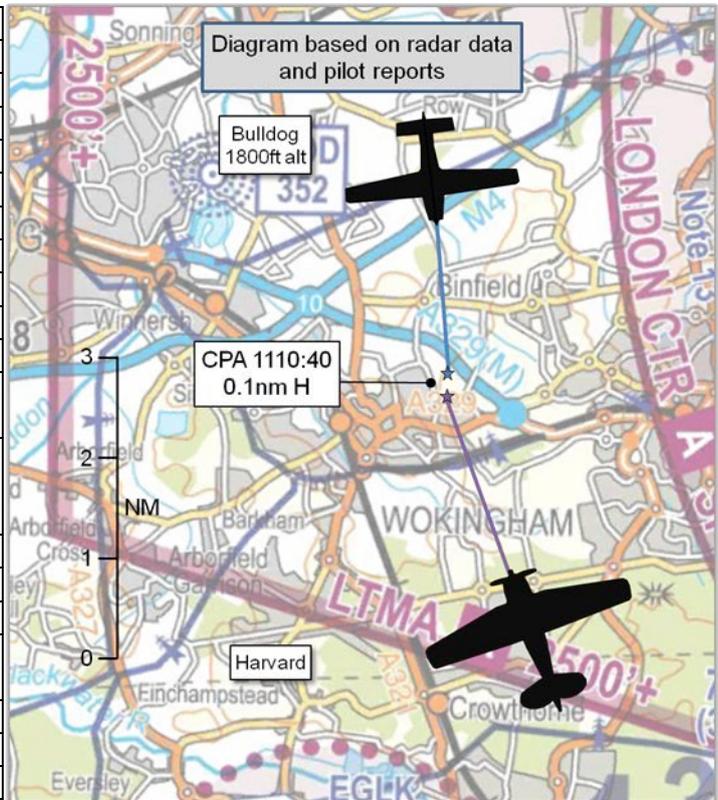


AIRPROX REPORT No 2016175

Date: 17 Aug 2016 Time: 1110Z Position: 5125N 00049W Location: 1nm W Bracknell

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	Bulldog	Harvard
Operator	Civ Pte	Civ Pte
Airspace	London FIR	London FIR
Class	G	G
Rules	VFR	VFR
Service	Basic	Basic
Provider	Farnborough	Farnborough
Altitude/FL	1800ft	NK
Transponder	A, C	A, S
Reported		
Colours	RAF Training markings	Blue
Lighting	Strobes, landing, nav, taxi	None
Conditions	VMC	VMC
Visibility	>10km	>30nm
Altitude/FL	1800ft	1800ft
Altimeter	QNH (1012hPa)	QNH
Heading	176°	360°
Speed	105kt	140kt
Separation		
Reported	100-200ft V/<0.25nm H	100ft V/500m H
Recorded	NK V/0.1nm H	



THE SCOTTISH AVIATION BULLDOG PILOT reports that on reaching 1800ft on QNH 1012hPa he contacted Farnborough Radar to request a Basic Service. He was given a new squawk, cleared on planned track to Farnborough and then advised “caution opposite traffic”. At that moment he observed a blue Harvard aircraft pass just below him and about 400-500m to starboard. The aircraft was in a 30° right bank towards him and appeared to be in an avoidance manoeuvre. He did not have time to take avoiding action as he visually acquired the aircraft too late. He commented that it was in hazy conditions with a bluish background; consequently, the blue aircraft was hard to see. The conflict occurred during him making a radio transmission.

He assessed the risk of collision as ‘High’.

THE HARVARD PILOT reports that his recollection was not that clear; he recorded what he thought happened but he was not confident of the details. He was flying around the western edge of the London CTR and would have been talking to Farnborough West in receipt of a Basic Service and squawking the assigned code. He thought he would have been flying at about 1800-2000ft on the QNH. He normally flies through the White Waltham ATZ, and so, at about Bracknell, he would call Farnborough for a temporary change of frequency to White Waltham. White Waltham was active, so he flew west of it rather than overhead. He was not sure exactly when he transferred to Farnborough North but usually soon after White Waltham. He was also not sure when he passed the Bulldog, whether it was north or south of White Waltham. Assuming that the Bulldog pilot’s report is correct, then they passed each other south of the airfield and he assumed that he was still talking to Farnborough West. Either way, he recalled that he was aware of the Bulldog from the radio. He could not remember if he heard the Bulldog pilot transmit or if he had been advised of traffic by ATC.

He recalled looking out for the aircraft and soon seeing it at about 1-2nm on an approximately reciprocal course to him, but going to pass some distance (500m?) on his right. He was passing on his right-hand side so he turned slightly left to increase separation, but no avoiding action was required. There appeared to be no apparent reaction from the Bulldog pilot.

He assessed the risk of collision as 'None'.

Factual Background

The weather at Heathrow was recorded as follows:

METAR EGLL 171050Z 11009KT 9999 FEW040 23/12 Q1013=

Analysis and Investigation

CAA ATSI

At 1104:03 the Harvard pilot called Farnborough requesting a service. The controller asked the pilot to standby whilst a controller handover took place and at 1105:00 the incoming controller requested the details of the flight. The SSR code of 0433 was issued and a Basic Service agreed. The Harvard pilot was flying at an altitude of 1800ft and reported his intention to fly northbound around the western edge of the London CTR and then overfly White Waltham.

At 1110:16 the Bulldog pilot called Farnborough passing abeam of Bracknell intending to route via the overhead at Farnborough, also at 1800ft. A Basic Service was agreed, the Farnborough controller immediately issued Traffic Information about the opposite direction traffic (the Harvard) and a code of 0460 was issued. Following the read-back of the SSR code the Bulldog pilot reported the traffic in sight.

The CPA occurred at 1110:38 (Figure 1) when both aircraft were at the same reported altitude and they were 0.1nm laterally apart.

The controller was not required to monitor the Harvard as only a Basic Service was being provided. However, as soon as the controller became aware of the potential confliction, Traffic Information was given to the Bulldog as communication was in progress with this aircraft¹. There was not time to issue Traffic Information to the Harvard pilot because the aircraft had already passed each other when the Bulldog pilot finished transmitting and reported the traffic in sight. Neither aircraft reported the Airprox on the frequency, therefore ATC did not know that an Airprox had been reported and, consequently, no unit report was available.

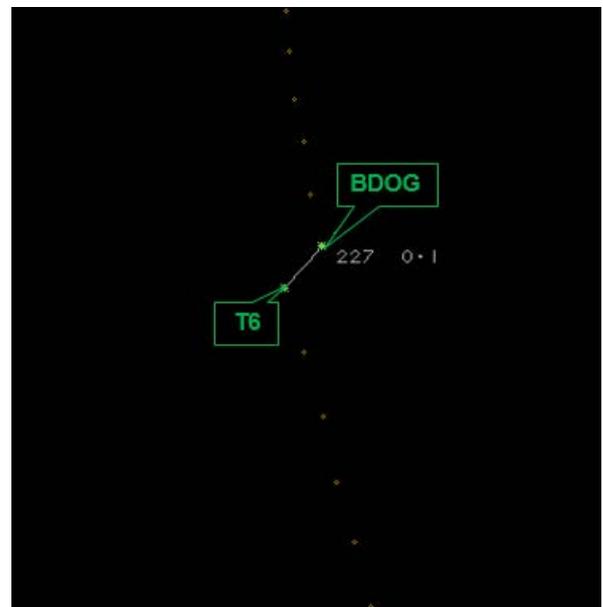


Figure 1 -1110:38 (T6 is the Harvard).

¹ CAP774 - If a controller/ FISO considers that a definite risk of collision exists, a warning shall be issued to the pilot (SERA.9005(b)(2) and GM1 SERA.9005(b)(2)). Whether traffic information has been provided or not, the pilot remains responsible for collision avoidance without assistance from the controller.

UKAB Secretariat

The Bulldog and Harvard pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard². If the incident geometry is considered as head-on or nearly so then both pilots were required to turn to the right³.

Summary

An Airprox was reported when a Bulldog and a Harvard flew into proximity at 1110 on Wednesday 17th August 2016. Both pilots were operating under VFR in VMC, and were both in receipt of a Basic Service from Farnborough Radar. Traffic information was issued to the Bulldog pilot who sighted the Harvard pass below on his right. The Harvard pilot reported seeing the Bulldog at a range of 1-2nm.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from both pilots, area radar recordings and reports from the appropriate ATC and operating authorities.

The Board noted that both pilots were operating under VFR in VMC outside CAS. The Harvard pilot was tracking north towards his destination. He had contacted Farnborough LARS, been allocated a squawk and a Basic Service had been agreed.

Some five minutes after the Harvard pilot's call to Farnborough, the Bulldog pilot established communication with Farnborough on the same frequency. He was on a reciprocal track to the Harvard, reportedly at a similar altitude and a Basic Service was agreed. The controller, although not identifying the Bulldog, was sufficiently aware of its position and proximity to the Harvard that he passed the Bulldog pilot Traffic Information about it. The Bulldog pilot reported that he had then seen the Harvard pass just below him. The Board commended the prompt actions of the Farnborough controller; realising the close proximity of the two aircraft he had quickly passed Traffic Information to the Bulldog pilot which might have allowed him at least some chance of conducting avoiding action. It was unfortunate that the aircraft had been so close that avoiding action was not really possible, and that the controller had not had time to pass reciprocal information to the Harvard pilot. However, under a Basic Service, the Harvard pilot should not have been expecting the provision of Traffic Information, and it appeared that he had seen the Bulldog sufficiently far away that he was able to adjust his track anyway.

The Board then looked at the barriers that were relevant to this Airprox and decided that the following were key contributory factors:

- **Ground-Based Safety Nets** was considered **ineffective** because there was no system available despite both aircraft squawking.
- **Flight Crew Situational Awareness** was **partially effective** because it appeared that the Harvard pilot was aware of the Bulldog but did not assimilate that there was a risk of collision.
- **Onboard Warning/Collision Avoidance Equipment** was **inapplicable** because neither aircraft was fitted with the equipment. The Board agreed that because both aircraft were transponding, if this barrier had been available to at least one of the pilots it could have alerted them to the presence of the other aircraft early enough to carry out actions to increase separation.
- **See and Avoid** was **partially effective** because both pilots saw the other late.

² SERA.3205 Proximity.

³ SERA.3210 Right-of-way (c)(1) Approaching head-on.

The Board then turned its attention to the cause and risk of the Airprox. The Board considered that because both pilots were operating in Class G airspace it was their responsibility to 'see and avoid' each other. The Harvard pilot reported that he had seen the Bulldog at a range of 1-2nm but the Board noted that his recollection of the event was somewhat vague because he had not been aware that an Airprox had been reported until sometime after the event. Although it was apparent that he had seen the Bulldog, the Board were not sure at what range, and given the reported hazy conditions by the Bulldog pilot, thought it might have been closer than reported. The Bulldog pilot had effectively not seen the Harvard until it had passed him. Consequently, it was agreed that the Airprox had occurred because of a late sighting by the Harvard pilot and an effective non-sighting by the Bulldog pilot. Although the Harvard pilot had reported there was no risk of a collision, the Bulldog pilot reported that the risk of collision was high. The Board also noted that they had passed 0.1nm apart at similar altitudes and therefore considered that safety margins had been reduced well below the norm. Accordingly, the Airprox was assessed as risk Category B.

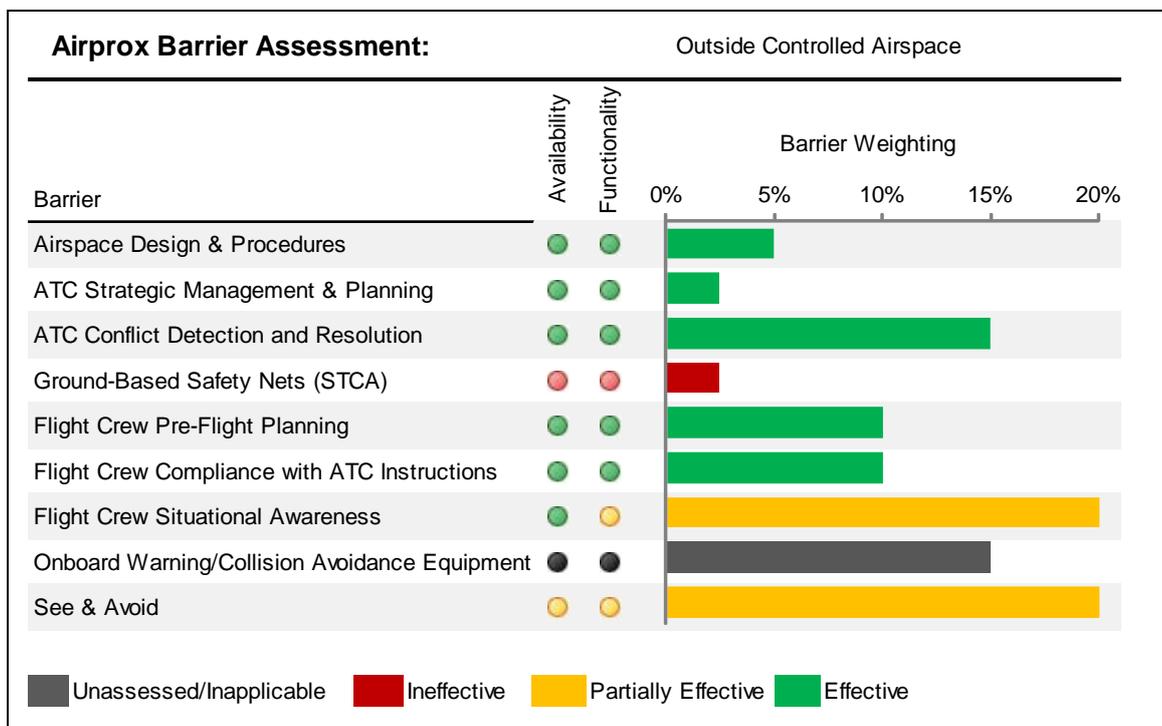
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A late sighting by the Harvard pilot and effectively a non-sighting by the Bulldog pilot.

Degree of Risk: B.

Barrier Assessment:

Modern safety management processes employ the concept of safety barriers that prevent contributory factors or human errors from developing into accidents. Based on work by EASA, CAA, MAA and UKAB, the following table depicts the barriers associated with preventing mid-air-collisions. The length of each bar represents the barrier's weighting or importance (out of a total of 100%) for the type of airspace in which the Airprox occurred (i.e. Controlled Airspace or Uncontrolled Airspace).⁴ The colour of each bar represents the Board's assessment of the effectiveness of the associated barrier in this incident (either Fully Effective, Partially Effective, Ineffective, or Unassessed/Inapplicable). The chart thus illustrates which barriers were effective and how important they were in contributing to collision avoidance in this incident.



⁴ Barrier weighting is subjective and is based on the judgement of a subject matter expert panel of aviators and air traffic controllers who conducted a workshop for the UKAB and CAA on barrier weighting in each designation of airspace.

Barrier Effectiveness		Consequence		
		Non-functional	Partially Functional	Functional
Availability		1	2	3
Completely Unavailable	1	1	2	3
Partially Available	2	2	4	6
Available	3	3	6	9

Key:

	Effective
	Partially Effective (If the system was partially available but fully functional score availability as 2.5)
	Ineffective
	Unassessed/Inapplicable

Barrier	Availability			Functionality			Unassessed / Inapplicable
	Fully (3)	Partially (2)	Not Available (1)	Fully (3)	Partially (2)	Non Functional (1)	
Airspace Design and Procedures	Appropriate airspace design and/or procedures were available	Airspace design and/or procedures were lacking in some respects	Airspace design and/or procedures were not appropriate	Airspace design and procedures functioned as intended	Airspace design and/or procedures did not function as intended in some respects	Airspace design and/or procedures did not function as intended	The Board either did not have sufficient information to assess the barrier or the barrier did not apply; e.g. ATC Service not utilised. Note: The Board may comment on the benefits of this barrier if it had been available
ATC Strategic Management and Planning	ATM were able to man and forward plan to fully anticipate the specific scenario	ATM were only able to man or forward plan on a generic basis	ATM were not realistically able to man for or anticipate the scenario	ATM planning and manning functioned as intended	ATM planning and manning resulted in a reduction in overall capacity (e.g. bandboxed sectors during peak times)	ATM planning and manning were not effective	
ATC Conflict Detection and Resolution	ATS had fully serviceable equipment to provide full capability	ATS had a reduction in serviceable equipment that resulted in a minor loss of capability	ATS had a reduction in serviceable equipment that resulted in a major loss of capability	The controller recognised and dealt with the conflict in a timely and effective manner	The controller recognised the conflict but only partially resolved the situation	The controller was not aware of the conflict or his actions did not resolve the situation	
Ground-Based Safety Nets (STCA)	Appropriate electronic warning systems were available	Electronic warning systems is not optimally configured (e.g. too few/many alerts)	No electronic warning systems were available	Electronic warning systems functioned as intended, including outside alerting parameters, and actions were appropriate	Electronic warning systems functioned as intended but actions were not optimal	Electronic warning systems did not function as intended or information was not acted upon	
Flight Crew Pre-Flight Planning	Appropriate pre-flight operational management and planning facilities were deemed available	Limited or rudimentary pre-flight operational management and planning facilities were deemed available	Pre-flight operational management and planning facilities were not deemed available	Pre-flight preparation and planning were deemed comprehensive and appropriate	Pre-flight preparation and/or planning were deemed lacking in some respects	Pre-flight preparation and/or planning were deemed either absent or inadequate	
Flight Crew Compliance with Instructions	Specific instructions and/or procedures pertinent to the scenario were fully available	Instructions and/or procedures pertinent to the scenario were only partially available or were generic only	Instructions and/or procedures pertinent to the scenario were not available	Flight crew complied fully with ATC instructions and procedures in a timely and effective manner	Flight crew complied later than desirable or partially with ATC instructions and/or procedures	Flight crew did not comply with ATC instructions and/or procedures	
Flight Crew Situational Awareness	Specific situational awareness from either external or onboard systems was available	Only generic situational awareness was available to the Flight Crew	No systems were present to provide the Flight Crew with situational awareness relevant to the scenario	Flight Crew had appropriate awareness of specific aircraft and/or airspace in their vicinity	Flight Crew had awareness of general aircraft and/or airspace in their vicinity	Flight Crew were unaware of aircraft and/or airspace in their vicinity	
Onboard Warning/Collision Avoidance Equipment	Both aircraft were equipped with ACAS/TAS systems that were selected and serviceable	One aircraft was equipped with ACAS/TAS that was selected and serviceable and able to detect the other aircraft	Neither aircraft were fitted with ACAS/TAS or their systems were not selected on or unserviceable or systems incompatible	Equipment functioned correctly and at least one Flight Crew acted appropriately in a timely and effective manner	ACAS/TAS alerted late/ambiguously or Flight Crew delayed acting until closer than desirable	ACAS/TAS did not alert as expected, or Flight Crew did not act appropriately or at all	
See and Avoid	Both pilots were able to see the other aircraft (e.g. both clear of cloud)	One pilots visibility was uninhibited, one pilots visibility was impaired (e.g. one in cloud one clear of cloud)	Both aircraft were unable to see the other aircraft (e.g. both in cloud)	At least one pilot takes timely action/inaction	Both pilots or one pilot sees the other late and one or both are only able to take emergency avoiding action	Neither pilot sees each other in time to take action that materially affects the outcome (i.e. the non-sighting scenario)	