VFR, the PA28 pilot had then terminated the Traffic Service with Leuchars ATC and transferred to Fife conducting blind calls.

At 0955 the PA28 pilot had requested a descent with Leuchars Radar. The Leuchars Radar controller had issued the Portree pressure of 1012hPa and an initial descent to 3000ft. Further descent instructions had then subsequently been issued until the PA28 pilot had established VFR.

At 1004 the PA28 pilot had cancelled IFR and requested transfer to Fife.

2 Gp BM Analysis

The Leuchars Radar controller had provided a routine Traffic Service to facilitate the PA28 pilot's descent to VFR. The point of transfer to Fife had been significantly north of Portmoak such that there had been no requirement for general awareness regarding Portmoak to be passed. Additionally, as Leuchars has no local radar replay function and the NATS radar coverage at low level in that area is poor, it cannot be ascertained if traffic operating from Portmoak had been presented to the Leuchars Radar controller.

UKAB Secretariat

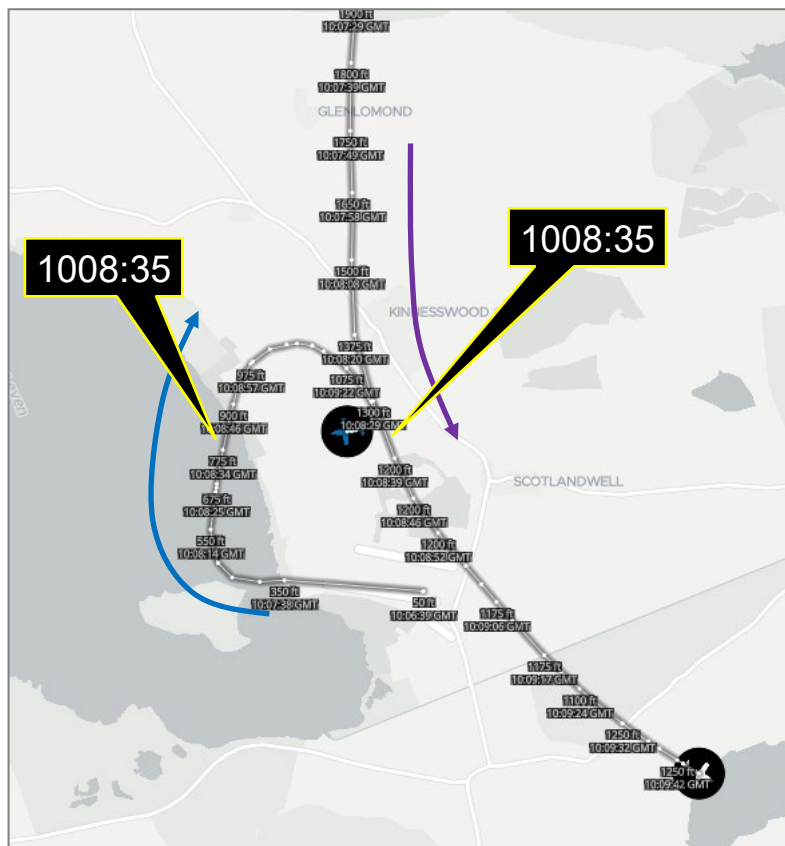


Figure 1: Relevant sections of the two respective flightpaths.

Figure 1 shows the respective flightpaths to the CPA. Heights are referenced to SPS (1013.25hPa) and in calculating the CPA have been corrected to reflect QNH of 1021hPa.



Figure 2: Snapshot of the CAA 1:500,000 VFR chart showing the proximity of the Lomond Hills, Portmoak and Fife.

The Eurofox and PA28 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 An aircraft operated on or in the vicinity of an aerodrome shall conform with or avoid the pattern of traffic formed by other aircraft in operation.³

Comments

AOPA

It is heartening to read the PA28 pilot's comprehensive report with very good planning and safety points covered. Until there is commonality in electronic conspicuity standards and it is mandated, lookout continues to be the primary mid-air collision avoidance technique.

BGA

Portmoak airfield operates 364 days per year during daylight hours (weather permitting), conducting about 6,000 glider winch launches and 2,000 aerotow launches annually (for a total of about 20,000 aircraft movements each year). Glider/Tug aerotow combinations have limited manoeuvrability and are best given a wide berth. Both aerotow and winch launches were in progress at the time of this incident, with the maximum permitted winch launch altitude being 2360ft AMSL (notified in AIP ENR 5.5 and indicated on CAA VFR charts). Overflying this or any other winch site below its notified maximum winch altitude risks encountering high-tensile-strength cable connecting a launching glider to the winch on the ground. It is disappointing that the PA28 EFB's representation of this busy glider launch site as the PA28 flew a descending path towards it, and then clipped the airfield boundary below 1500ft AMSL (see Figure 1) "had not been sufficient to grab [the PA28 pilot's] attention".

In westerly winds the Lomond hills, shown on the chart segment in Part A, generate rising air that's used by gliders to stay airborne. Large numbers of gliders and paragliders may be found soaring along this west-facing ridge up to 4NM north of Portmoak in even the lightest of westerlies, at any time during daylight hours, and at altitudes up to 2000ft AMSL. Under these conditions the 1NM corridor between the airfield and the closest part of the Lomond Hills is heavily used by gliders in

¹ (UK) SERA.3205 Proximity.

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

³ (UK) SERA.3225 Operation on and in the Vicinity of an Aerodrome.

transit between them, typically between 1000ft and 2000ft AMSL, and by gliders flying a right-hand circuit on the north side of the airfield, usually commencing at about 1200ft AMSL.

The PA28 pilot noted that mountain lee wave was apparent on the day in question, and under these conditions Portmoak-based gliders will search for (and often find) this type of rising air well upwind of the Lomond Hills in the vicinity of Loch Leven. If located, "wave" is used to fly gliders locally in Class G airspace at all altitudes up to the base of controlled airspace (which is at various levels between FL65 and FL195 in this area).

The PA28 pilot is to be commended for their open and honest reporting, and for fitting EC equipment that detects both ADS-B and the EC equipment fitted to the vast majority of gliders and glider tow-planes (including this EuroFox). Pilots who fly through areas labelled on CAA charts as having "INTENSE GLIDER ACTIVITY" (as here) should gain safety benefits from configuring their EC and EFB equipment to receive glider EC transmissions in this way.

Summary

An Airprox was reported when a Eurofox and a PA28 flew into proximity 1NM north of Portmoak airfield at 1009Z on Monday 4th September 2023. Both pilots were operating under VFR in VMC, the Eurofox pilot had been listening out on the Portmoak radio channel and the PA28 had been listening out on the Fife Air/Ground frequency.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from both pilots, radar photographs/video recordings, GPS track data and reports from the air traffic controller/Air Ground Operator involved. Relevant contributory factors are listed below with the numbers referring to the Contributory Factors table displayed in Part C.

The Board firstly discussed the actions of the Eurofox pilot noting their status as a towing tug and the reduced manoeuvrability that task affords it. Members positively acknowledged the equipment status of the Eurofox and the pilot's alertness in recognising the potential threat to gliders along the Lomond Hills and the call made on the Portmoak frequency to alert all utilising that channel.

Members went on to discuss the actions of the PA28 pilot, firstly wishing to thank the pilot for a full and frank report and comment. They noted the carriage and use of electronic support aids as well as the punctilious approach to their pre-flight planning that had included back-up options in recognition of the potential for poorer weather than forecast. The Board did suggest that, as the pilot's ultimate destination had been in the immediate vicinity of Portmoak, and that the possibility for re-routing had been considered, adding the contact details for that airfield may have ameliorated the issue. Having committed to a descent in the Lomond Hills area, the PA28 pilot had achieved VMC and had switched from the Traffic Service provision from Leuchars to their destination frequency, making blind calls as they had progressed. On finding themselves amongst traffic at Portmoak, they had recognised the shortfall in their planning and had focussed on the principle of 'aviate, navigate, communicate'. Ultimately, the Board postulated that an option from the pilot's initial plan to extend to the coast and come back to their destination VFR might have proved more comfortable. Members discussed the pilot's post-flight statement that *'The light green symbol on the UK SkyDemon maps may be sufficient to plan a safe route during the calm of flight preparation, but in flight it had not been sufficient to grab their attention when deviating from their planned route and trying to manage other threats'* and agreed that the ability to both layer and de-layer maps on navigation applications offers both positive and negative aspects, highlighting well in this case that de-cluttering and de-prioritisation can lead to missed opportunities to enhance the air picture. However, members were satisfied that there had been sufficient separation between the Eurofox and the PA28, and that there had been no risk of collision and, as such, the Board assigned Risk Category E to this event. Members agreed that the following factors had contributed to this Airprox:

CF1: The PA28 pilot could have considered switching to the Portmoak frequency once committed to their flightpath to the west of the Lomond Hills.

- CF2:** The PA28 pilot flew through a known active glider site.
- CF3:** The PA28 pilot’s pre-flight planning, although thorough, could have included details on Portmoak due to its proximity to their ultimate destination.
- CF4:** The Eurofox pilot had no situational awareness of the PA28.
- CF5:** The PA28 pilot received an Information alert from the Eurofox pilot’s onboard EC equipment.
- CF6:** The onboard EC equipment carried by the Eurofox pilot should have been able to receive emissions from the PA28 equipment but no alert had been reported.
- CF7:** The PA28 pilot did not visually acquire the Eurofox.

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

Contributory Factors:

2023206				
CF	Factor	Description	ECCAIRS Amplification	UKAB Amplification
Flight Elements				
• Tactical Planning and Execution				
1	Human Factors	• Accuracy of Communication	Events involving flight crew using inaccurate communication - wrong or incomplete information provided	Ineffective communication of intentions
2	Human Factors	• Aircraft Navigation	An event involving navigation of the aircraft.	Flew through promulgated and active airspace, e.g. Glider Site
3	Human Factors	• Pre-flight briefing and flight preparation	An event involving incorrect, poor or insufficient pre-flight briefing	
• Situational Awareness of the Conflicting Aircraft and Action				
4	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				
5	Contextual	• Other warning system operation	An event involving a genuine warning from an airborne system other than TCAS.	
6	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				
7	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: E.

Safety Barrier Assessment⁴

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 PA28 pilot could have considered preparing for and calling Portmoak as they entered that operating area.

⁴ The UK Airprox Board scheme for assessing the Availability, Functionality and Effectiveness of safety barriers can be found on the [UKAB Website](#).

Situational Awareness of the Conflicting Aircraft and Action were assessed as **ineffective** because the Eurofox pilot had no situational awareness of the PA28 as it had entered the Portmoak operating area.

Airprox Barrier Assessment: 2023206		Outside Controlled Airspace							
		Provision	Application	Effectiveness					
Barrier				Barrier Weighting					
				0%	5%	10%	15%	20%	
Ground Element	Regulations, Processes, Procedures and Compliance	●	●						
	Manning & Equipment	●	●						
	Situational Awareness of the Conflication & 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	■	■	■	■	□				