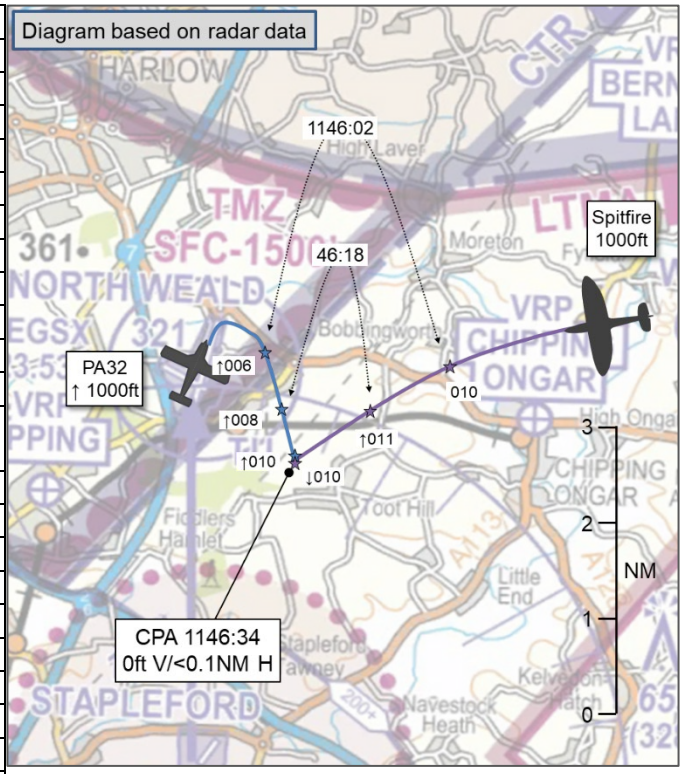
AIRPROX REPORT No 2021113

Date: 16 Jul 2021 Time: 1146Z Position: 5142N 00010W Location: North Weald

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	PA32	Spitfire
Operator	Civ FW	Civ FW
Airspace	London FIR	London FIR
Class	G	G
Rules	VFR	VFR
Service	AGCS	AGCS
Provider	North Weald	North Weald
Altitude/FL	1000ft	1000ft
Transponder	A, C, S	A, C, S
Reported		
Colours	White, Red, Blue	Grey, Green
Lighting	Strobes, Nav, Beacon	NR
Conditions	VMC	VMC
Visibility	>10km	>10km
Altitude/FL	950ft	1000ft
Altimeter	QNH (1027hPa)	QNH
Heading	160°	SW
Speed	130kt	NK
ACAS/TAS	TAS	Not fitted
Alert	None	N/A
Separation		
Reported	10-20ft V/200m H	200ft V/0.5NM H
Recorded	0ft V/<0.1NM H	



THE PA32 PILOT reports that they took off from RW02. A right turn out was executed for a heading of 160° and a 500fpm climb. Just as they were past base leg on the RW20 threshold (on the dead side) they were informed by North Weald radio of the presence of the Spitfire approaching from the East. As they looked to their left the Spitfire was in their 10 o'clock 200-300m away approximately the same level, perhaps 10ft below and converging swiftly. They saw no attempt at avoidance. They banked very sharply to the right with an attempt to climb they were already slightly higher. The traffic was approaching from the left. Turning left to tuck behind was not feasible as it was too close. They noted that they have a Garmin G1000 with traffic system that alerts to transponding aircraft but not ADS-B. There was no traffic alert relating to the Spitfire although there was from other aircraft in the vicinity. This led them to the conclusion that the Spitfire was not transponding. The Spitfire passed safely just underneath their aircraft, but they did not see whether the other pilot took any avoiding action. A call to the radio controller after landing revealed that the Spitfire was approaching from Chelmsford heading west/south west. They presumed that the other pilot must have been positioning for a right base join for RW02. The circuit is left hand for RW02. There is no way (from the position of the incident) that they were attempting an overhead join or a crosswind join.

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

THE SPITFIRE PILOT reports that they were recovering to North Weald from the east and had been using the Southend listening squawk and monitoring the Southend radar frequency. On first contact with North Weald Radio they confirmed the airfield information that they had was correct and were informed of a Piper aircraft that was departing. They were descending gently from 1200ft QNH and searching for the departing Piper aircraft in the vicinity of North Weald. When they saw the Piper they were at 1000ft and it was in their right 2 o'clock at a range that they estimated was 1NM, very slightly low and in a shallow climb. They called that they were visual with the Piper aircraft and increased their

rate of descent aiming to level at 800ft, thus creating vertical deconfliction whilst remaining visual with the Piper. At this time it was clear that the pilot of the Piper aircraft had not seen them approaching. After a delay of approximately one second they saw the Piper violently roll and break right which must have immediately made them lose sight of the Spitfire. Thereafter they lost sight of the Piper aircraft and concentrated on their own join and landing. They perceived that there was no risk of collision but were concerned that the pilot of the Piper aircraft had not seen them until about 0.5NM, and that when they did, they chose to fly a manoeuvre that was unnecessarily violent and that put them unsighted immediately when vertical deconfliction would have been more appropriate. Shortly after landing they contacted the North Weald radio operator to discuss the event and pass on their contact details in case the Piper pilot wanted to discuss the issue. Although the Spitfire pilot was not on the North Weald frequency at the time, they were told that the Piper pilot was informed of their routing during the recovery and yet had still chosen to route outbound on a course that was likely to put them into conflict with the Spitfire's recovery routing and altitude.

The pilot assessed the risk of collision as 'None'.

THE NORTH WEALD AGO reports that on 16th July 2021 they were operating North Weald Radio from the VCR. At approximately 1147 the PA32 departed RW02 on a flight plan to [destination]. At the same time the Spitfire was returning to the airfield from an experience flight. The PA32 pilot made a right turn on take-off to put them on a route southbound, the Spitfire was coming inbound from the north-east. The PA32 was climbing and the Spitfire descending. From North Weald Tower this was happening behind the AGO, and as they turned round to check, they saw that the Spitfire was travelling considerably faster than the PA32 and that it would useful to both pilots, as their direction of travel might bring them in to conflict, if they advised the Spitfire of the PA32's position. They believed that they said 'Spitfire you are going to have a departing Saratoga pass in front of you'. Neither pilot responded but within seconds the PA32 was seen to make a very steep turn (to the right they believed) and the Spitfire appeared to steepen its decent. The Spitfire then proceeded to join for its run and break and right hand circuit and landed normally. The next communication with the PA32 pilot was when they transferred to Southend.

THE NORTH WEALD A/G ASSISTANT reports that they were acting as air ground assistant on the day of the incident. The following is how they remembered the incident:

> At 11:45 UTC [PA32 C/S] departed RW02 outbound for [destination]. The assistant activated their flight plan on take-off.
>
> The PA32 made an immediate right turn after take-off, continuing the turn onto a south-easterly heading.
>
> Meanwhile [Spitfire C/S] called inbound to the field in order to commence their run and break (Standard procedure for the Spitfires operating at North Weald).
>
> The assistant looked out of the rear window of the tower to see if a conflict was likely to occur. They informed the radio operator that it might be quite close.
>
> The radio operator informed the Spitfire of the outbound traffic and said that they may pass in front of them.
>
> Seconds later they observed [PA32 callsign] making an aggressive right-hand turn presumably to avoid the conflict. At the same time the [Spitfire C/S] appeared to descend on the same track.
>
> Once the conflict was resolved [PA32 C/S] continued on a south easterly track towards Stapleford and [Spitfire C/S] continued onto their run and break.
>
> [PA32 C/S] then changed frequency to Southend Radar and [Spitfire C/S] landed safely at North Weald.

Factual Background

The weather at Southend was recorded as follows:

```
METAR EGMC 161120Z 01009KT 330V040 CAVOK 21/12 Q1026=
```

Analysis and Investigation

UKAB Secretariat

Although North Weald operates with A/G only and does not provide surveillance radar services, the incident could be seen on the NATS radars. At 1145:41 (Figure 1) the Spitfire was 4NM east of North Weald, having just passed VRP Chipping Ongar, indicating 1000ft. The PA32 appeared on the radar for the first time indicating 400ft. By 1145:50 (Figure 2) the PA32 pilot had started their turn onto a southerly heading and the two aircraft were 3NM apart.

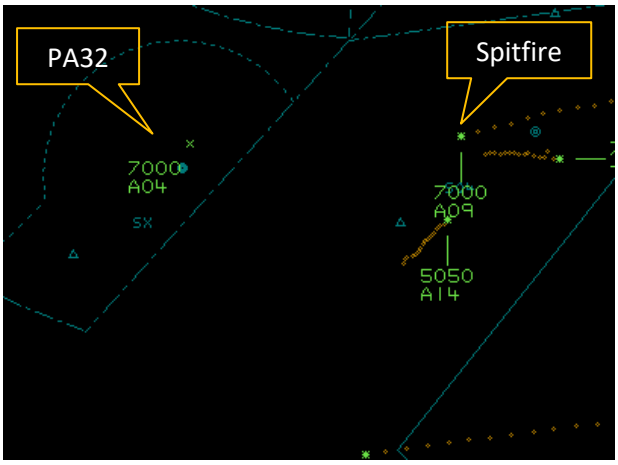


Figure 1

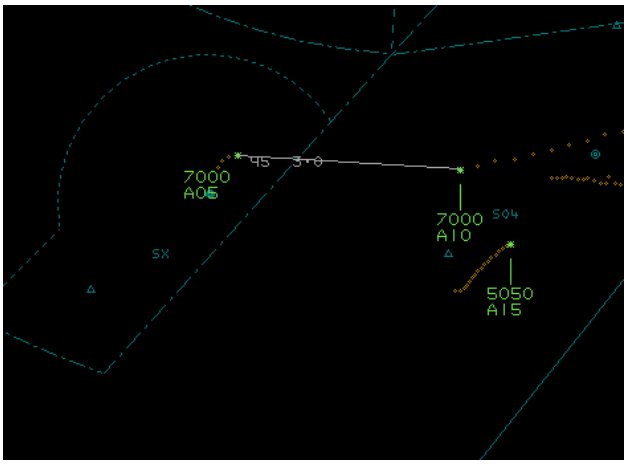


Figure 2

The two aircraft continued to close and at 1146:16 were 1.2NM apart (Figure 3), the Spitfire pilot reported becoming visual with the PA32 when about 1NM away with the PA32 in their 2 o'clock. The PA32 indicated 800ft still climbing. At Figure 4 the two aircraft were 0.2NM apart, with the Spitfire indicating slightly above, although it should be remembered that the radar altitude tolerances are +/- 200ft. CPA occurred at 1146:34 (Figure 5) with both aircraft indicating a similar level and less than 0.1NM separation.

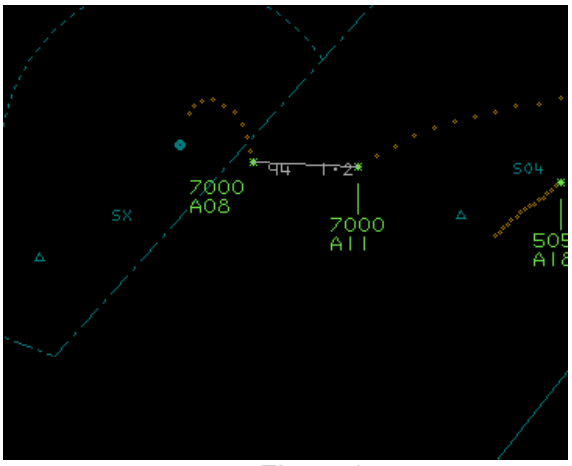


Figure 3

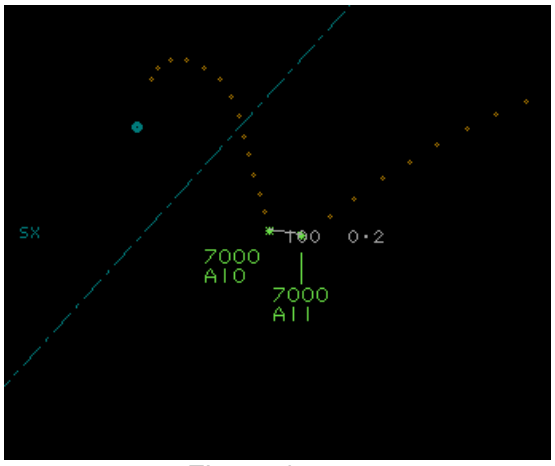


Figure 4

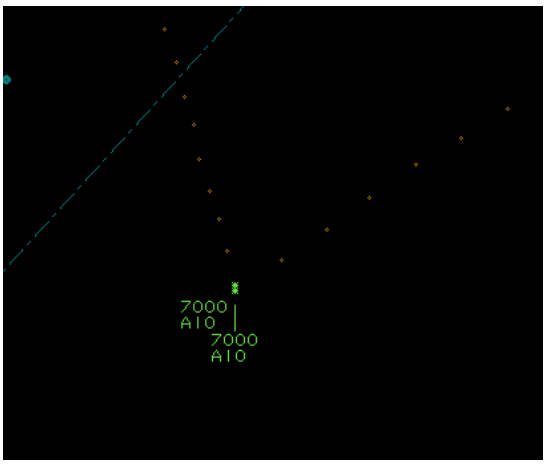


Figure 5 - CPA

The PA32 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.[1] If the incident geometry is considered as converging then the Spitfire pilot was required to give way to the PA32.[2]

Summary

An Airprox was reported when a PA32 and a Spitfire flew into proximity in the vicinity of North Weald at 1146Z on Friday 16th July 2021. Both pilots were operating under VFR in VMC, both were in receipt of an AGCS from North Weald.

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 AGO involved. 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 looked at the actions of the PA32 pilot. They were departing to the south and were given Traffic Information about the Spitfire joining the circuit, providing them with generic situational awareness, however they did not expect it to be at circuit height (**CF3**). In their report, the pilot noted that their TAS did not alert to the Spitfire and surmised that the Spitfire was not transponding, but in fact this was not the case, the transponder could be seen on the NATS radars, that being said, it was not known why the TAS did not alert as expected (**CF4**) and the Board could only assume it was due to aerial blanking. Having received the Traffic Information from the AGO, the pilot looked to the east for the Spitfire and saw it, 200-300m away at a similar level, which the Board considered to be a late sighting (**CF5**). The PA32 pilot then took avoiding action by turning right.

Turning to the Spitfire pilot, they were also given generic Traffic Information that the PA32 was departing (**CF3**). Members noted that the pilot reported becoming visual with the PA32 at 1NM and they thought that at this stage the Spitfire pilot had the opportunity to take early action, perhaps by altering course slightly, because it was for the Spitfire pilot to give way to the PA32 on their right (**CF1**). They wondered whether the pilot was concentrating on the join for the run and break and therefore did not assimilate that it was their responsibility to give way to the PA32 (**CF2**) and expected the PA32 pilot to route around the Spitfire, despite not knowing whether the other pilot was visual with them or not. Indeed, having reported visual, the Spitfire pilot seemed surprised that the PA32 pilot continued on track, and, from examining the radar data, it appeared as though their avoiding action (reported as an increased descent) was taken at a late stage (**CF6**). Members wondered whether the Spitfire pilot was used to flying in formation and therefore was not concerned by the reduced separation, but advised pilots that

[1] (UK) SERA.3205 Proximity.
[2] (UK) SERA.3210 Right-of-way (c)(2) Converging. MAA RA 2307 paragraph 12.

flying defensively, and avoiding other aircraft by a margin that all pilots would be comfortable with, would ensure a margin for error in case the other pilot were to suddenly manoeuvre unexpectedly.

The Board briefly looked at the actions of the AGO but noted that they were not required to sequence or separate the circuit traffic, and that the Traffic Information they provided was enough to enable both pilots to see the other aircraft. Therefore, the Board agreed that there were no contributory factors to assign to the AGO.

When assessing the risk, members took into consideration both pilots' reports and the radar data. They discussed the differing assessment from both pilots, the Spitfire pilot's assessment that there had been no risk of collision was probably predicated on the fact that they had been visual with the PA32 for a while, whereas the PA32 pilot saw the Spitfire at the last moment and took sudden avoiding action leading them to assess the risk as 'high'. However, taking into consideration the radar separation and noting that if the PA32 pilot had manoeuvred unpredictably the Spitfire pilot would have had very little time to alter course, members thought that safety had not been assured; Risk Category B (**CF7**).

Subsequent to the Board meeting, members were made aware that the following NOTAM was in effect at the time of the Airprox, detailing the Spitfire operations at North Weald:

```
AFP2414 150751
GG EGQSZXGO EGQSZXHO EGTTZDZM EGTTZRZN EGUBYWYO EGUBZGZX EGUBZXAO EGULYWYO
EGULZXAG EGULZXBO EGULZXCG EGUNYWYO EGUNYWYP EGUNZXAS EGUNZXCO EGUUYVYX
EGUWYWYO EGUWZGZX EGUWZXDF EGVAYWYO EGVAYWYP
150751 EUECYIYN
(H4264/21 NOTAMN
Q) EGTT/QWELW/IV/BO /AW/000/015/5143N00009E006
A) EGSX B) 2107150730 C) 2107181800
D) 0730-1800
E) INCREASED AERIAL ACTIVITY WI 5NM 514318N 0000915E (NORTH WEALD
AD, ESSEX). OPPOSITE CIRCUITS BEING USED BY 1 AND OR 2 SPITFIRES AT
EGSX INCLUDING RUN AND BREAKS AND FORMATION PLEASURE FLIGHTS TO THE
EAST. FOR INFO 123.530 / 01992 564200. 2021-07-0494/AS1
F) SFC G) 1500FT AMSL)
```

In light of this information, the actions of the PA32 pilot were reassessed, as members wondered whether the NOTAM should have provided a warning to the PA32 pilot that the Spitfire was conducting unusual operations. However, it was agreed that although it was not known whether the PA32 pilot had read the NOTAM, it did not alter the fact that the PA32 pilot saw the Spitfire late and that the Spitfire pilot had been visual with the PA32 for some time. Therefore it was agreed that there were no new contributory factors and all other contributory factors remained extant.

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

Contributory Factors:

	2021113			
CF	**Factor**	**Description**	**ECCAIRS Amplification**	**UKAB Amplification**
	Flight Elements			
	• Regulations, Processes, Procedures and Compliance			
1	Human Factors	• Use of policy/Procedures	Events involving the use of the relevant policy or procedures by flight crew	Regulations and/or procedures not complied with
	• Situational Awareness of the Conflicting Aircraft and Action			

2	Human Factors	• Incomplete Action	Events involving flight crew performing a task but then not fully completing that task or action that they were intending to carry out	Pilot did not sufficiently integrate with the other aircraft despite Situational Awareness
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
	• 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	Contextual	• Loss of Separation	An event involving a loss of separation between aircraft	Pilot flew into conflict
	• 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.

Safety Barrier Assessment[3]

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

Flight Elements:

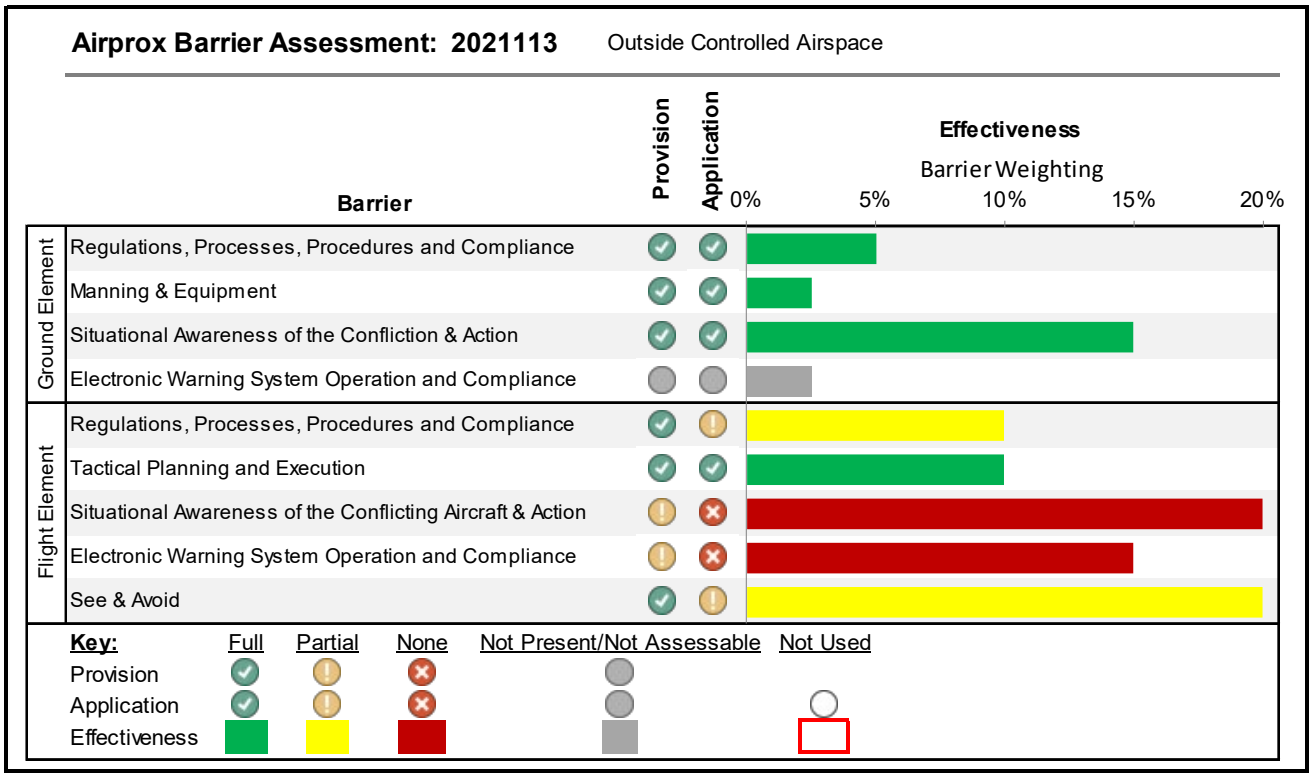
Regulations, Processes, Procedures and Compliance were assessed as **partially effective** because the Spitfire pilot did not give way to the PA32 on their right.

Situational Awareness of the Conflicting Aircraft and Action were assessed as **ineffective** because neither pilot had specific information on the other aircraft.

Electronic Warning System Operation and Compliance were assessed as **ineffective** because the TAS in the PA32 did not alert to the Spitfire.

See and Avoid were assessed as **partially effective** because the PA32 pilot saw the Spitfire late and the Spitfire pilot continued on track despite being visual with the PA32.

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


Airprox Barrier Assessment: 2021113
Outside Controlled Airspace
Barrier
Provision
Application
Effectiveness
Barrier Weighting
0%
5%
10%
15%
20%
Ground Element
Regulations, Processes, Procedures and Compliance
Manning & Equipment
Situational Awareness of the Confliction & Action
Electronic Warning System Operation and Compliance
Flight Element
Regulations, Processes, Procedures and Compliance
Tactical Planning and Execution
Situational Awareness of the Conflicting Aircraft & Action
Electronic Warning System Operation and Compliance
See & Avoid
Key:
Full
Partial
None
Not Present/Not Assessable
Not Used
Provision
Application
Effectiveness