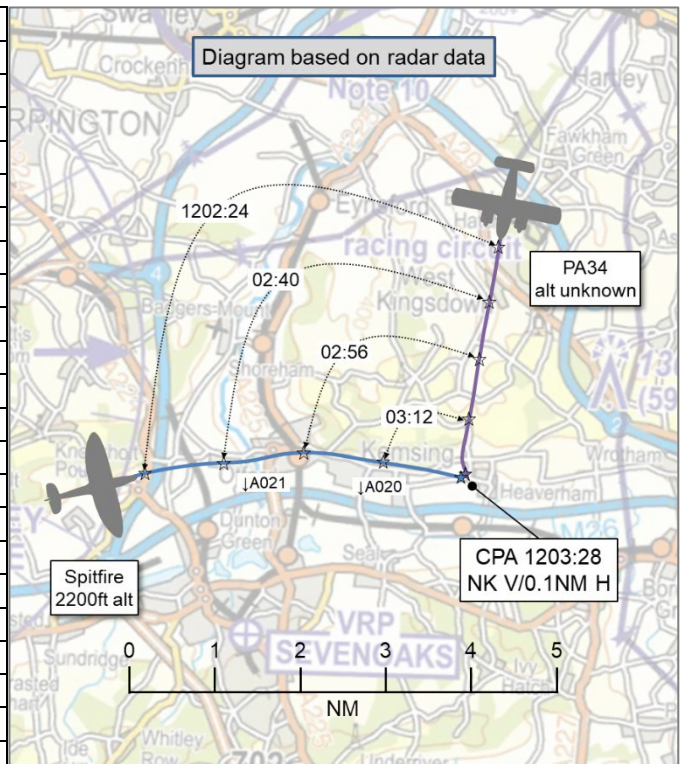


AIRPROX REPORT No 2021104

Date: 09 Jul 2021 Time: 1203Z Position: 5118N 00015E Location: 3NM NE of Sevenoaks

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	Spitfire	PA34
Operator	Civ FW	Civ FW
Airspace	London FIR	London FIR
Class	G	G
Rules	VFR	VFR
Service	Listening Out	Listening Out
Provider	Biggin Approach	London Info
Altitude/FL	2000ft	NK
Transponder	A, C, S	A, S ¹
Reported		
Colours	Camouflage	White, blue
Lighting	Nil	Strobe, nav lights
Conditions	VMC	VMC
Visibility	>10km	>10km
Altitude/FL	2100ft	2000ft
Altimeter	QNH (1021hPa)	QNH (NK hPa)
Heading	110°	185°
Speed	200kt	140kt
ACAS/TAS	Not fitted	Not fitted
Separation		
Reported	0ft V/50m H	50ft V/1.0NM H
Recorded	NK V/0.1NM H	



THE SPITFIRE PILOT reports that they departed the Biggin Hill ATZ to the east via Sevenoaks, to transit to a display site near Dover. They maintained the Biggin Mode C squawk and remained on the Biggin Approach frequency. They were instructed to call upon re-joining and were informed of two other aircraft operating to the east. They acknowledged the traffic and said that they would maintain a lookout. A few minutes later, whilst approximately on an easterly heading, they scanned to the left and saw a light twin [engine aircraft] in the 11 o'clock position, co-altitude at close range, moving left-to-right (heading roughly in a southerly direction). The twin was already rolling to the left, in what appeared to be an avoiding motion. Once they established that the twin was not pitching up, they pitched up and to the left in an avoiding action. They did not report the Airprox on the frequency upon which they were essentially maintaining a listening watch. They did not see the light twin again.

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

A QUALIFIED PILOT ACCOMPANYING THE PA34 PILOT reports that, as a witness, they can confirm what happened. They were travelling from the north of London with the autopilot on, straight and level, heading down to the coast. It was a cloudy day, but they were below the clouds in VMC with 10km visibility, flying at about 145kts at 2000ft. They were not in receipt of an ATS, but listening-out on London Information and Squawking 7000. Strobe and nav lights were on. They did not have TCAS. They were all keeping a lookout but it wasn't until the last minute that they saw the Spitfire (2 o'clock, same level) heading straight for them, very fast. They put a steep left bank in and luckily [the Spitfire pilot] put a turn to the right ([the Spitfire pilot's] left) in just after they did, so the collision was avoided. They checked out of the back left window whilst still in the turn and they could see the Spitfire still turning to the left also, the separation was about 400ft by this point. They immediately checked FlightRadar and Planefinder to find out the registration and its path, but they couldn't see it on there. They got back on their path and carried on down to [their destination].

¹ The NATS radars did not detect any Mode C output from the PA34.

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

THE BIGGIN HILL SATCO reports that the last RTF conversation from Biggin Hill Approach to [the Spitfire pilot] was following the pilot's report of passing one of their VRP's at Sevenoaks outbound. The pilot was told "*to keep a good lookout for two aircraft in the local area and call when you re-join*". Technically, the [Spitfire pilot] was still in receipt of a Basic Service from Biggin Hill Approach. However, when outbound aircraft reach the various reporting points they operate on a listening watch basis until they return. Biggin Hill Approach was not able to pass any Traffic Information on the PA34 as it was not working Biggin Hill and therefore unknown.

Factual Background

The weather at Biggin Hill was recorded as follows:

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METAR EGKB 091150Z 25004KT 210V290 9999 -SHRA SCT040 19/14 Q1021=
METAR EGKB 091220Z VRB03KT 9999 FEW045 19/14 Q1021=
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Analysis and Investigation

CAA ATSI

The RTF was requested from Biggin Hill. The Biggin Hill SATCO confirmed that, due to the Spitfire pilot having left the frequency a few minutes prior to the reported Airprox, there was nothing on the RTF relating to this incident. Biggin Hill ATC operates in a non-surveillance environment and was not aware of the presence of the PA34.

The RTF was also requested from London Information, who confirmed that the PA34 was not in receipt of a service from them at any time prior to, or after, the reported Airprox.

The information below has been assembled with limited information, using the radar replay, the information contained within the pilot reports, and the synopsis from the RAC.

The Spitfire pilot departed Biggin Hill to the east, via Sevenoaks and was in transit to a display site near Dover.

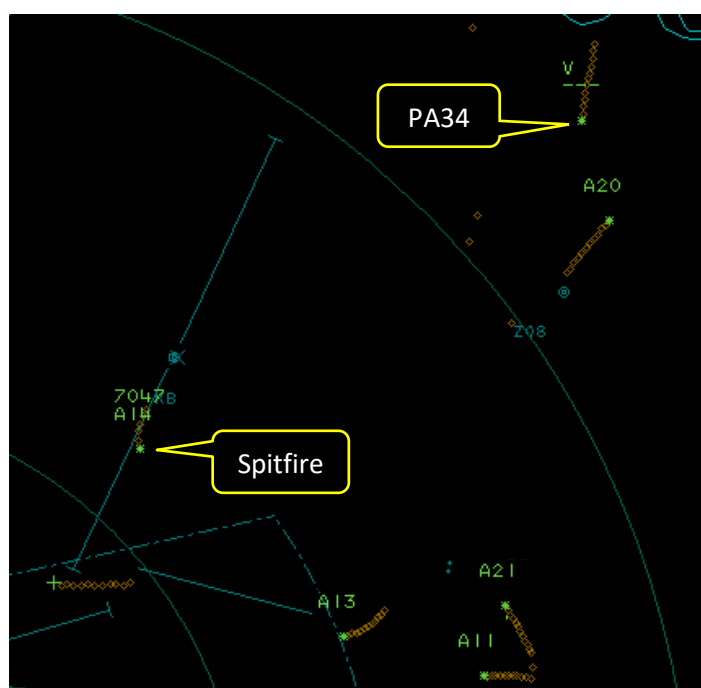


Figure 1 – 1200:35 Spitfire airborne and in the climb

The Biggin Hill controller instructed the Spitfire pilot to call ready for re-join on the return leg and, just prior to leaving the frequency, the controller passed Traffic Information on two known aircraft operating to the east. The pilot acknowledged the traffic and said they would maintain a lookout.

The screenshots below illustrate how the event unfolded:

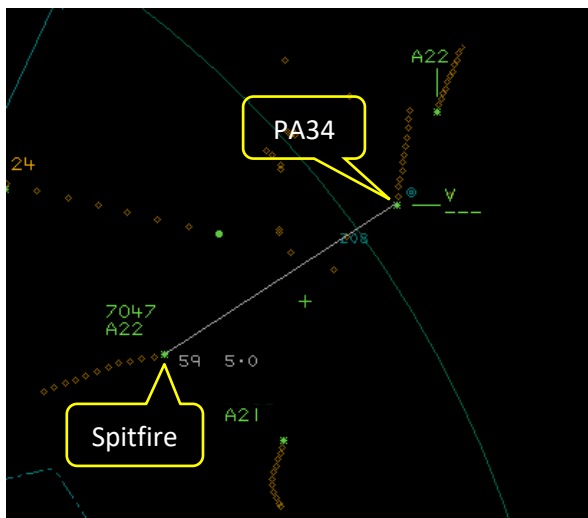


Figure 2 – 1202:20

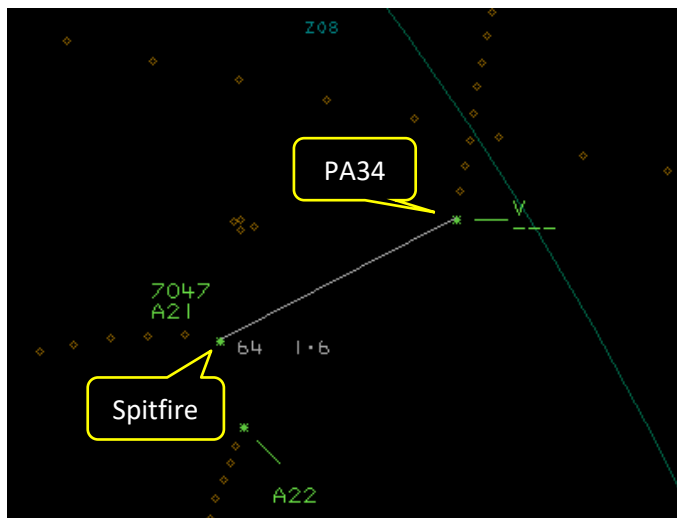


Figure 3 – 1203:04

A few minutes after the ATC service from Biggin Hill was terminated, and whilst on an easterly heading, the Spitfire pilot scanned to the left and saw a light twin in their 11 o'clock, co-altitude at close range, moving left-to-right, heading roughly in a southerly direction.

The PA34 pilot reported seeing the Spitfire at the last minute, in their 2 o'clock, at the same level, heading straight for them and very fast. The PA34 pilot reported banking steeply to the left, and that they then saw the Spitfire turn to the right (the Spitfire pilot's left).

The Spitfire pilot reported that the twin appeared to be rolling to the left in an avoiding motion and that, once they had established that the twin was not pitching up, the Spitfire pilot pitched up and to the left, to avoid.

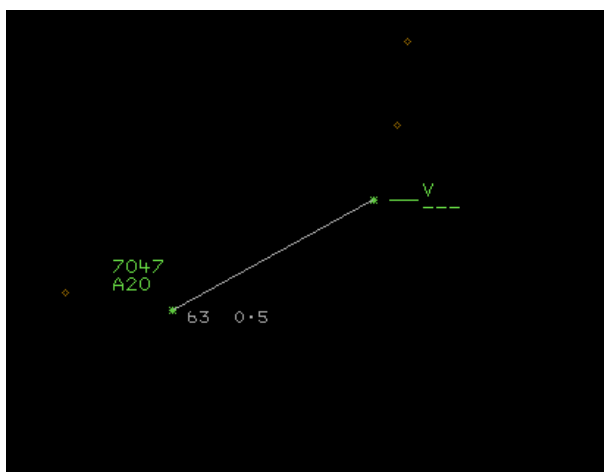


Figure 4 – 1203:20

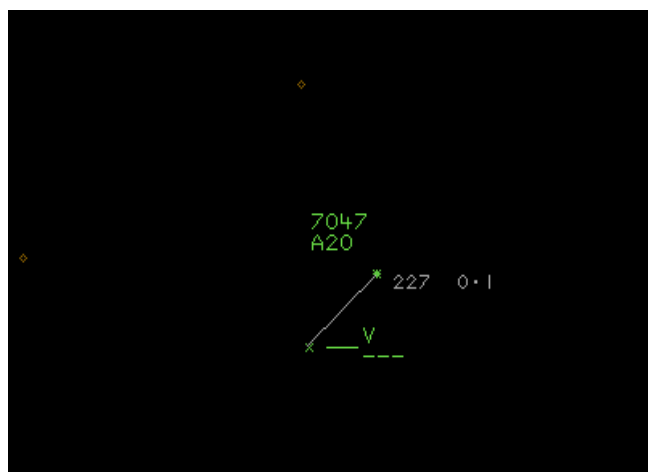


Figure 5 – 1203:28 – CPA

The aircraft were separated laterally by 0.1NM at CPA. The Spitfire pilot was indicating altitude 2000ft and the PA34 pilot reported being level at altitude 2000ft.

UKAB Secretariat

The Spitfire and PA34 pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard.² If the incident geometry is considered as converging then the PA34 pilot was required to give way to the Spitfire.³

Summary

An Airprox was reported when a Spitfire and a PA34 flew into proximity 3NM NE of Sevenoaks at 1203Z on Friday 9th July 2021. Both pilots were operating under VFR in VMC, the Spitfire pilot listening out on the Biggin Approach frequency and the PA34 pilot listening out on the London Information frequency.

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 operating authority. 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 considered the actions of the Spitfire pilot. Members wondered why they had chosen to remain on the Biggin Approach frequency in the knowledge that the controller would not have been able to provide them with any Traffic Information as the controller did not have access to surveillance equipment. The Board heard from a GA pilot member that, in this area, LARS is available from either Farnborough (LARS East) or Southend, and the Board considered that the Spitfire pilot may have been better served had they sought a surveillance-based ATS from either of these agencies (**CF2**). The Board agreed that, in the event, the Spitfire pilot had not had any situational awareness of the presence of the PA34 (**CF3**) and so had been relying on the See and Avoid barrier for the avoidance of airborne conflict. However, the Board noted that the Spitfire pilot had not sighted the PA34 until it had already been in an avoidance turn and so considered that this late sighting on the part of the Spitfire pilot had been contributory to the Airprox (**CF4**).

Turning to the actions of the PA34 pilot, the Board noted that the report had been filed by a qualified pilot passenger because the pilot had not been prepared to file their own report; the Board was grateful to the reporter, as their participation in the process had greatly enhanced the Board's understanding of events leading up to the Airprox. Members noted that the pilot had been listening-out on the London FIS frequency and, as with the Spitfire pilot, considered that a surveillance-based ATS from either Farnborough or Southend would likely have provided a better opportunity for the pilot to have been made aware of the presence of the Spitfire (**CF2**). Once again, the pilot had not been in a position to receive any off-board warning (through Traffic Information) of the Spitfire's presence, neither had they been carrying any additional on-board equipment that might have detected the Spitfire and alerted the pilot to its presence; the Board agreed that this lack of situational awareness of the Spitfire's relative position had been contributory to the Airprox (**CF3**). This had also led to the PA34 pilot relying on their lookout to detect any threats to their aircraft, and members noted that all the aircraft's occupants had been contributing to this task. Nevertheless, the Board considered that the nature of the avoiding action taken by the pilot on sighting the Spitfire indicated that the PA34 pilot had sighted the aircraft at a late stage and that this had been contributory to the Airprox (**CF4**).

The Board then briefly considered the actions of the Biggin Approach controller and quickly agreed that there was little that they could have done to assist the Spitfire pilot in their detection of the PA34. The Board noted that the Biggin Approach controller did not have access to any surveillance equipment and, while technically still delivering a Basic Service to the Spitfire pilot (the ATS had not been formally terminated), they had nevertheless not been required to monitor the aircraft (**CF1**). The Board also noted that the apparent local practice of pilots remaining on the Biggin Approach frequency once

² (UK) SERA.3205 Proximity.

³ (UK) SERA.3210 Right-of-way (c)(2) Converging.

beyond the Biggin VRPs, but maintaining a listening watch on the frequency, was of little benefit to pilots in the detection of traffic that may be of interest to them.

Finally, the Board considered the risk involved in this Airprox. Members noted that the pilots had assessed the risk of collision to be 'high' and 'medium' respectively, and that both pilots had had to take late and significant avoiding action. Although it had not been possible to establish the vertical separation from the recorded radar data, both pilots had assessed there to have been very little vertical separation between the 2 aircraft. This, coupled with a recorded horizontal separation of 0.1NM, led the Board to conclude that safety had been much reduced and that a risk of collision had definitely existed (**CF5**). Accordingly, the Board assigned a Risk Category B to this Airprox.

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

Contributory Factors:

2021104				
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 or only generic, Situational Awareness
• See and Avoid				
4	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
• Outcome Events				
5	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

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:

Ground Elements:

Situational Awareness of the Confliction and Action were assessed as **not used** because the Biggin Approach controller was not required to monitor the Spitfire under the terms of a Basic Service (notwithstanding that the Spitfire pilot considered themselves as 'listening out' on the Approach frequency).

Flight Elements:

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

Tactical Planning and Execution was assessed as **partially effective** because neither pilot had elected to seek a surveillance-based Air Traffic Service, which may have assisted them in their early detection of the other aircraft.

Situational Awareness of the Conflicting Aircraft and Action were assessed as **ineffective** because neither pilot had any awareness of the presence of the other aircraft until they sighted it.

See and Avoid were assessed as **partially effective** because neither pilot saw the other aircraft in time to significantly increase the separation between the 2 aircraft.

Airprox Barrier Assessment: 2021104		Outside Controlled Airspace					
Barrier	Provision	Application	Effectiveness				
			Barrier Weighting				
			0%	5%	10%	15%	20%
Ground Element	Regulations, Processes, Procedures and Compliance	✓	✓	[Green bar: 0% to 5%]			
	Manning & Equipment	✓	✓	[Green bar: 0% to 2.5%]			
	Situational Awareness of the Conflicting Aircraft & Action	✗	○	[Red bar: 0% to 15%]			
	Electronic Warning System Operation and Compliance	●	●	[Grey bar: 0% to 2.5%]			
Flight Element	Regulations, Processes, Procedures and Compliance	✓	✓	[Green bar: 0% to 10%]			
	Tactical Planning and Execution	✓	!	[Yellow bar: 0% to 10%]			
	Situational Awareness of the Conflicting Aircraft & Action	✗	✓	[Red bar: 0% to 20%]			
	Electronic Warning System Operation and Compliance	●	●	[Grey bar: 0% to 15%]			
	See & Avoid	!	!	[Yellow bar: 0% to 20%]			
Key:							
	Full	Partial	None	Not Present/Not Assessable	Not Used		
Provision	✓	!	✗	●			
Application	✓	!	✗	●	○		
Effectiveness	[Green]	[Yellow]	[Red]	[Grey]	[Red Box]		