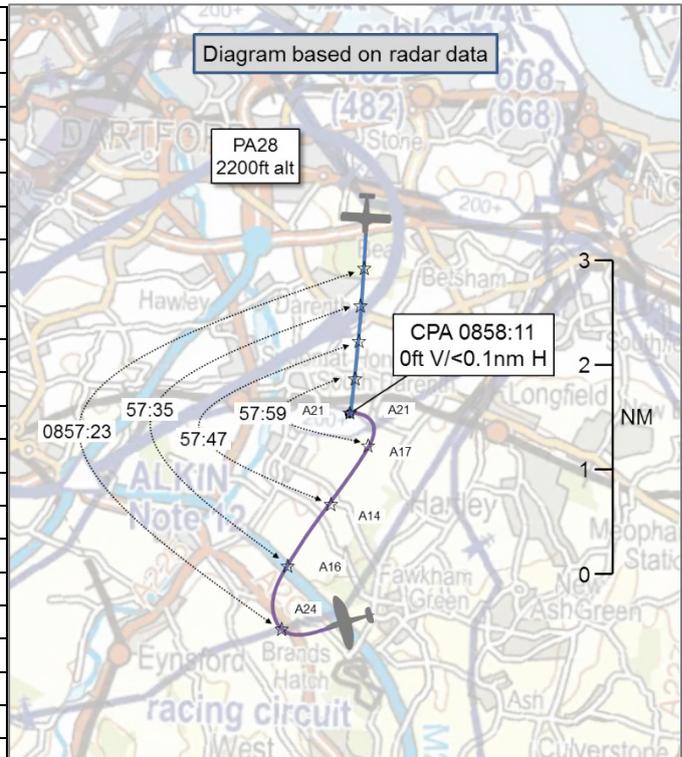


**AIRPROX REPORT No 2018276**

Date: 29 Sep 2018 Time: 0858Z Position: 5124N 00016E Location: 9.5nm NE Biggin Hill

**PART A: SUMMARY OF INFORMATION REPORTED TO UKAB**

| Recorded    | Aircraft 1     | Aircraft 2      |
|-------------|----------------|-----------------|
| Aircraft    | PA28           | Spitfire        |
| Operator    | Civ FW         | Civ Comm        |
| Airspace    | London FIR     | London FIR      |
| Class       | G              | G               |
| Rules       | VFR            | VFR             |
| Service     | Basic          | NK <sup>1</sup> |
| Provider    | Farnborough    | Biggin Approach |
| Altitude/FL | 2200ft         | 2200ft          |
| Transponder | A, C, S        | A, C, S         |
| Reported    |                |                 |
| Colours     | White, blue    | Green, brown    |
| Lighting    | 'none'         | NK              |
| Conditions  | VMC            | VMC             |
| Visibility  | '20000km'      | >10km           |
| Altitude/FL | 2000ft         | 1800ft          |
| Altimeter   | QNH (NK hPa)   | NK              |
| Heading     | 180°           | NK              |
| Speed       | 110kt          | 220kt           |
| ACAS/TAS    | Not fitted     | PowerFLARM      |
| Alert       | N/A            | None            |
| Separation  |                |                 |
| Reported    | 0ft V/NK H     | 400ft V/NK H    |
| Recorded    | 0ft V/<0.1nm H |                 |



**THE PA28 PILOT** reports being in straight-and-level cruise when a Spitfire came up towards them from below in a very steep climbing-left-turn. The PA28 pilot took avoiding action by making a sharp left-turn and descending rapidly. The pilot stated that the Spitfire appeared to ‘fill the entire windscreen’ as it came past. The pilot also noted that such aircraft are camouflaged and very difficult to see, that there were 4 qualified pilots on board the PA28, and that it was only by chance that one of the back seat passengers managed to see the Spitfire at the last second. He felt that the Spitfire’s dynamic manoeuvring should be carried out in ‘less congested airspace’.

He assessed the risk of collision as ‘High’.

**THE SPITFIRE PILOT** reports that during initial positioning for a ‘Victory Roll’ an aircraft was sighted at a range of approximately 3nm and 700ft above, north and slightly left of the 12 o'clock. A track adjustment was made to the right to ensure separation and the manoeuvre completed below the other aircraft (a PA 28). The climb continued and an arc was flown above and behind the other aircraft to reverse the direction of travel for return to home base. At no point was he closer than approximately 400ft and was at the CPA with a diverging track. At no point did he witness any change in the other aircraft’s flightpath.

He did not provide an assessment of the risk of collision.

**THE FARNBOROUGH LARS CONTROLLER** reports that the Airprox was not reported on frequency and that he had no recollection of the incident or aircraft involved.

<sup>1</sup> The FIS was not reported, however, the Spitfire SSR transponder was selected to the Biggin Hill Airport conspicuity code and the radio was tuned to Biggin Approach frequency.

## Factual Background

The weather at Biggin Hill was recorded as follows:

METAR EGKB 290850Z VRB02KT CAVOK 13/08 Q1030=

## Analysis and Investigation

### UKAB Secretariat

The PA28 and Spitfire pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard<sup>2</sup>.

## Comments

### Spitfire Operating Company

An interview was conducted with the pilot regarding the event. A review of risk assessment was also conducted, which found that, due to a number of similar events, further mitigation was warranted. Barriers to avoid a collision course conflict in Class G were assessed to be as follows:

1. A radar service when available (as aircraft is manoeuvring a Traffic Service is not available).
2. See and avoid.
3. Transponder (against ACAS equipped aircraft)
4. Fit FLARM to aircraft
5. Fit strobe lights to aircraft
6. Paint invasion stripes on upper wing surfaces
7. Paint invasion stripes full width on fuselage
8. Brief pilots on mitigation - selected altitude, operational area etc
9. Discuss with Farnborough ATC possibility of dedicated squawk so they are aware of aircraft for other traffic

Risk was assessed using the following assumptions: approximately 18,800 non CS25 aircraft on the UK register and 1,200 CS25 aircraft. Each makes an estimated 200 flights per year on average. About 4,000,000 flights per year total; 3-4 mid-air collisions per year; one mid-air collision about every 1,000,000 flights. PowerFLARM is carried so this reduces the risk of collision course conflict, but airspeed is higher (180 knots) and the aircraft is camouflaged. Visibility is no worse than a Cessna. Estimated risk of collision course conflict is 1 in 1,000,000 although PowerFLARM is likely to make this risk lower than the risk assessment shows. Operations take place away from congested areas. The likelihood of a MAC ending up in ground fatalities is low from historical data.

## Summary

An Airprox was reported when a PA28 and a Spitfire flew into proximity near Biggin Hill at 0858hrs on Saturday 29<sup>th</sup> September 2018. Both pilots were operating under VFR in VMC, the PA28 pilot in receipt of a Basic Service from Farnborough.

## **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 air traffic controller involved.

The Board first discussed the Spitfire pilot's actions in the context of the barriers to avoid a 'collision course conflict' as provided by the Spitfire operating company. Members noted that the Spitfire pilot had reported seeing the PA28 at range, and had had it in sight continuously until CPA. After carrying

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<sup>2</sup> SERA.3205 Proximity.

out a 'Victory Roll' below the PA28, he had then flown a climbing arc to the left and had closed to within 0.1nm on radar and not less than approximately 400ft according to the Spitfire pilot's report. Members were unanimous in their concern at this course of action. Although the Spitfire pilot was no doubt content with his flight path and could judge that his flight vector would not intersect the PA28's flight path, he had no information as to whether the PA28 pilot had seen him, nor of the PA28 pilot's intentions (the PA28 pilot could easily have inadvertently turned towards the Spitfire when in close proximity). Whilst the Spitfire operating authority's risk mitigations were all well and good, they counted for little if a pilot knowingly chose to fly towards another aircraft. Some members wondered whether the Spitfire pilot should routinely have requested a Traffic Service to assist in avoiding other aircraft, but members pointed out that in this case he had seen the PA28 at a range of 3nm and that Traffic Information would not have affected the outcome.

Members next discussed the PA28 pilot's actions and noted that he had not seen the Spitfire until its proximity was pointed out to him by a pilot-qualified rear-seat passenger. The pilot reported that the Spitfire climbed from below and 'filled the entire windscreen as it came past'; he took evasive action by descending and turning to the left.

The Board spent some time discussing the apparent inconsistency between the PA28 and Spitfire pilots' reports. The Spitfire pilot had stated that he had passed behind the PA28 whilst the PA28 pilot was adamant that the Spitfire had passed close in front. Unfortunately, the radar replay was not of sufficient resolution to resolve the issue definitively, and members noted that displayed track positions during highly-dynamic manoeuvring could be misleading. Some members wondered whether the Spitfire pilot had not seen the subject PA28 but was reporting on another PA28 nearby. The radar did not show any other tracks in the vicinity at that time and date and so although this seemed unlikely, no firm conclusion could be made. Another member wondered whether the Spitfire pilot had mistaken the PA28 for the Spitfire company's GA8 chase-plane and had deliberately closed towards for a pre-briefed photo opportunity; other members thought this unlikely given the high-wing configuration of the G8 and the low-wing of the PA28. The Board were sufficiently perplexed that the UKAB Secretariat contacted the PA28 and Spitfire pilots to re-confirm the correct date, time and place of occurrence. Both pilots confirmed their reports were correct: the PA28 pilot stating that the Spitfire had passed directly in front, 'filling the entire windscreen' and that he could see 'every rivet'; the Spitfire pilot stating that he had had the PA28 continuously in sight and that he had passed behind it.

In light of this information, the report was re-submitted to the Airprox Board for further consideration. Members agreed that despite the discrepancies between reported circumstances they were able to state definitively that, having seen it at range, the Spitfire pilot had flown into conflict with the PA28. Turning to the risk, all members felt that the Spitfire pilot's proximity to the PA28 was such that safety had been reduced. Some members opined that if the Spitfire pilot had flown in front of the PA28, as its pilot reported, then it appeared that collision had only been avoided by providence (Category A). Others noted that despite his reported continuous visual sighting of the PA28, even if his flight path had been behind it, the Spitfire pilot's choice of separation at CPA was ill-advised to the extent that safety had been much reduced below the norm because he could not have known the PA28 pilot's intentions as he closed. After further discussion, the Board eventually agreed that because it was not possible to definitively decide whether the Spitfire pilot had flown in front or behind, the risk of collision could only be assessed as at least Category B, safety had been much reduced below the norm.

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

Cause: The Spitfire pilot flew into conflict with the PA28.

Degree of Risk: B.

### Safety Barrier Assessment<sup>3</sup>

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

#### ANSP:

**Situational Awareness and Action** were assessed as **not used** because neither pilot was in receipt of a service that required situational awareness or action from the controller.

#### Flight Crew:

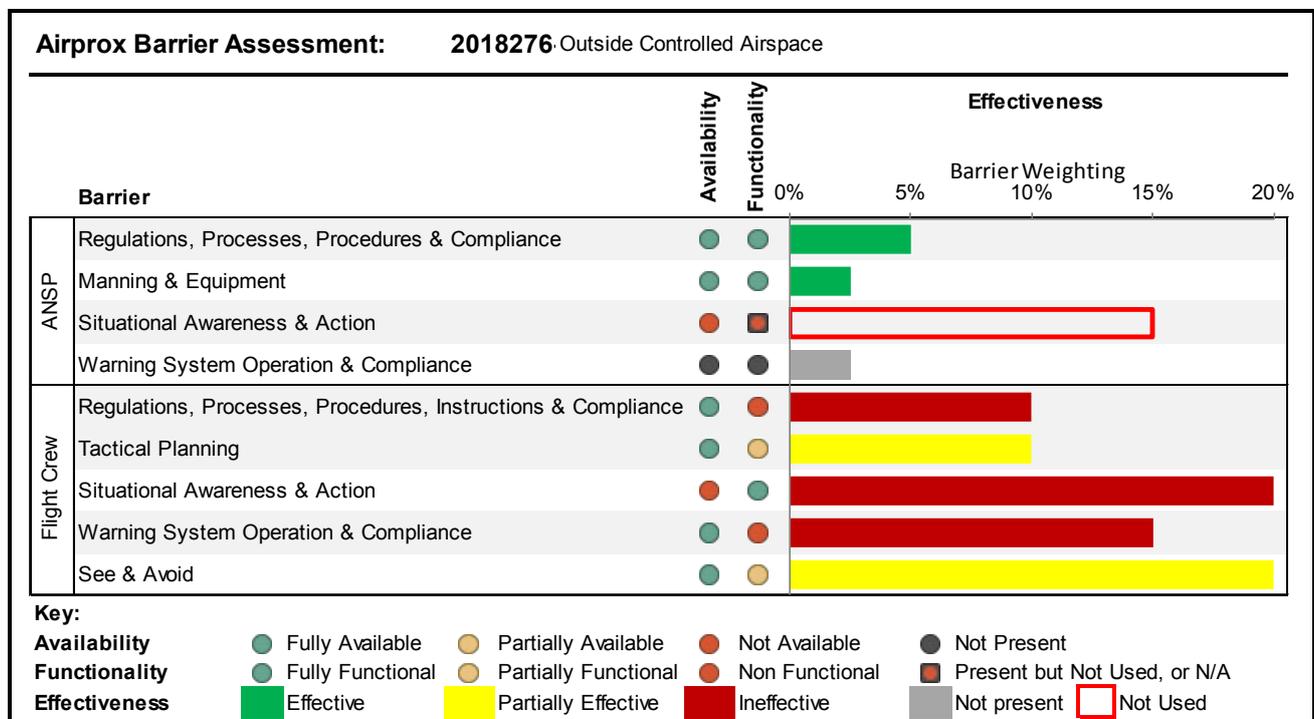
**Regulations, Processes, Procedures, Instructions and Compliance** were assessed as **ineffective** because separation at CPA was such that it was felt that the Spitfire pilot had not ensured that he did not create a collision hazard.

**Tactical Planning** was assessed as **partially effective** because the Spitfire pilot did not sufficiently modify his plan to ensure adequate separation once he had sighted the PA28 at an estimated range of 3nm.

**Situational Awareness and Action** were assessed as **ineffective** because neither pilot was aware of the other aircraft until visually sighted.

**Warning System Operation and Compliance** were assessed as **ineffective** because either the Spitfire's TAS did not alert or he did not take appropriate action if it did.

**See and Avoid** were assessed as **partially effective** because although the Spitfire pilot established visual contact with the PA28 at a reported range of 3nm, he continued to fly into proximity with it.



<sup>3</sup> The UK Airprox Board scheme for assessing the Availability, Functionality and Effectiveness of safety barriers can be found on the [UKAB Website](#).