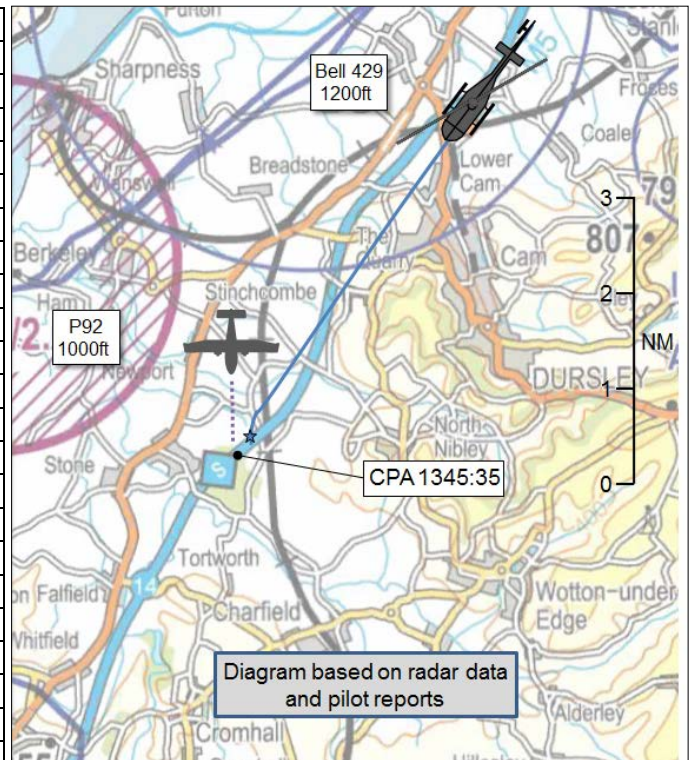


AIRPROX REPORT No 2016174

Date: 18 Aug 2016 Time: 1345Z Position: 5139N 00225W Location: Newport, Gloucestershire

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	B429	Tecnam P92
Operator	HEMS	Civ Pte
Airspace	London FIR	London FIR
Class	G	G
Rules	VFR	VFR
Service	Basic	None
Provider	Bristol	
Altitude/FL	FL012	NK
Transponder	A, C, S	Not fitted
Reported		
Colours	Yellow, Green	White, blue
Lighting	Strobes, Nav	None
Conditions	VMC	VMC
Visibility	8km	20km
Altitude/FL	1200ft	1000ft
Altimeter	RPS (1010hPa)	NK
Heading	190°	175°
Speed	130kt	65kt
ACAS/TAS	TCAS I	Not fitted
Alert	None	N/A
Separation		
Reported	100ft V/300m H	50ft V
Recorded	NK	



THE B429 PILOT reports that he was flying in southerly direction when he was alerted by the left-hand seat non-pilot crewman about traffic to the right; the right-hand door spar was obscuring the approaching aircraft. He made a left-hand descending turn, and the rear crew-member noted the registration of the other aircraft. There appeared to be no reaction from the other aircraft, so he believed that the other pilot had not seen him.

He assessed the risk of collision as 'High'.

THE TECNAM P92 MICROLIGHT PILOT reports that she took off from a private strip, levelled at 500ft to improve vision, and then made a 90° turn on to a westerly heading and climbing further. She then turned onto a southerly heading, still climbing gently. Her first sighting of the helicopter was after it passed underneath from behind and climbed up ahead of her aircraft. She did not have to take avoiding action.

She assessed the risk of collision as 'Low'.

Factual Background

The weather at Bristol was recorded as follows:

EGGD 181320Z AUTO 12004KT 9999 OVC036 21/15 Q1010=

Analysis and Investigation

CAA ATSI

At 1343:47, the B429 contacted Bristol Radar and reported that they were airborne from Stonehouse routing to South Mead Hospital in Bristol at altitude 1200ft and requested a Basic Service. A Basic Service was agreed by the Bristol Radar controller and the pilot was instructed to report landing. At 1345:44, the B429 was observed to have made a descending left-turn consistent with the avoiding action stated in the pilot's written report. The aircraft then returned to the previously observed track and level. No conflicting traffic was observed on the area-surveillance recordings.

The Bristol Radar controller was providing a Basic Service to the B429 in Class G (uncontrolled) airspace. A Basic Service relies on the pilot avoiding other traffic, unaided by controllers/FISOs. The provider of a Basic Service is not required to monitor the flight (and) pilots should not expect any form of traffic information from a controller¹.

There are some inconsistencies with the B429 pilot's report; in his written report he stated that the Airprox occurred at 1446 whilst the helicopter was routing from Devizes, Wiltshire to a field location at Stonehouse, Gloucestershire. He reported heading 190° towards Bristol at the time the Airprox occurred however, routing from Devizes to Stonehouse would require a track of approximately 330°. At 1446, the B429 was observed to be approximately 6nm south-east of Swindon tracking south-west at altitude 1500ft, at this time no conflicting traffic was observed on the area surveillance recordings and the B429 was not in communication with Bristol Radar, therefore it was surmised that the incident in fact took place at 1345.

UKAB Secretariat

The B429 and Tecnam P92 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 overtaking then the P92 pilot had right of way and the B429 pilot was required to keep out of the way of the other aircraft by altering course to the right³, additionally an aircraft that is obliged to keep out of the way of another shall avoid passing over, under or in front of the other unless it passes well clear⁴

Summary

An Airprox was reported when a B429 and a Tecnam P92 flew into proximity at 1345 on Thursday 18th August 2016. Both pilots were operating under VFR in VMC, the B429 pilot in receipt of a Basic Service from Bristol and the P92 pilot not in receipt of an ATS.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from the pilots of both aircraft, transcripts of the relevant RT frequencies, radar photographs/video recordings, and reports from the appropriate ATC operating authorities.

In looking at the actions of the B429 pilot first, the Board noted that the pilot hadn't seen the Tecnam earlier due to the door strut, and that it had been the crewman who had alerted him to the other aircraft. Notwithstanding the value of having another set of eyes looking out the cockpit, members thought that this served as a timely reminder to pilots that thorough look-out should take into account any known blind-spots within the cockpit by pro-actively moving one's head to overcome any obscuration. Having been alerted and seen the Tecnam late, members agreed that the pilot then

¹ CAP774, Chapter 2, Para 2.1 & 2.5

² SERA.3205 Proximity.

³ SERA.3210 Right-of-way (c)(3) Overtaking.

⁴ SERA.3210 Right-of-way (c).

took appropriate avoiding action by descending and turning away left rather than trying to pass by on the right as would be expected if an earlier sighting had been made. The Board wondered whether the pilot, quite understandably, had become task focused in being keen to get his patient to the hospital as quickly as possible and perhaps conducting activities in cockpit at the expense of prioritising lookout; the Tecnam was there to be seen, and in Class G airspace with only a Basic Service from ATC, good look-out was vital. The Board noted that although the B429 was fitted with a TCAS, because the Tecnam did not have a transponder it was effectively invisible to TCAS and did not show on the ATC radar either (meaning that the controller could not have given Traffic Information on it even if the B429 pilot had elected for a Traffic Service). Finally, noting the discrepancies in the timings of his report, the Board wished to remind pilots that by reporting an Airprox on frequency exact timings and locations are preserved by alerting the Air Traffic Controller that an incident has taken place; although the Tecnam was not visible on radar in this case, this also ensures that the correct radar recordings are saved.

Looking at the Tecnam pilot's actions, the Board thought that in practical terms there was very little that she could have done differently given that the much faster B429 had approached from her rear quarter; she probably couldn't have been expected to see it any earlier. That being said, some members opined that she may have been better placed in having attempted to contact Bristol LARS both to alert them to her presence and potentially receive Traffic Information, if only from other aircraft position reports. Members also noted that she saw the B429 well after its pilot had taken the avoiding action, and the Board thought that this probably accounted for the different risk perceptions of the two pilots.

In considering the effectiveness of the barriers relevant to this incident, the Board concluded that the key factors had been that:

- **Situational awareness** had been **ineffective** because the Tecnam's lack of transponder or any calls to ATC had meant that the B429 pilot could not be specifically aware of the Tecnam's presence through either ATC or his TCAS.
- **Onboard warning/collision warning systems** were assessed as **ineffective** for the same reason – Tecnam lack of transponder.
- **See-and-avoid** was assessed as only **partially effective** due to the lateness of sighting by the B429 pilot as a result of cockpit obscuration.

In discussing the cause of the Airprox, the Board quickly agreed that it was a late sighting by the B429 pilot. However, there was some discussion about the risk of the incident. Some Members thought that the B429 pilot had taken timely and effective avoiding action by achieving 300m separation as reported by himself; they opined that the risk should therefore be Category C. Other members noted that the Tecnam pilot reported that the B429 had flown underneath and, although they were not convinced this was entirely the case, they opined that this probably meant the B429 was much closer than 300m. After much discussion, and aware that there was no corroborating evidence either way other than the B429 pilot commenting that the risk of collision had been high, the Board agreed that the lateness of the sighting and associated need for the B429 pilot to avoid at the last minute by manoeuvring left and down (contrary to the expected right-hand overtaking rule) meant that safety had probably been much reduced below the norm and safety had not been assured; they therefore assessed the risk as Category B.

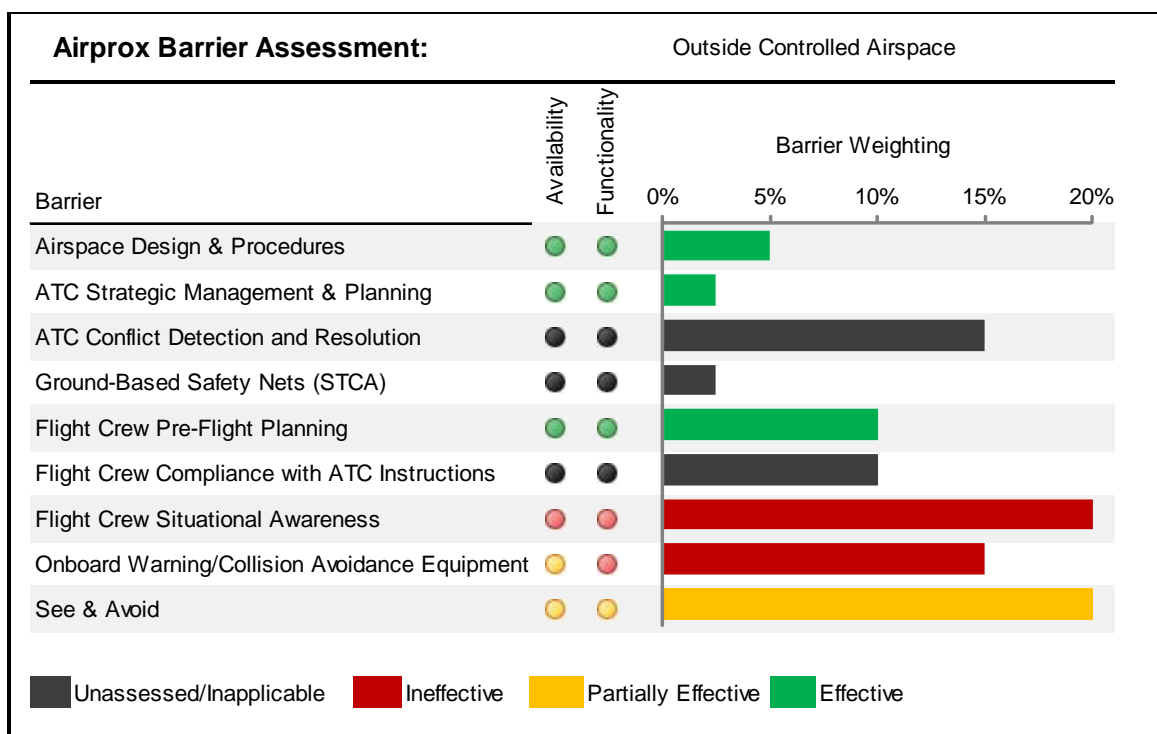
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A late sighting by the B429 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).⁵ 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.



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

⁵ 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	Availability			Functionality			Unassessable / Absent
	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. TCAS not fitted to either aircraft or 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	One aircraft was equipped with ACAS/TAS that was selected and serviceable but unable to detect the other aircraft (e.g. other aircraft not transponding)	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)	