



Southend Radar had identified the A319 using Mode-S and had confirmed that no unknown returns were present on his radar display; replay of the radar recording of the incident supports this. The A319 was vectored initially on a heading of 350° for right base to RW06, between 2 other transiting aircraft that were identified and receiving a service. Southend Radar then turned the A319 left by 15° onto a heading of 335°. The A319 was provided with a Deconfliction Service; the normal deconfliction minima that ATC seek to achieve from unknown traffic are 3000ft vertically or 5nm laterally. However, because the paramotor was neither known, nor showing on the radar display, ATC intervention was not possible and the A319 pilot was not given any warning of the conflicting traffic - it was not possible for the controller to pass either traffic information or avoiding action on an aircraft that was not being presented on the radar.

Stoke microlight site is near to Southend and, within 45 minutes of the Airprox, Southend ATC had spoken to the owner, who confirmed that they had no para-gliders or para-motors based there, and nothing had yet flown from them that day.

The radar recording was analysed and, whilst several intermittent primary contacts could be seen over a long time-scale, none of them could be correlated with the A319 pilot's report. The Unit asked their technical staff and the radar manufacturer to investigate the performance of their radar with a view to improving its performance against small targets.

**The Radar Manufacturer** reports that the paramotor was probably detected for a short period of time at the raw-radar plot data level, but that it was probably too small to be detected consistently by the radar. In order to reduce false radar returns produced by clutter, the equipment has a tracker filter, which removes raw-radar plots having a speed of less than 40kt. It is likely therefore that the raw-radar plot data did not generate a track on the radar display due to the low detection rate caused by the paramotor's very small radar cross-section and its low speed.

#### **Southend Unit Recommendations:**

*Recommendation 1: Southend ATE should re-engage with the radar manufacturer to see if any further optimisation of the PSR elements of the radar can be done to enhance chances of detection of very small/slow targets, particularly in areas of known Airprox concern.*

*Recommendation 2: Southend Airport continues to seek to obtain CAS as soon as possible in order to provide better protection for aircraft flying instrument flight procedures into and out of Southend.*

*Recommendation 3: Southend Airport to ask regular commercial operators to re-iterate to their pilots operating at Southend that not all smaller/slower targets will be detected by modern radar systems.*

[UKAB Note 1: These recommendations are not necessarily the view of the UK Airprox Board].

**CAA ATSI** reports that they had access to Southend RTF, area radar recordings, together with the written reports from the Southend controller, ATSU and A319 pilot. The A319 was operating an IFR flight inbound to Southend Airport and was in receipt of a Deconfliction Service from Southend Approach.

The paramotor was untraced, very likely operating VFR, and not in receipt of an air traffic service.

At 0835:03, the A319 was 13.1nm south-southwest of Southend Airport. The A319 pilot contacted Southend Radar and reported descending to 3000ft on a northerly heading. The controller passed traffic information regarding a PA28, co-ordinated at 2000ft in the A319's 1 o'clock at 2.5nm. A Deconfliction Service was agreed, and the A319 pilot reported visual with the traffic. The A319 was then turned left onto a heading of 350°.

At 0836:00 the A319 had passed abeam the south-bound PA28 and was instructed to descend to an altitude of 2000ft, with a left turn onto a heading of 335° for base leg.

At 0836:50 the Radar controller passed traffic information regarding another PA28:

Radar: “[A319)c/s] traffic left er ten o'clock correction half past nine five and a half miles passing well down your left hand side is a piper arrow two thousand feet”

A319: [0837:00]“That’s understood we’ve just had some kind of erm a para-glider or something like that passing very very close to our left hand side [A319)c/s]”

Radar: “Roger nothing ob- seen on radar are you happy to continue on that track”

A319: “Er affirm he’s passed us now but it was very close [A319)c/s]”.

At 0837:33 the A319 was given a closing heading for the localiser and continued with the approach without further incident.

The controller reported that there were no unknown returns shown in close proximity to the A319 at the time of the Airprox, and this was confirmed by a replay of the ATSU radar recording.

CAA ATSI completed an analysis of the area radar recordings, which did show a probable intermittent contact that appeared 20 seconds after the Airprox. This contact appeared 0.25nm left of the A319’s radar trail history and was shown for two sweeps of the radar followed by a final trace at 0837:58 before the contact faded from radar, as shown in figure 1.

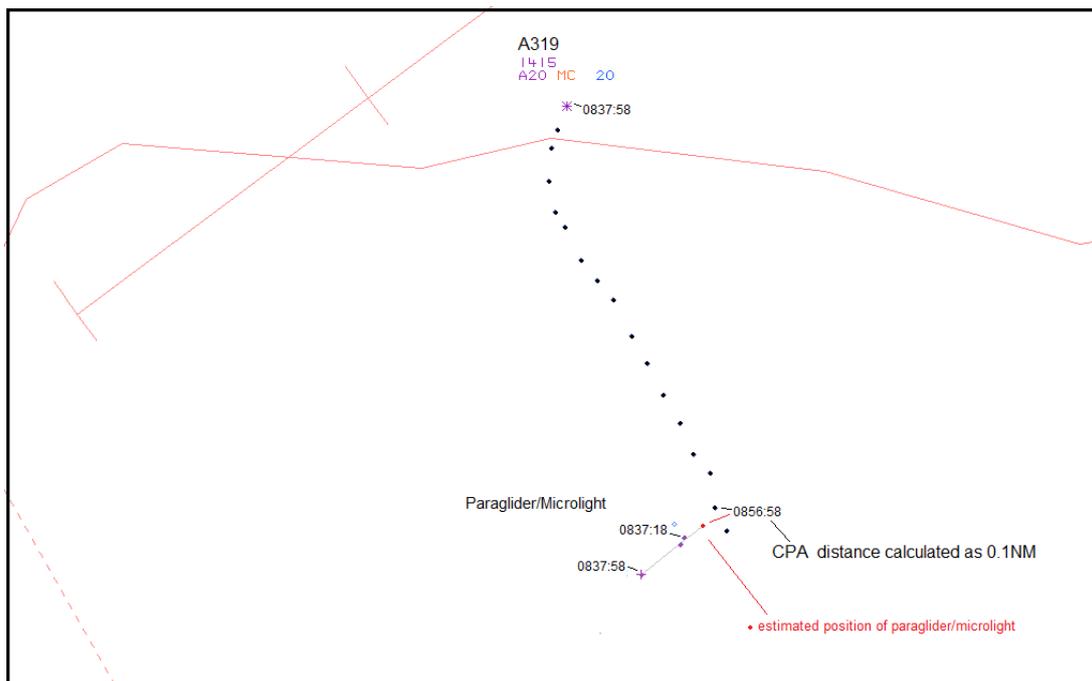


Figure 1 – Swanwick MRT at 0837:58 (UKAB Note: CPA label should read 0836:58)

By measuring the distance (0.3nm) between the returns at 0837:18 and 0837:58 (40seconds), the ground speed of the unknown contact was calculated as 27knots. At this speed the contact would have travelled 0.15nm since the time of the Airprox. This is shown on Figure 1 above and, at CPA, the unknown contact was estimated to be around 0.1nm (185m) to the left of the A319 [UKAB Note 2: this measurement is subject to uncertainty in radar return display inaccuracies and should not be considered as definitive].

After the Airprox, the ATSU initiated tracing action but the paramotor remained untraced.

The ATSU, in consultation with the radar manufacturer, reported that the unknown paramotor was too small in terms of radar cross-section, and was travelling too slowly to be displayed by Southend Radar. The radar processing system 'tracker' filter removes raw-radar plots having a speed below 40 knots in order to reduce the false alarm clutter. The calculated ground speed of the unknown contact was 27 knots. The Southend radar detection system is approved and compliant with the requirements of CAP670 ATS Safety Requirements.

Following increased operations from Southend since April 2012, London Southend Airport has undertaken a formal consultation (conducted between 20 September 2013 to 19 December 2013) to seek to re-establish Controlled Airspace around Southend Airport.

**ATSI Analysis:** The A319 was in receipt of a Deconfliction Service; a surveillance-based service under which controllers will provide surveillance-derived traffic information. However, the avoidance of other traffic is ultimately the pilot's responsibility and the provision of the service is constrained by the unpredictable nature of the environment.

Because of the paramotor's small radar cross-section and slow speed it was not displayed by the Southend Radar system. As a result there was no specific surveillance-derived information regarding the paramotor, and the Southend Radar controller was not able to provide tactical deconfliction advice or warning to the A319 pilot.

Within Class G airspace, regardless of the service being provided, pilots are ultimately responsible for collision avoidance

## Summary

The Airprox occurred at 0836:58, 8.4nm south-west of Southend Airport, within Class G airspace, between an A319 and an untraced paramotor. The unknown paramotor was too small and too slow to be displayed by the Southend Radar system and, in the absence of surveillance-derived information, the Southend radar controller was therefore unable to provide any deconfliction advice.

## **PART B: SUMMARY OF THE BOARD'S DISCUSSIONS**

Information available included a report from the crew of the A319, transcripts of the relevant RT frequencies, radar photographs/video recordings, a report from the air traffic controller involved and a report from the ATC operating authority.

The Board noted that the Airprox occurred in Class G airspace, for which see-and-avoid was the primary method of collision avoidance. Both aircraft were equally entitled to be in that location, and therefore the pilots shared equal responsibility for collision avoidance. Notwithstanding, the Board observed that the paramotor pilot had probably been unwise to position himself at 2000ft so close to the approach track for Southend's active RW06, and at a location which would have been frequented by aircraft routing to Southend for IFR approaches. The gliding member concurred, and opined that the positioning of the paramotor possibly indicated a low-level of aviation awareness by its pilot. Unfortunately, because the paramotor pilot could not be traced, the Board were unable to explore further this aspect. As an aside, the Board also noted that the fact that the pilot had not come forward himself (after what must have been a frightening event), was an additional indicator as to his likely inexperience in aviation matters.

The airline members stated that, in this case, TCAS would not have been able to provide protection because the paramotor would not have been equipped with an SSR transponder or other electronic conspicuity aid. They also commented on the difficulty of seeing such small aircraft, especially from the cockpit of a much faster moving large airliner. The Board were informed that paramotor pilots do not require a licence to fly, although they are still required to comply with the Rules of the Air. The British Hang Gliding and Paragliding Association (BHPA) oversees pilot and instructor training standards for Free Flying, which includes the operation of paramotors, but there is no requirement for a paramotor pilot to join the BHPA. Although it was not possible to determine for this particular

incident, it was noted that paramotor pilots could potentially operate entirely independently and with very little training in Air Law and airmanship matters; members expressed concern over the risks associated with this potential paucity of training and regulation given their ability to range extensively within UK airspace. With this particular incident in mind, and noting that Southend was applying for controlled airspace to be established around the airport, airline members expressed concern over whether all paramotor pilots would necessarily understand the nuances of the airspace; VFR traffic operating within and around Southend needed to understand where other traffic was likely to be encountered, and what their associated routeing might be.

The Board did not have a report from the paramotor pilot but members were of the unanimous opinion that he was highly likely to have seen and heard the A319 pass close by given that the two aircraft were facing each other at the same altitude. The Board could not establish whether the paramotor pilot took avoiding action but it was clear that the A319 pilot had not seen the paramotor early enough to do so himself. Both pilots were equally responsible for collision avoidance<sup>1</sup>, and the A319 pilot was required to give way<sup>2</sup>. The Board therefore decided that the cause was an effective non-sighting by the A319 pilot. In assessing the risk, Board members noted that the A319 crew had not had time to take any avoiding action, and that the radar analysis supported the pilot's estimate of horizontal separation. The Board were therefore unanimous in agreeing that separation had been reduced to the minimum, and that the Degree of Risk was Category A. Noting the concerns raised about ensuring the competency and training of paramotor pilots, the Board also decided to recommend that the CAA reviews the regulation and licensing of paramotor glider pilots.

#### **PART C: ASSESSMENT OF CAUSE AND RISK**

<u>Cause:</u>	Effectively, a non-sighting by the A319 pilot.
<u>Degree of Risk:</u>	A.
<u>ERC Score</u> <sup>3</sup> :	2500.
<u>Recommendation:</u>	The CAA reviews the regulation and licensing of paramotor glider pilots.

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<sup>1</sup> Rules of the Air 2007 (as amended), Rule 8 (Avoiding aerial collisions).

<sup>2</sup> *ibid.*, Rule 9 (Converging). A paramotor is classed as a glider in the ANO.

<sup>3</sup> Although the Event Risk Classification (ERC) trial had been formally terminated for future development at the time of the Board, for data continuity and consistency purposes, Director UKAB and the UKAB Secretariat provided a shadow assessment of ERC.