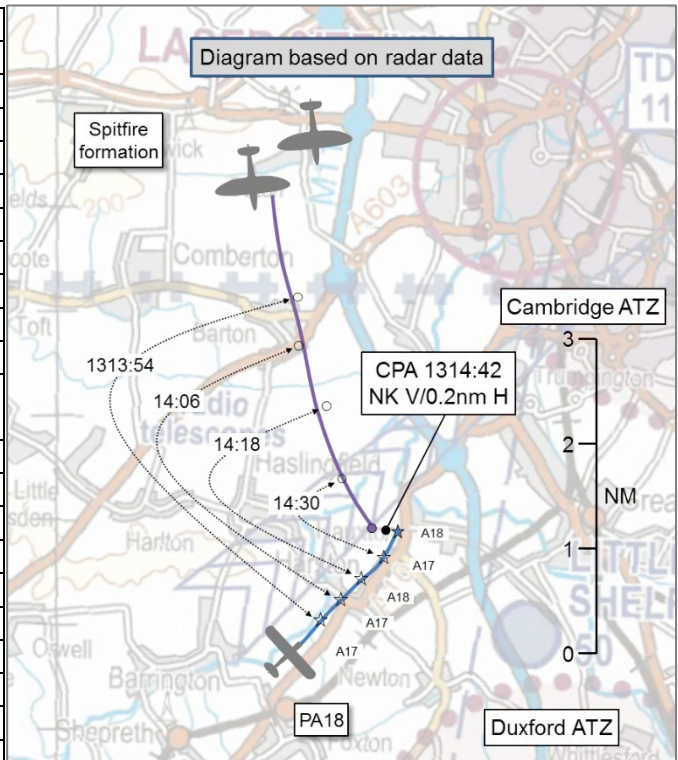


AIRPROX REPORT No 2018174

Date: 12 Jul 2018 Time: 1315Z Position: 5209N 00005E Location: 5nm SW Cambridge Airport

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	PA18	2 x Spitfire
Operator	Civ FW	Civ FW
Airspace	London FIR	London FIR
Class	G	G
Rules	VFR	VFR
Service	Basic	AFIS
Provider	Cambridge	Duxford
Altitude/FL	1700ft	NK
Transponder	A, C, S	PSR only
Reported		
Colours	White, blue	Silver (No 2 camouflage)
Lighting	NK	NK
Conditions	VMC	VMC
Visibility	30nm	NK
Altitude/FL	NK	2000ft
Altimeter	NK	QFE (NK hPa)
Heading	NK	~180°
Speed	NK	250kt
ACAS/TAS	Not fitted	Not fitted
Separation		
Reported	NK	500ft V/1½-¾nm H
Recorded	NK V/0.2nm H	



THE CAMBRIDGE CONTROLLER reports that the PA18 pilot called Cambridge Radar for a Basic service at 1308Z. He was given a squawk and reported being 'at 1900ft'. As the aircraft approached Cambridge, it descended in accordance with the cloud ceiling which was BKN016. When the PA18 was about 4-5nm south of Cambridge airport, tracking northeast, a fast-moving primary-only contact was observed approaching quickly from the northwest. The approaching aircraft crossed through the Cambridge final approach track at approximately 4nm. Traffic Information was passed to the PA18 pilot, who acknowledged, and the Traffic Information was quickly updated, using clock code, because the approaching traffic was deemed a definite confliction. The confliction judgement was based on the approaching traffic pointing at Duxford aerodrome (so could well have been inbound to Duxford) and, given the cloud ceiling and obstacle clearance requirements, it was likely that it would be between 1000ft and 1600ft, in direct confliction with the PA28. The contacts merged without the PA18 pilot being visual with the traffic. The controller contacted Duxford FISO and established that the primary-only contacts were a pair of Spitfires inbound to Duxford. The controller stated that in his opinion this was very poor airmanship, made even more dangerous because he believed the unknown aircraft to be transponder equipped. Given the tight nature of the airspace around that area, the use of a transponder, when carried and serviceable is crucial.

THE PA18 PILOT reports that he had no recollection of seeing any other aircraft in the Cambridge area on that day.

THE SPITFIRE PILOT reports that he had no knowledge that there had been an incident until reported to him by the Airprox Board. He was leading a formation of 2 Spitfires for a formation recovery into Duxford when 'ATC' reported a PA18 transiting through their overhead from southwest to northeast. The Spitfire pilot saw the PA18 and the formation passed well astern and above its flight path.

He assessed the risk of collision as 'None'.

Factual Background

The weather at Cambridge was recorded as follows:

METAR EGSC 121320Z 01007KT 330V050 9999 BKN016 18/12 Q1022=

Analysis and Investigation

CAA ATSI

The PA18 pilot called Cambridge Radar at 1307:55 (Figure 1), reported his position and altitude, and requested a transit through the Cambridge airfield overhead.

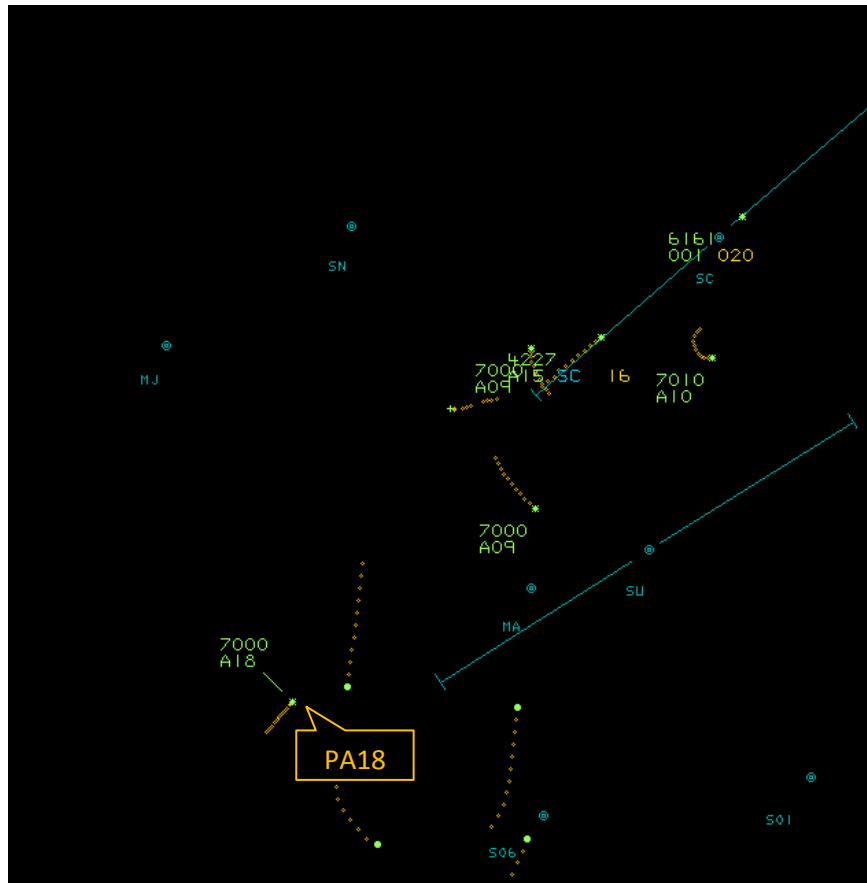


Figure 1 – 1307:55

The Cambridge radar controller acknowledged the information, allocated a transponder code (6160), passed the Cambridge QNH, and agreed a Basic Service. The controller then started to provide Traffic Information to another aircraft on contacts operating 5-6nm southwest of Cambridge.

At 1308:36, the lead pilot of a Spitfire formation pair contacted the Duxford AFISO, advising that they were inbound to them for a short display and estimated arrival in 6 mins. At 1312:10, following an enquiry by other traffic in the circuit at Duxford, the Duxford AFISO requested a position and ETA update from the Spitfire formation lead pilot. The pilot reported passing abeam Cambridge. The AFISO acknowledged this, and requested a call with 2 mins to go before their join. Figure 2, at 1313:04, shows a fast-moving primary-only contact, believed to be the Spitfire pair. It was not possible to positively identify the Spitfire on the radar replay.

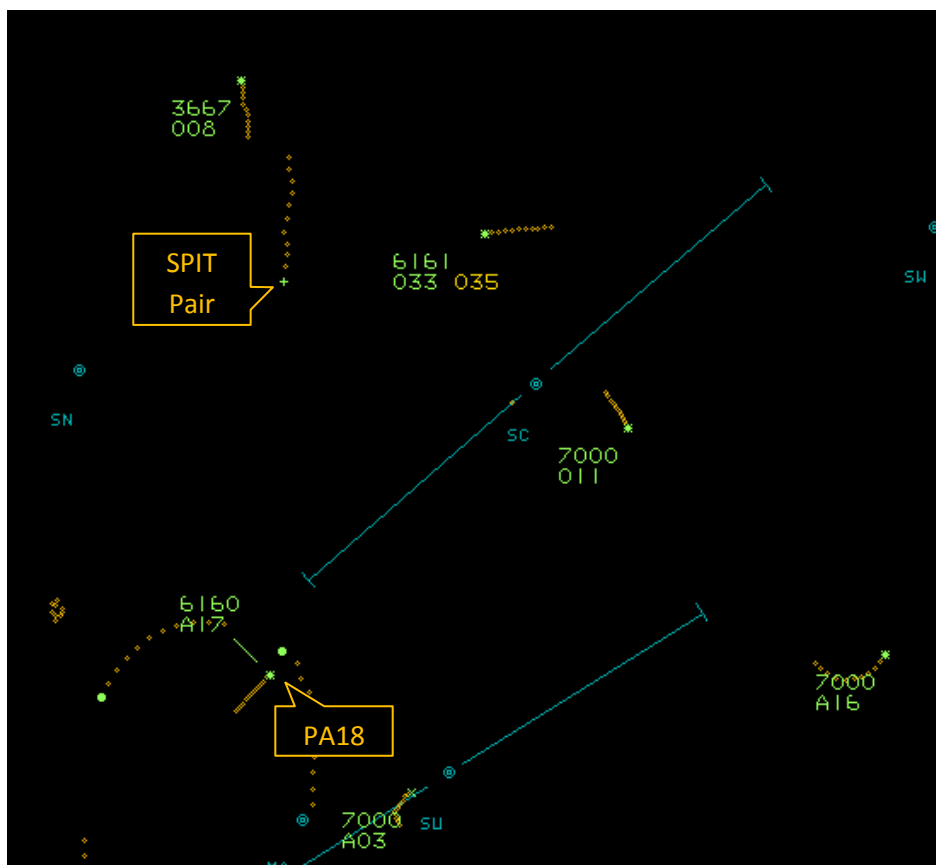


Figure 2 – 1313:04

At 1313:10, the Spitfire pilot advised the Duxford AFISO that they were '2 minutes out'.

At 1314:10, the Cambridge controller passed Traffic Information to the PA18 pilot on the primary-only contact, believed to be the Spitfire formation, advising that the traffic was north of the PA18 by 2 miles, that it was fast moving, but that there was no level information (Figure 3).

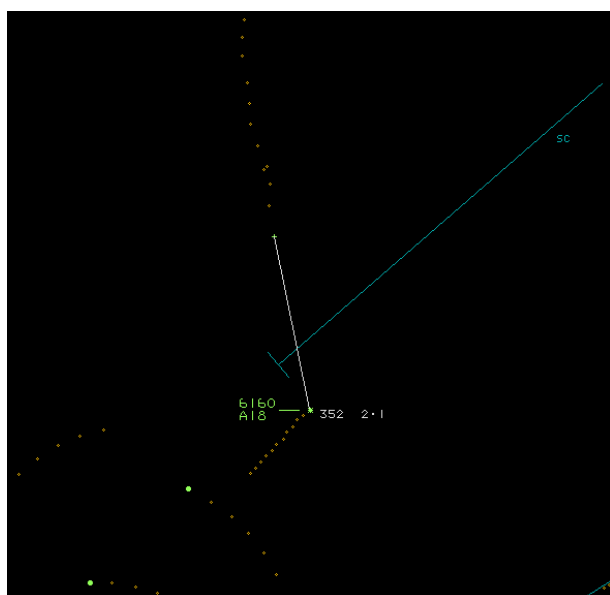


Figure 3 – 1314:10

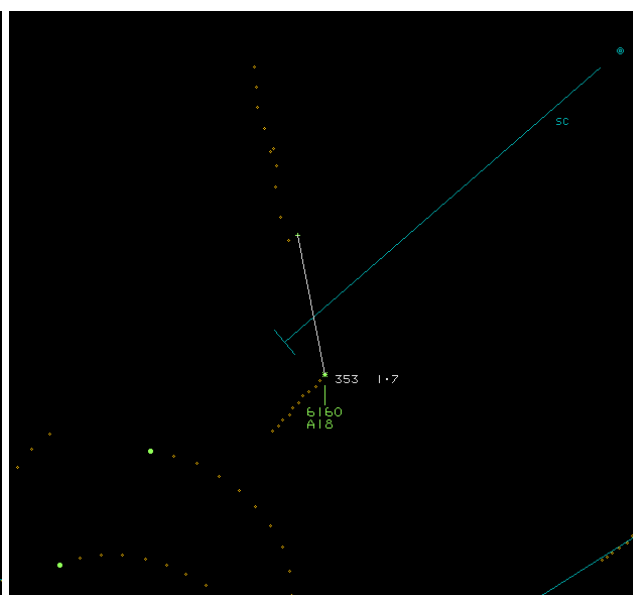


Figure 4 – 1314:20

At 1314:20 (Figure 4), the Cambridge controller updated the PA18 pilot on the position of the Spitfire formation, referencing its position using the clock-code method. The PA18 pilot advised that he was looking.

At 1314:40 (Figure 5), the Cambridge controller advised that the traffic was passing/merging with the PA18.

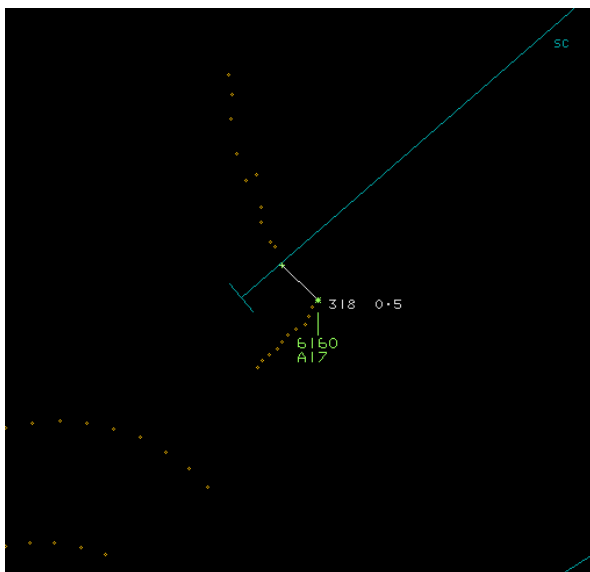


Figure 5 – 1314:40

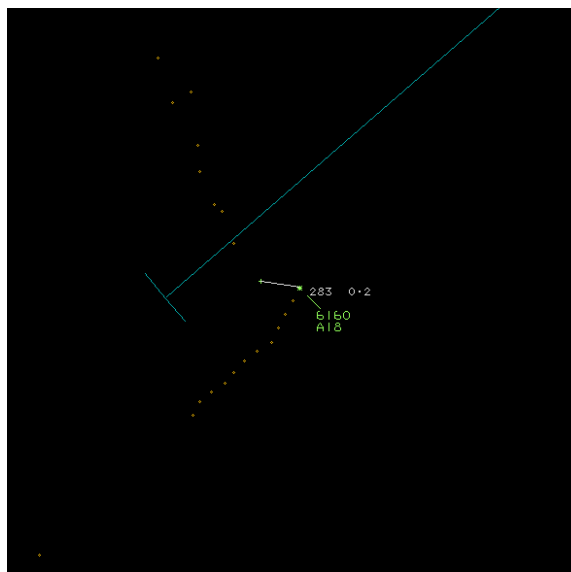


Figure 6 – 1314:42

CPA took place at 1314:42 (Figure 6). Only the lateral separation of 0.2nm could be determined from the radar replay. The Cambridge controller, who had earlier been busy vectoring two training aircraft for instrument approaches around primary contacts operating in the Cambridge final approach area, passed Traffic Information to the PA18 pilot on three occasions. However, the PA18 pilot ultimately did not acquire visual contact with the Spitfires. The Airprox took place in Class G airspace where both pilots were ultimately responsible for collision avoidance.

UKAB Secretariat

The Spitfire pilots and PA18 pilot shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard¹. If the incident geometry is considered as converging then the Spitfire pilot was required to give way to the PA18². When an aircraft carries a serviceable SSR transponder, the pilot shall operate the transponder at all times during flight, regardless of whether the aircraft is within or outside airspace where SSR is used for ATS purposes³. And when not receiving air traffic services, select [Mode A] code 7000 in order to improve the detection of suitably equipped aircraft unless otherwise prescribed by the competent authority⁴. When the aircraft carries serviceable Mode C equipment, the pilot shall continuously operate this mode unless otherwise dictated by ATC⁵. Aircraft equipped with Mode S having an aircraft identification feature shall transmit the aircraft identification as specified in Item 7 of the ICAO flight plan or, when no flight plan has been filed, the aircraft registration⁶.

Aerodromes having one or more Instrument Approach Procedures (IAP) outside controller airspace are denoted on the CAA VFR chart by an IAP symbol, otherwise known as 'feathers'. Advice on the chart states that:

'The symbols are aligned along the extended centreline of the MAIN instrument runways and are not representative of the coverage area of the IAP associated with that runway. Pilots intending to fly within 10nm of any part of the IAP symbol are strongly advised to contact the aerodrome ATSU.'

¹ SERA.3205 Proximity.

² SERA.3210 Right-of-way (c)(2) Converging.

³ SERA.13001 Operation of an SSR transponder.

⁴ SERA.13005 SSR transponder Mode A code setting.

⁵ SERA.13010 Pressure-altitude-derived information.

⁶ SERA.13015 SSR transponder Mode S aircraft identification setting.

Summary

An Airprox was reported when a PA18 and a formation of 2 Spitfires flew into proximity at 1315hrs on Thursday 12th July 2018. All pilots were operating under VFR in VMC, the Spitfire pilot in receipt of an AFIS from Duxford and the PA18 pilot in receipt of a Basic Service from Cambridge.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from both pilots, radar photographs/video recordings, a report from the air traffic controller involved and a report from the appropriate ATC authority.

The Board first discussed the Spitfire formation's transit to Duxford and noted that the lead Spitfire transponder had stopped giving an output when about 40nm north of Cambridge. Members surmised that neither Spitfire pilot had attempted to obtain an Air Traffic Service after that point and that they were therefore unaware that their SSR response was not functioning. Notwithstanding the legal requirement to squawk with all modes, members reiterated the value of SSR transponder output in alerting other aircrafts' CWS. As the Spitfire formation approached Duxford, the Cambridge controller had seen the approaching primary-only contacts and had been sufficiently concerned at the converging tracks that he had felt it necessary to pass Traffic Information to the PA18 pilot. Members noted that the Spitfire formation leader had not contacted Cambridge despite the advice to do so contained on the CAA VFR chart; given the Spitfire formation's proximity to Cambridge, the Board agreed that this was a contributory factor.

Turning to the cause and risk, members noted that the PA18 pilot had reported that he did not see the Spitfire formation, which passed behind with 0.2nm separation and apparently 500ft above according to the Spitfire pilot. Noting that the Spitfires would likely have presented a small cross-section when observed nearly head-on to the PA18 pilot, some members also commented that the PA18 pilot was flying at the reported cloud-base (BKN at 1600ft) and wondered whether, being above him, the Spitfires might also have been obscured to him by cloud at times. For his part, the lead Spitfire pilot commented that he had seen the PA18 (although it was unclear from his report at what range this had been), and had assessed that there was sufficient lateral and vertical separation. Taking all this into account, members debated the cause and, while some felt that the Spitfire formation had flown unnecessarily close to the PA18, the majority agreed that, taking the Spitfire pilot's report at face-value, 500ft vertical separation represented circumstances where normal procedures, safety standards and parameters had pertained in Class G airspace. Accordingly, the Board agreed that the incident was best described as the Cambridge controller being concerned by the proximity of the Spitfire formation to the PA18.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Cambridge controller was concerned by the proximity of the Spitfire formation to the PA18.

Contributory Factors: The Spitfire pilots did not communicate with the Cambridge controller prior to flying through their approach feathers.

Degree of Risk: E.

Safety Barrier Assessment⁷

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

⁷ The UK Airprox Board scheme for assessing the Availability, Functionality and Effectiveness of safety barriers can be found on the [UKAB Website](#).

Flight Crew:

Regulations, Processes, Procedures, Instructions and Compliance were assessed as **partially effective** because the SSR transponder was not selected on.

Tactical Planning was assessed as **partially effective** because the Spitfire formation did not contact Cambridge before passing within 10nm of the instrument approach.

