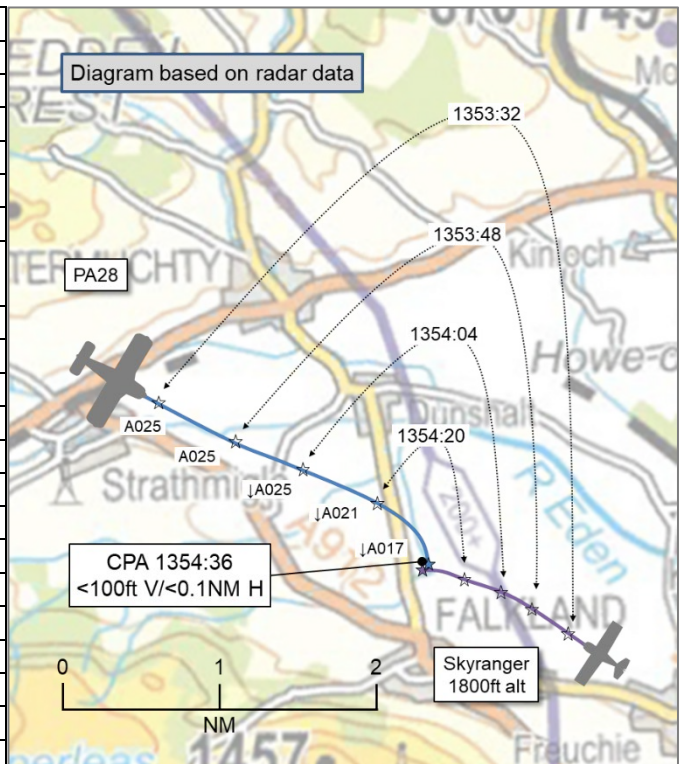


AIRPROX REPORT No 2022268

Date: 28 Nov 2022 Time: 1355Z Position: 5616N 00312W Location: 4NM N Glenrothes

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

| Recorded | Aircraft 1 | Aircraft 2 |
|--------------------------|-------------------|--------------------------|
| Aircraft | PA28 | Skyranger |
| Operator | Civ FW | Civ FW |
| Airspace | Scottish FIR | Scottish FIR |
| Class | G | G |
| Rules | VFR | VFR |
| Service | Basic | Listening Out |
| Provider | Dundee Approach | SafetyCom & Leuchars App |
| Altitude/FL | 1800ft | 1900ft |
| Transponder | A, C, S | A, C, S |
| Reported | | |
| Colours | White, Red | White |
| Lighting | Strobes | Beacon |
| Conditions | VMC | VMC |
| Visibility | >10km | >10km |
| Altitude/FL | >2000ft | 1800ft |
| Altimeter | QNH (1008hPa) | QNH (NK hPa) |
| Heading | 'South-southeast' | 'Northwest' |
| Speed | 100kt | ~75kt |
| ACAS/TAS | Not fitted | PilotAware |
| Alert | N/A | None |
| Separation at CPA | | |
| Reported | 30-40ft V/0m H | Not seen |
| Recorded | <100ft V/<0.1NM H | |



THE PA28 PILOT reports that the aircraft is owned by [name redacted] and they had booked a rental slot from 1330 -1430. Reporting outbound south abeam Errol, the Dundee Approach controller informed them that they were now receiving a Basic Service and advised that they had 'no known traffic' to affect the flight. At 1355, they were just north of Falkland, Fife, slowly descending from 2500ft in a shallow left turn on to an approximate south-south-easterly heading, when [their passenger] suddenly called out "there's a plane" and pointed ahead. Around 200-300m dead ahead, and clearly visible in the upper windscreen area, was a high wing monoplane which was on a reciprocal course, appearing to them as if it would pass very close overhead. Still in a slow descent, they pushed the yoke forward further and the aircraft did pass overhead, clearing them by 30-40ft. It was close enough for them to identify it as a white Skyranger microlight. They continued their shallow left turn and saw the aircraft head off in a north-north-westerly direction. It had made no alteration in course or taken any discernible evasive action, so it may be that the pilot didn't see their aircraft [the PA28]. The conditions were CAVOK with light south-westerly winds, but visibility was hazy with a low sun, which may have affected the other pilot's vision. They called up Dundee Approach and stated that they wished to make an initial Airprox report. They gave brief details and asked whether the other aircraft was in radio contact with Dundee. The controller replied negative and said they'd telephone Leuchars Radar to establish whether the Skyranger pilot was receiving a service from them. That was also a negative, although Leuchars stated that they had both aircraft on radar. The Dundee controller requested that they [the PA28 pilot] telephone Dundee ATC on landing. They then made a few turns left and right before heading back to [destination airfield]. Awaiting their arrival there was a flying instructor and their passenger/student, who were next in line to fly [the aircraft]. [The instructor] informed them that they had witnessed the close encounter on the Flightradar24 app. After completing the paperwork in relation to their flight, they telephoned the ATCO [name redacted], to whom they had made the initial Airprox report, and apprised them of the further details. In regard to the cause of the incident, two aircraft approaching each other head-on initially present a comparatively small visual target. They appear motionless on a collision

course since there is little or no relative lateral movement to attract the pilots' attention while engaged in an all-round visual scan. With a combined approach speed nearing 200kt, there is also little time to react. At the time their passenger alerted them to the other aircraft, they were looking to port in the direction of their shallow turn. But for [the passenger's] call, and their reaction in pushing the yoke forward, the risk of collision would have been greater. In their opinion, if they had changed frequency to Leuchars Radar when outbound at Errol, rather than accepting a Basic Service from Dundee Approach, which is not radar equipped, they may well have received advance warning from Leuchars regarding the unknown traffic, and spotted it much sooner or taken early action to minimise possible conflict.

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

THE SKYRANGER PILOT reports that [they have consulted their EC equipment's] track log to refresh their memory of this flight. The reported incident took place about 10min after they took-off from [departure] airstrip. They hadn't decided where they were going at this stage so hadn't requested a service from Leuchars/Scottish. They were listening out to Leuchars and SafetyCom. Later, they would have switched to [local airfield] radio after deciding to keep going in that direction. They remember [the PA28 pilot] speaking to Leuchars and also recall seeing them on SkyDemon via [their EC equipment] about 5NM or so to the northwest, but which event came first they can't remember. The discussion on the radio matched what they saw on screen. The registration [of the PA28] stuck in their mind as being a [PA28 belonging to a particular organisation]. They believe they heard one other aircraft pilot speaking to Leuchars around that time, but they can't recall anything about them other than them not being particularly close. Aside from these two aircraft, they're not aware of any other aircraft in the vicinity at the reported time of the incident, though as they were passing Balado, another aircraft appeared a couple of thousand feet above them. [The PA28's EC information] disappeared fairly quickly from their screen and they can't recall it appearing again for the rest of the flight. They would have assumed that they had climbed or descended out of the threshold of their traffic alerts, though being aware that [the EC equipment they were using's] signal is not 100% reliable and relies heavily on factors such as relative antenna placement, they would have continued their visual scan for traffic. Given the locations, aircraft type and subsequent directions of travel, they assume [the PA28] was the other aircraft involved. They think the next time they heard them call Leuchars (their standby frequency) they were closer to Balado and they think they were closer to Fife airport, or to the southeast (though they're less sure of this memory). Nothing else stands out about the flight.

THE DUNDEE APPROACH CONTROLLER reports that [the PA28] pilot was placed on a Basic Service and informed that Dundee had no reported traffic to affect on frequency.

At 1358 the pilot of [the PA28] reported an Airprox on the Dundee frequency. The pilot reported that at approximately 1355, they were tracking southeast over Falkland, Fife, at altitude 2000ft on the Dundee QNH 1007hPa, when a small microlight aircraft - believed to be a Skyranger, had passed directly overhead on a reciprocal track. The pilot reported an estimated miss distance of approximately 30ft.

The [PA28] aircraft shortly thereafter returned to [destination airfield]. The pilot was asked to call the tower to discuss the incident. During the phone call they reported that they had become visual with the other aircraft approximately 500m before [the other aircraft] passed over the top of their aircraft. The weather at Dundee was reported as CAVOK, though the pilot reported some haze at altitude. The pilot reported that they had taken avoiding action by pitching the nose down to avoid a collision.

Upon receiving the Airprox report they contacted Leuchars Radar and Scottish Information, neither of which was working the Skyranger involved in the incident. The Leuchars controller reported a 7000 squawk operating in the vicinity of the Airprox at an unverified Mode C altitude of 2000ft.

Factual Background

The weather at Dundee was recorded as follows:

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METAR EGNP 281320Z 25003KT CAVOK 08/06 Q1007
METAR EGNP 281350Z 24006KT CAVOK 08/06 Q1008
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Analysis and Investigation

Dundee ATSU investigation conclusions

Both [the PA28] and the conflicting aircraft were flying in Class G airspace. The conflicting aircraft's pilot does not appear to have been in receipt of any air traffic service. CAP774 states that it is not mandatory for a pilot to be in receipt of an air traffic service in Class G airspace.

Operating ADI/APP, and providing a Basic Service, the Dundee ATCO could not issue Traffic Information on unknown traffic. Under a Basic Service, the avoidance of other traffic is solely the pilot's responsibility. A Basic Service relies on the pilot avoiding other traffic, unaided by controllers.

In-flight visibility resulted in the [PA28] pilot not seeing the conflicting traffic until it was at a distance of approximately 500m.

CAA ATSI

ATSI has reviewed this event and has no comment to add regarding the actions of the Dundee controller.

UKAB Secretariat

An analysis of the NATS radar replay was undertaken and both aircraft were detected and identified using Mode S data. The aircraft elevations on the radar were displayed as a flight level. The Dundee QNH at the time of the Airprox was recorded as being 1008hPa, therefore, assuming 1hPa equates to 27ft, 135ft should be subtracted from the flight levels displayed to obtain the aircraft altitude.

Prior to the Airprox, both aircraft had been maintaining a steady altitude, the PA28 at 2500ft and the Skyranger at 1800ft. The PA28 pilot was maintaining a steady heading whilst the Skyranger pilot's track displayed a small and steady drift to the pilot's left. However, at 1354:08, whilst the Skyranger pilot continued at 1800ft, the PA28 pilot initiated a slow descent. At this time the aircraft tracks were starting to diverge until, at 1354:28, the PA28 pilot, still in the descent, made a turn to their right. At this time the aircraft were separated by 0.4NM laterally and by 200ft vertically with the PA28 above the Skyranger and descending, Figure 1.

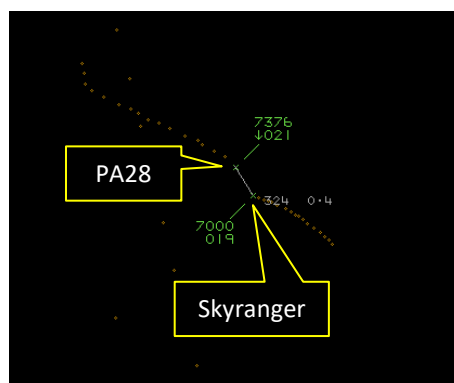


Figure 1 - PA28 pilot initiated right turn.

At 1354:33, the separation had reduced to 0.2NM horizontally and 100ft vertically, Figure 2. On the next radar sweep, 4sec later at 1354:37, the horizontal separation had reduced to less than 0.1NM and, during that 4sec period, the radar recorded that the PA28 had descended through the

altitude of the Skyranger and was now 100ft below it, Figure 3, and so the vertical separation has been recorded as less than 100ft.

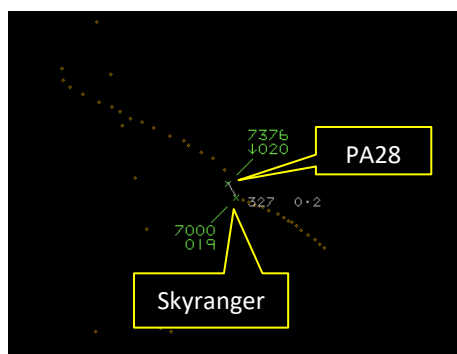


Figure 2 – 1354:33.

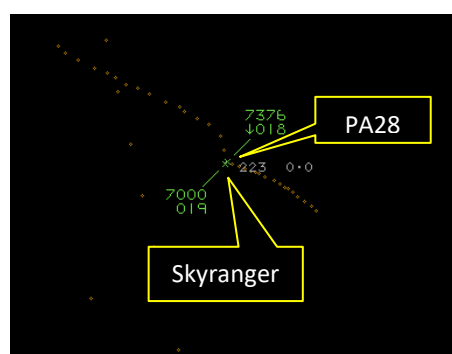


Figure 3 – 1354:37. CPA.

The PA28 and Skyranger 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 Skyranger pilot was required to give way to the PA28.³

Summary

An Airprox was reported when a PA28 and a Skyranger flew into proximity at 4NM north of Glenrothes at 1355Z on Monday 28th November 2022. Both pilots were operating under VFR in VMC, the PA28 pilot in receipt of a Basic Service from Dundee Approach and the Skyranger 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 and a report from the Dundee Approach Controller. The Skyranger pilot had utilised their Electronic Conspicuity (EC) equipment's track log to refresh their memory of the flight. 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 discussed the geographical situation in which the incident had occurred and opined that, for both pilots, seeking an air traffic service – preferably a Traffic Service – from Leuchars would have probably decreased the likelihood of this event occurring. Although the PA28 pilot had been in receipt of a Basic Service from Dundee, there had been no requirement for the Dundee controller to have monitored the flight (**CF1**) and, as the Skyranger pilot had been listening-out on the frequencies for both Leuchars and Safetycom, there had been no common communications link between the 2 pilots involved. The Board agreed that this circumstance alone had significantly contributed to both pilots' lack of situational awareness regarding the presence of the other aircraft (**CF3**). Whereas Dundee Approach had only been able to offer only a non-surveillance Basic Service, Leuchars is able to offer a surveillance-based Traffic Service which, on request, may have enabled the provision of information on conflicting traffic to one or both of the pilots (**CF2**). The Board wished to add that, although 'listening-out' on Safetycom and proximate/relevant air traffic service frequencies is actively encouraged, that alone does not alert other pilots to the presence of one's own aircraft and, if able, a pilot's transmission of position and intent helps to build the air picture for all.

Members also noted that, although the Skyranger pilot had equipped their aircraft with an EC device which would have been expected to have detected the PA28, they had not received an indication of the presence of the PA28 from that equipment (**CF4**). The Board also noted that the PA28 pilot had not had

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..

any additional EC equipment on their aircraft. It is for all pilots to decide on their own requirements for additional equipment according to their needs, and the Board wished to highlight to pilots that funding in support of purchase of EC equipment remains available for the current Financial Year through the CAA's EC Rebate Scheme.⁴ Additionally, the Board wished to re-state the need to consider use of ALL available methods of conspicuity – and that includes visual options; if an airframe is equipped with lighting its use should be a consideration for VFR operations in UK airspace.

When assessing the risk involved in this Airprox, members considered the reports from both pilots and the radar replay and NATS report. They noted that the separation between the two aircraft had been minimal, with no sighting from one pilot, and an extremely late sighting from the other pilot (**CF5, CF6**) allowing little time to react. The Board concluded, therefore, that although the PA28 had taken last-minute avoiding action, this had not removed the risk of collision entirely (**CF7**) and that safety had not been assured. Consequently, the Board assigned a Risk Category B to this Airprox.

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

Contributory Factors:

| 2022268 | | | | |
|--|---------------|--|---|--|
| 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 |
| 6 | 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 | | | | |
| 7 | 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.

⁴ <https://www.caa.co.uk/general-aviation/aircraft-ownership-and-maintenance/electronic-conspicuity-devices/>

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:

Ground Elements:

Situational Awareness of the Confliction and Action were assessed as **not used** because, as Dundee is a non-surveillance equipped unit, the Dundee controller had not had any ability to monitor the flight of the PA28. Additionally, under the Basic Service they had been providing, there had not been any requirement for the controller to monitor the flight of the PA28.

Flight Elements:

Tactical Planning and Execution was assessed as **partially effective** because, although the PA28 pilot had been in receipt of a Basic Service from Dundee Approach, they may have been better served by requesting a service from a surveillance-equipped unit such as Leuchars.

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, although the Skyranger pilot had been carrying EC equipment capable of detecting the PA28, it did not alert when the 2 aircraft were in close proximity.

See and Avoid were assessed as **partially effective** because the Skyranger pilot did not become visual with the PA28 and, although PA28 pilot had visually acquired the Skyranger in time to enable them to take effective avoiding action, this had been at a later than optimum point.

| Airprox Barrier Assessment: 2022268 | | Outside Controlled Airspace | | | | | | |
|-------------------------------------|--|-----------------------------|---------------|----------------------------|----------|-----|-----|--|
| Barrier | Provision | Application | Effectiveness | | | | | |
| | | | 0% | 5% | 10% | 15% | 20% | |
| Ground Element | Regulations, Processes, Procedures and Compliance | ✓ | ✓ | [Green bar to 5%] | | | | |
| | Manning & Equipment | ✓ | ✓ | [Green bar to 2.5%] | | | | |
| | Situational Awareness of the Confliction & Action | ✗ | ○ | [Red bar to 15%] | | | | |
| | Electronic Warning System Operation and Compliance | ● | ● | [Grey bar to 2.5%] | | | | |
| Flight Element | Regulations, Processes, Procedures and Compliance | ✓ | ✓ | [Green bar to 10%] | | | | |
| | Tactical Planning and Execution | ✓ | ⚠ | [Yellow bar to 10%] | | | | |
| | Situational Awareness of the Conflicting Aircraft & Action | ✗ | ✓ | [Red bar to 20%] | | | | |
| | Electronic Warning System Operation and Compliance | ⚠ | ✗ | [Red bar to 15%] | | | | |
| | See & Avoid | ⚠ | ⚠ | [Yellow bar to 20%] | | | | |
| Key: | | | | | | | | |
| | Full | Partial | None | Not Present/Not Assessable | Not Used | | | |
| Provision | ✓ | ⚠ | ✗ | ● | ○ | | | |
| Application | ✓ | ⚠ | ✗ | ● | ○ | | | |
| Effectiveness | ■ | ■ | ■ | ■ | □ | | | |

⁵ The UK Airprox Board scheme for assessing the Availability, Functionality and Effectiveness of safety barriers can be found on the [UKAB Website](#).