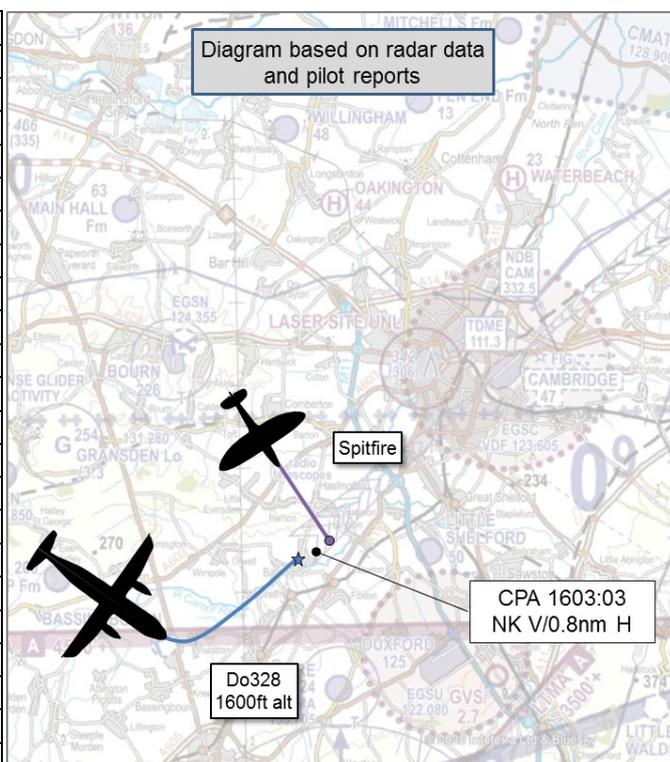


AIRPROX REPORT No 2019285

Date: 19 Sep 2019 Time: 1603Z Position: 5207N 00002E Location: 7nm SW Cambridge

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	Do328	Spitfire
Operator	CAT	Civ FW
Airspace	London FIR	London FIR
Class	G	G
Rules	NK	VFR
Service	Procedural	None
Provider	Cambridge	Duxford
Altitude/FL	1600ft	NK
Transponder	A, C, S	Not displayed ¹
Reported		
Colours	Company	Brown, Green
Lighting	Not reported	Not reported
Conditions	VMC	VMC
Visibility	Not reported	>10km
Altitude/FL	1500ft	Manoeuvring
Altimeter	QNH	QNH
Heading	050°	NK
Speed	Not reported	180kt
ACAS/TAS	TCAS II	Not fitted
Alert	None	N/A
Separation		
Reported	Not reported V/100-200ft H	Not seen
Recorded	NK V/0.8nm H	



THE CAMBRIDGE APPROACH OJTI CONTROLLER reports that at 15:59 the Do328 called Cambridge outbound for the NDB approach RW05. At this time, the screen controller saw a Spitfire operating on the outbound track without secondary radar displaying, but then it departed that area to the west. As the Do328 established on the Final Approach Track (FAT) the screen controller saw the Spitfire track towards Duxford from the west. He took control from the trainee and started to pass traffic information to the Do328 pilot on the Spitfire. He thinks he passed Traffic Information 3 times on the Spitfire to the Do328 pilot. He observed the Spitfire to the NW of the FAT by about 2nm, height estimated to be about 3000ft. He saw the Spitfire from the VCR and additional information from the ATM, the Spitfire then entered a high-speed dive and crossed ahead of the Do328 at about 0.5nm at a very similar level. The OJTI believes that the speed of the Spitfire was not accurately represented on the radar display because of the vertical vector component.

THE Do328 PILOT reports that it was a day with very nice flying conditions there was a significant amount of VFR and glider activity in and around Cambridge airport. To minimize cockpit workload, they chose to fly a full procedure NDB approach to RW05 which was the runway in use at Cambridge. FMS overlay and AP were on. They were handed over to Cambridge Approach approximately 3mins before reaching CAM NDB. Approach gave them information about known traffic and that it was a Procedural Service and cleared them to continue for the procedure. At this point there was no traffic to affect their approach apart from known glider activity at Gransden Lodge which is about 12nm west of Cambridge. They proceeded CAM outbound, descending 1600ft, keeping a good lookout for any gliders. When base turn was completed they were at 1600ft when Approach informed them about traffic approaching from the north. Looking out to the left they had visual contact with an aircraft that seemed to be no factor [UKAB note: not the reported Spitfire], this aircraft corresponded to an aircraft showing on their TCAS

¹ The Spitfire pilot reported that his aircraft was fitted with a Transponder mode A, C and S. At no time prior to the Airprox or after was any Transponder information visible on the radar replay.

about 4nm out and approximately 400ft above their level, they reported traffic in sight and continued the approach. Approach again gave them Traffic Information about the traffic the controller had seen from the tower but, looking out, the Do328 crew did not have any visual contact except on the previously mentioned traffic. At 5.5nm they started their final descent and, at approximately 1500ft, they saw the traffic crossing their final track diagonally NW to SE about 100-200ft above them. The traffic did not show on their TCAS and was apparently not in radio contact with Cambridge. It did not appear the pilot had seen them either as he made no climb or turn. After landing they talked to the Approach controller via telephone, he had noticed the traffic earlier performing manoeuvres around Cambridge and he had therefore kept a lookout for it. They were informed by him it was a Spitfire.

THE SPITFIRE PILOT reports that he believes the Airprox was filed by Cambridge ATC. He has no recollection of seeing another aircraft on that day that could be close enough to be considered an Airprox. He usually changes from the Duxford frequency and monitors the Cambridge frequency during the week in case there is any traffic using the easterly runway. He was sorry that he couldn't be more helpful with the Airprox investigation.

Factual Background

The weather at Cambridge was recorded as follows:

```
METAR EGSC 191550Z 05004KT 340V110 CAVOK 21/09 Q1030
```

Analysis and Investigation

Cambridge ATC Investigation Report

Cambridge Approach was operating with a controller and a trainee. At 15:56 the Do328 pilot reported on frequency and was issued with a Procedural service and asked what type of approach they required. They requested, and were cleared for, an NDB for RW05. The Do328 pilot reported CAM outbound at 15:58 and final approach track established at 16:02. The OJTI took control from his student, exercised his duty of care, and called the Do328 pilot to inform them that "You may have Spitfire traffic approaching you from the left, no height information, primary only contact", this was acknowledged. This was quickly updated with "Believe that Spitfire is crossing your Final Approach Track, high, left to right", which was again acknowledged. This was further updated as "Visual from the control tower crossing your 12 o'clock now just to the right of your approach", the Do328 pilot reported visual. After landing the Do328 pilot reported to Cambridge Tower that the spitfire "was 200ft or 100ft above our level". The Do328 pilot phoned ATC on shutting down his aircraft and spoke to the OJTI informing of his intention to file an Airprox, stating that in his opinion it was a very close call.

The following recommendations were made by Cambridge:

1. APS to be open for published operating hours.
2. Adding a pilot's information and briefing section to the new Cambridge Airport website in an attempt to raise awareness. This section could contain information on the importance of contacting Cambridge ATC along with other relevant airport information.
3. Adding an entry into the AIP encouraging pilots to contact Cambridge ATC if they intend to fly through the overhead or final approaches.
4. Engage with the CAA to ascertain the likelihood of establishing a TMZ/RMZ and assess the impact on operations.

UKAB Secretariat

The Do328 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.² If the incident geometry is considered as converging then the Spitfire pilot was required to give way to the Do328.³

The Do328 pilot completes the Base-Leg turn as the Spitfire is crossing the extended centreline (Figure 1). The controller passes Traffic Information on the Spitfire to the Do328 pilot.

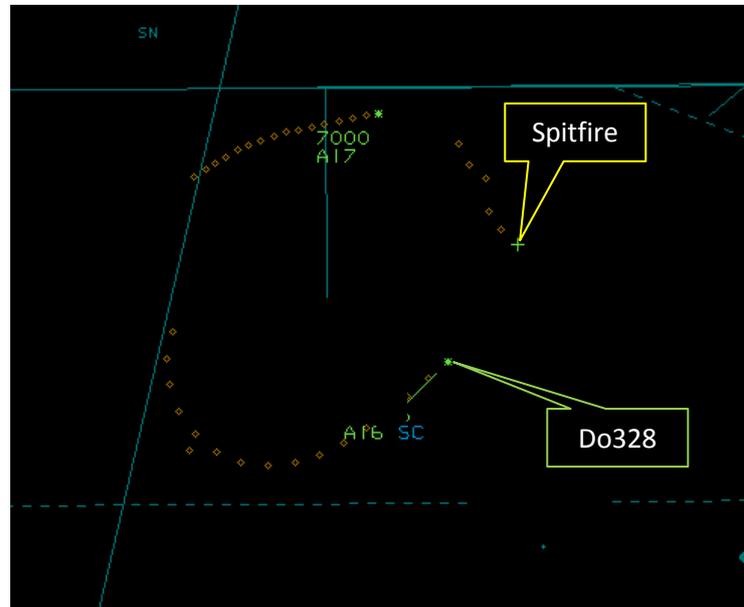


Figure 1: 1602:51 aircraft separated by 1.6nm

The Spitfire pilot flies through the 12 o'clock of the Do328 (Figure 2).

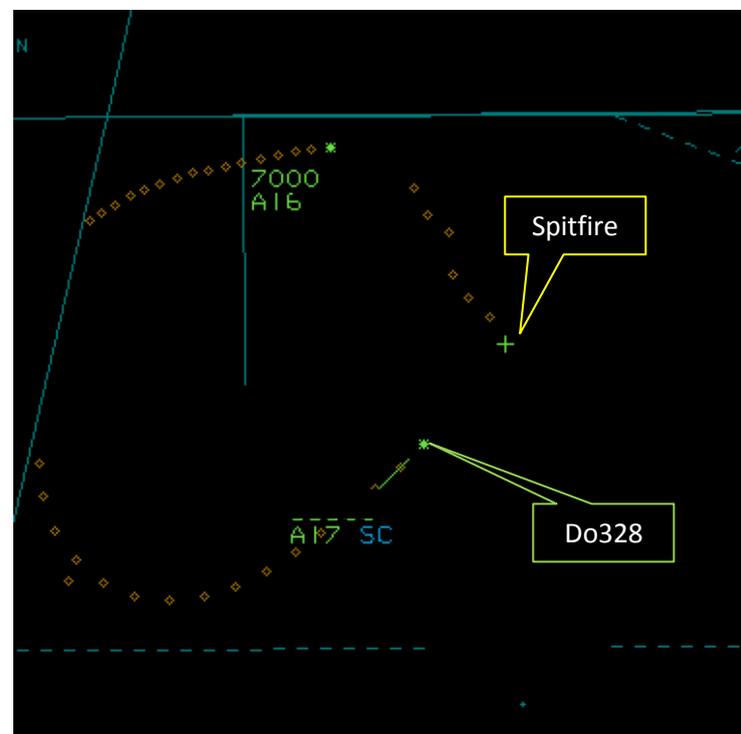


Figure 2: 1602:37 aircraft separated by 1.2nm

² SERA.3205 Proximity.

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

At CPA the Spitfire has flown through the 12 o'clock of the Do328 (Figure 3). The Spitfire does not display any Transponder information prior to or after CPA.

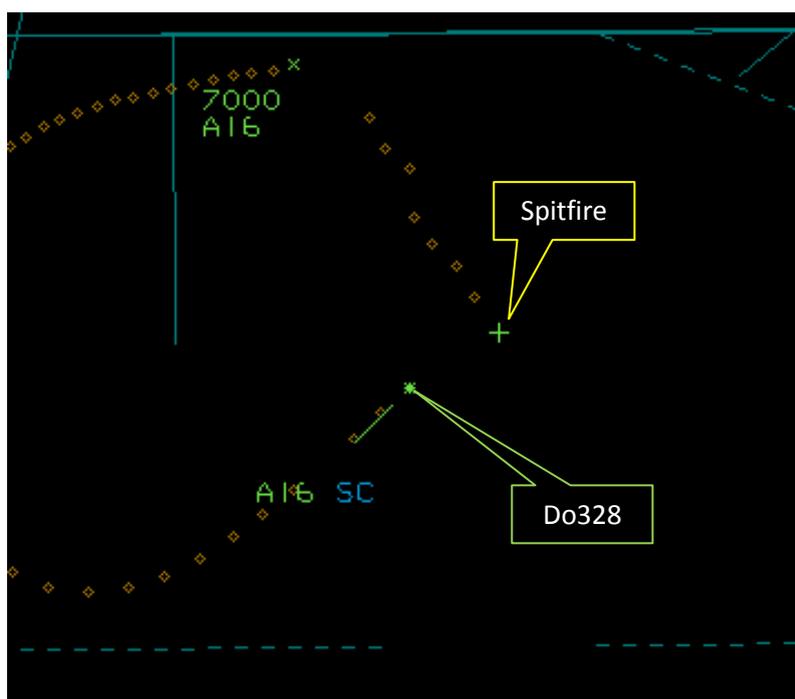


Figure 3: CPA 1603:03 aircraft separated by 0.8nm

Summary

An Airprox was reported when a Do328 and a Spitfire flew into proximity 7nm SW of Cambridge at 1603hrs on Thursday 19th September 2019. Both pilots were operating in VMC, the Do328 pilot in receipt of a Procedural Service from Cambridge Approach and the Spitfire pilot not in receipt of a service.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from both pilots, radar photographs/video recordings and reports from the air traffic controller 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.

Due to the exceptional circumstances presented by the coronavirus pandemic, this incident was assessed as part of a 'virtual' UK Airprox Board meeting where members provided a combination of written contributions and dial-in/VTC comments. Although not all Board members were present for the entirety of the meeting and, as a result, the usual wide-ranging discussions involving all Board members were more limited, sufficient engagement was achieved to enable a formal assessment to be agreed along with the following associated comments.

The Board began by looking at the actions of the Spitfire pilot. Although he had reported his transponder as on and functional there was no indication of any data from the radar recordings (**CF3**); members commented that it appeared that either his recollection was inaccurate or the Spitfire's transponder was unserviceable. He had been operating in an area known to him and, although Cambridge don't operate on RW05 often, he should have been aware of the instrument approach on that runway; with a surface wind of 050° it was highly likely that RW05 would be the in-use runway. Members commented that, given his experience and local knowledge it had been unwise of him to transit through an approach path that was clearly marked by the feathers on the chart (**CF1**) without communicating with the appropriate ATS (**CF2 & 4**). In doing so, in their opinion he had flown into conflict with the Do328 (**CF6**).

Turning to the actions of the Do328 pilot, members noted that he had received adequate Traffic Information and believed he was visual with the conflicting aircraft but had misidentified another aircraft as the Spitfire due to the TCAS II indications. When he saw the Spitfire it was closer than he realised, and passing through his 12 o'clock. Members commented that, whilst electronic warning systems were an excellent aid to situational awareness, pilots should not rely solely on the information provided by these systems and should ensure it corresponds with other sources of information, Traffic Information or visual acquisition of the conflict. As it was, the lack of any transponder data from the Spitfire resulted in the Do328 pilot having no electronic warning system information about the Spitfire (**CF5**) which, had it been present, would probably have enabled the Do328 pilot to gain visual contact with the Spitfire earlier than he did. Members opined that this was a good example of the hazards presented when airline operations are carried out in uncontrolled Class G airspace, there is little or no protection from other airspace users who are not receiving a service from the same unit. This is especially pertinent when operating with an ATS that does not provide a surveillance radar service, and members highlighted that airline operators should ensure their risk assessments fully capture the high possibility of conflict with unknown airspace users in such circumstances.

The Board then looked at the actions of the Cambridge controller. He had been providing a Procedural Service and had seen the Spitfire from the window and passed suitable Traffic Information for the Do328 pilot to gain visual contact with the Spitfire. Whilst commending him for his pro-active controlling, members commented that it was disappointing that, in what was a busy GA environment, Cambridge still didn't provide a full surveillance radar service during their operating hours.

The Board then looked at the risk and quickly agreed that although the separation was such that there had been no risk of collision, safety had been reduced below the norm as a result of the Spitfire's lack of transponder output and the fact that its pilot had chosen to fly through the Cambridge approach path without communicating with them. Accordingly, they assessed the risk as Category C.

PART C: ASSESSMENT OF CONTRIBUTORY FACTOR(S) AND RISK

Contributory Factor(s):

	2019285		
CF	Factor	Description	Amplification
	Flight Elements		
	• Regulations, Processes, Procedures and Compliance		
1	Human Factors	• Flight Crew ATM Procedure Deviation	Regulations/procedures not complied with
	• Tactical Planning and Execution		
2	Human Factors	• No Decision/Plan	Inadequate planning
3	Human Factors	• Transponder Selection and Usage	
4	Human Factors	• Communications by Flight Crew with ANS	Pilot did not communicate with appropriate service provider
	• Electronic Warning System Operation and Compliance		
5	Technical	• ACAS/TCAS System Failure	Incompatible CWS equipment
	• See and Avoid		
6	Human Factors	• Lack of Individual Risk Perception	Pilot flew close enough to cause the other pilot concern

Degree of Risk: C.

Safety Barrier Assessment⁴

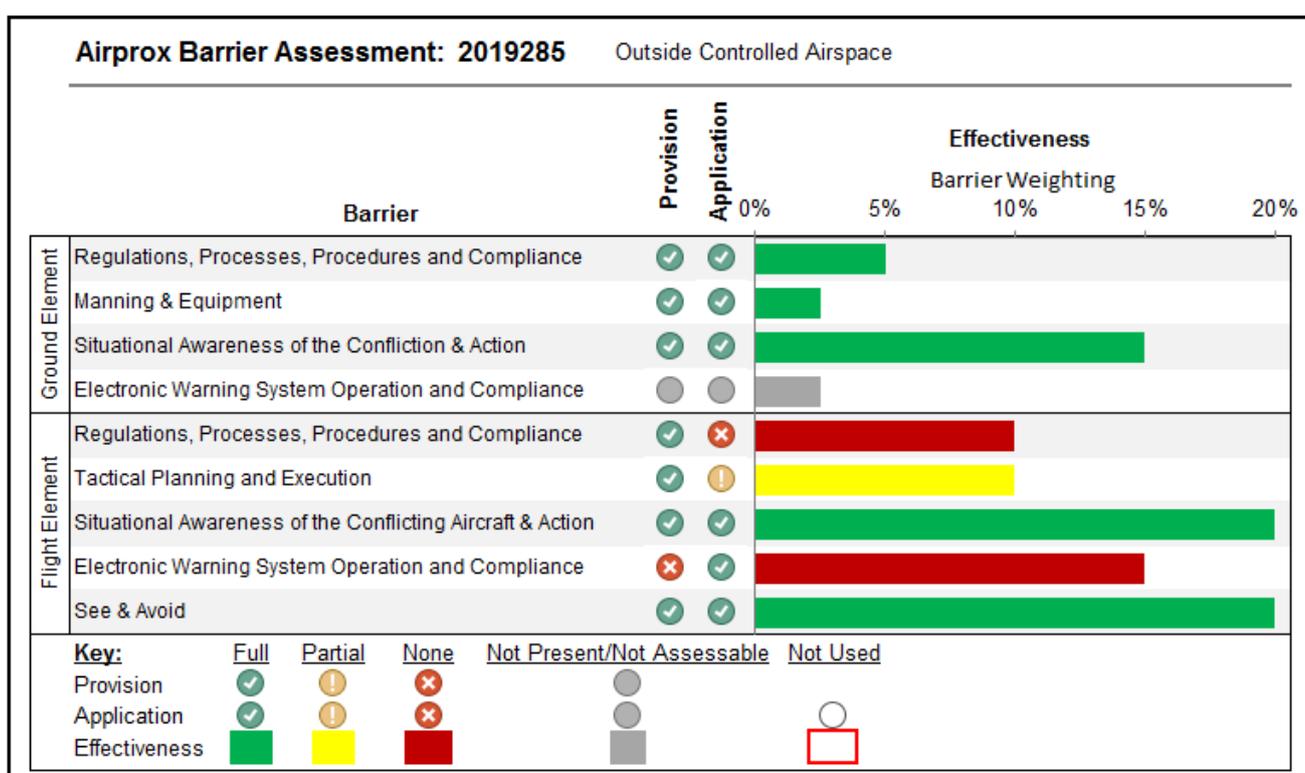
In assessing the effectiveness of the safety barriers associated with this incident, the Board concluded that the key factors had been that:

Flight Elements:

Regulations, Processes, Procedures and Compliance were assessed as **ineffective** because the Spitfire pilot was not transponding in accordance with EU Regulation SERA.13001.

Tactical Planning and Execution was assessed as **partially effective** because pilots are strongly advised to contact the aerodrome ATSU when transiting within 10nm of the IAP, which the Spitfire pilot did not do.

Electronic Warning System Operation and Compliance were assessed as **ineffective** because the Do328's TCAS II could not detect the non-transponding Spitfire.



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