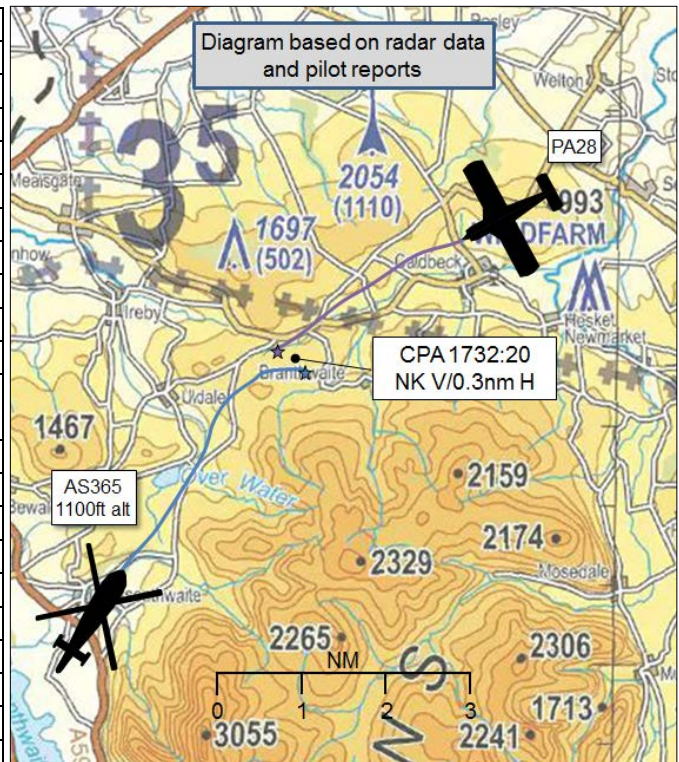


AIRPROX REPORT No 2016178

Date: 23 Aug 2016 Time: 1732Z Position: 5444N 00307W Location: N of Keswick

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	AS365	PA28
Operator	HEMS	Civ Trg
Airspace	London FIR	London FIR
Class	G	G
Rules	VFR	VFR
Service	Monitoring	Monitoring
Provider	London Info	Carlisle
Altitude/FL	1100ft	NK
Transponder	On, C	On, S
Reported		
Colours	White, Green, Yellow	White, Orange, Brown
Lighting	Nav, Strobe	Strobe
Conditions	VMC	VMC
Visibility	.10km	40km
Altitude/FL	1000ft	N/K
Altimeter	RPS (1017hPa)	N/K
Heading	025°	250°
Speed	145kt	100kt
ACAS/TAS	TCAS I	Not fitted
Alert	TA	N/A
Separation		
Reported	0ft V/100m H	100ft V/1nm H
Recorded	NK V/0.3nm H	



THE AS365 PILOT reports that he lifted from a HEMS site at Keswick and the crew’s main concerns were military fast-jet traffic that operate low-level south-to-north along the Derwent/Bassenthwaite valley; they therefore flew to the right of this valley in a climbing right turn for best speed to get around Skiddaw to the hospital. Once clear of the mountain and on track to the hospital, a Mode A TCAS icon was spotted to the 12 o’clock. The aircraft was at 2nm and closing but was not seen at this time. Because it was Mode A only (military low-level traffic tend to have Mode C), he elected to completed an avoiding right turn into an area that he could see was clear. While conducting this descending right-turn, the small fixed-wing aircraft was spotted by the front left-seat occupant (Medic/Nav) very close to the 10 o’clock below 1000ft agl. The small fixed-wing aircraft did not appear to see them and remained straight and level. At the time, the Doctor was out of the harness in the rear of the aircraft to attend to the patient, and was taken by surprise by this avoiding action.

He assessed the risk of collision as ‘High’.

THE PA28 PILOT reports that the helicopter flew around from the blindside of the mountain. He saw it and then the helicopter turned right, closer to the mountain side. He did not take any action as there was clearly no risk of collision at that point.

He assessed the risk of collision as ‘None’.

Factual Background

The weather at Carlisle was recorded as follows:

METAR EGNC 231550Z 30007KT 270V340 9999 SCT044 20/15 Q1019

Analysis and Investigation

CAA ATSI

The AS365 pilot reports obtaining a TCAS alert in the 12 o'clock position at a range of 2nm. (Figure 1). He then reported making a turn to the right into a known clear area and, during this time, the PA28 was sighted. This is evidenced on the radar recording and a CPA of 0.3nm was observed. (Figure 2). Neither aircraft were in receipt of an ATC service.

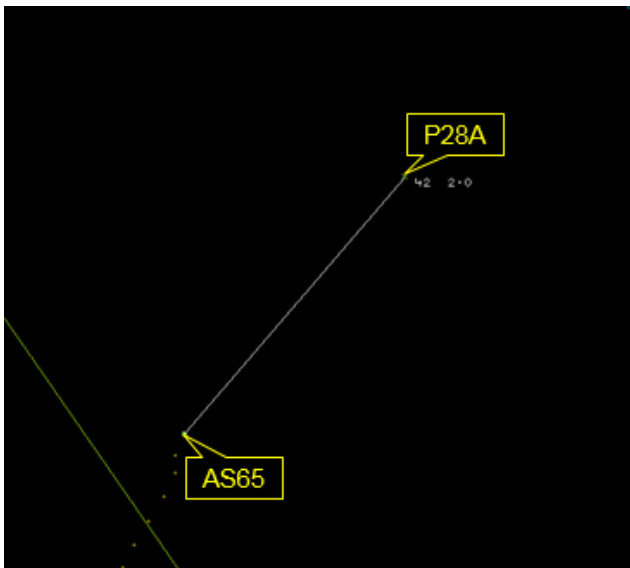


Figure 1 – 1732:06

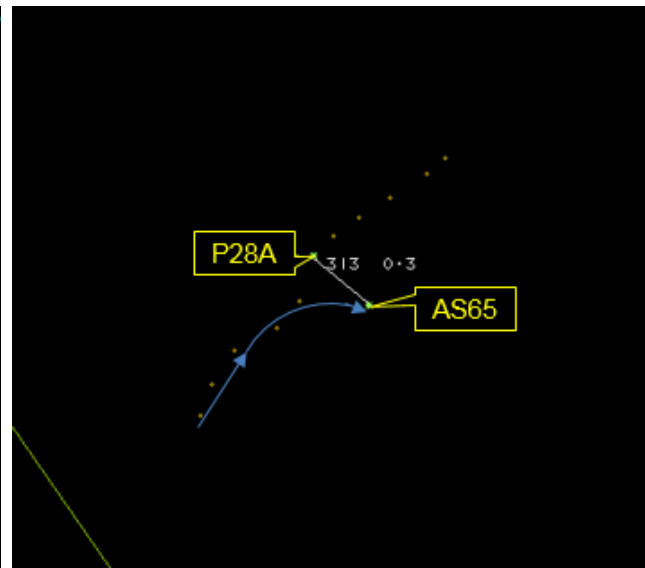


Figure 2 – 1732:37

UKAB Secretariat

The AS365 and PA28 pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard¹. If the incident geometry is considered as head-on or nearly so then both pilots were required to turn to the right².

Summary

An Airprox was reported when an AS365 and a PA28 flew into proximity at 1732 on Tuesday 23rd August 2016. Both pilots were operating under VFR in VMC, neither pilot in receipt of a Service.

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 and operating authorities.

The Board began by highlighting that in this situation, with an abundance of high ground in the area, it is difficult for pilots visually to gain situational awareness of other aircraft in their area. In this respect, members were advised by the RAF member that, following on from the trial in Scotland, efforts were underway to introduce a common VHF frequency for low-level flight throughout the UK, and the subsequent discussion highlighted the advantages of aircraft being then able to transmit their height and route to inform others and provide a greater known-traffic environment. The Board acknowledged that this would not always be fully functional, due to the nature of the terrain sometimes masking radio waves, but they agreed that it would be an improvement over the current situation for both military and civil users.

¹ SERA.3205 Proximity.

² SERA.3210 Right-of-way (c)(1) Approaching head-on.

The Board then moved on to the actions of the PA28 pilot and commented that, although the pilot was clearly complying with the ANO and rules of the air, flying at 1000ft or so in a busy military low-level training area may not have been prudent taking into account the nature of the terrain. Although there was clearly a balance to be made between risk and reward, the Board generally recommended that GA pilots avoid flying below 2-3000ft whenever possible in order to avoid the higher-threat low-level height band. Notwithstanding, the Board acknowledged that the PA28 pilot had seen the AS365 as it appeared from behind the high ground, and had been able to judge that the AS365 pilot's manoeuvre had resolved the conflict.

The Board then discussed whether the AS365 pilot could also have avoided the low-level height band and thus improved his chances of visual acquisition. The helicopter member opined that, because the Doctor was out of his seat this indicated that he was actively treating a casualty and, having just lifted from a HEMS site, the aircraft was ferrying a patient to a local hospital, which invariably required the helicopter to operate at a lower level for the safety of the patient. The Board highlighted the AS365 pilot's awareness of potential low-level military activity as evidence that he was well aware of the possibility of encountering other aircraft and was pro-actively taking steps to avoid likely conflicts. Finally, noting that the AS365 TCAS had alerted the pilot to the presence of the PA28, members agreed that this was a good example of the advantages of such equipment and the utility of aircraft operating with their transponders active at all times; the Board commended the AS365 pilot for promptly reacting to the presence of the TA and taking the avoiding action turn based on the information he received.

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

- **Flight Crew Situational Awareness** was considered only **partially effective** because the pilots were on different frequencies and the PA28 pilot had no means of receiving any information about the AS365. Whilst this can often be the case in Class G airspace, the Board felt that the availability and use of a VHF common frequency for low-level flights and transits in areas where air traffic services are limited would have increased the information available to both pilots regarding the other's presence.
- **Onboard Warning/Collision Avoidance Equipment** was assessed as being partially available because only one aircraft had the system fitted; however it was assessed as being **fully effective** because the PA28 was transponding and the AS365's system alerted the AS365 pilot to the proximity of the PA28.

The Board then considered the cause and risk of the incident and members quickly agreed that both pilots had seen each other as early as could have been expected in the circumstances. Notwithstanding the fact that the PA28 pilot felt that separation was adequate having seen the AS365 in a right-turn, some members felt that the PA28 could have turned right to increase the separation once he had sighted the AS365 given that he couldn't know the AS365 pilot's intentions. Ultimately, it had been the AS365 pilot's turn away from the PA28 on receipt of the TA that had effectively prevented any risk of collision, and the incident was therefore assessed as a conflict in Class G airspace resolved by the AS365 pilot. Turning to the risk, members agreed that although safety had been degraded there had been no risk of collision and so the Board assessed the risk as Category C.

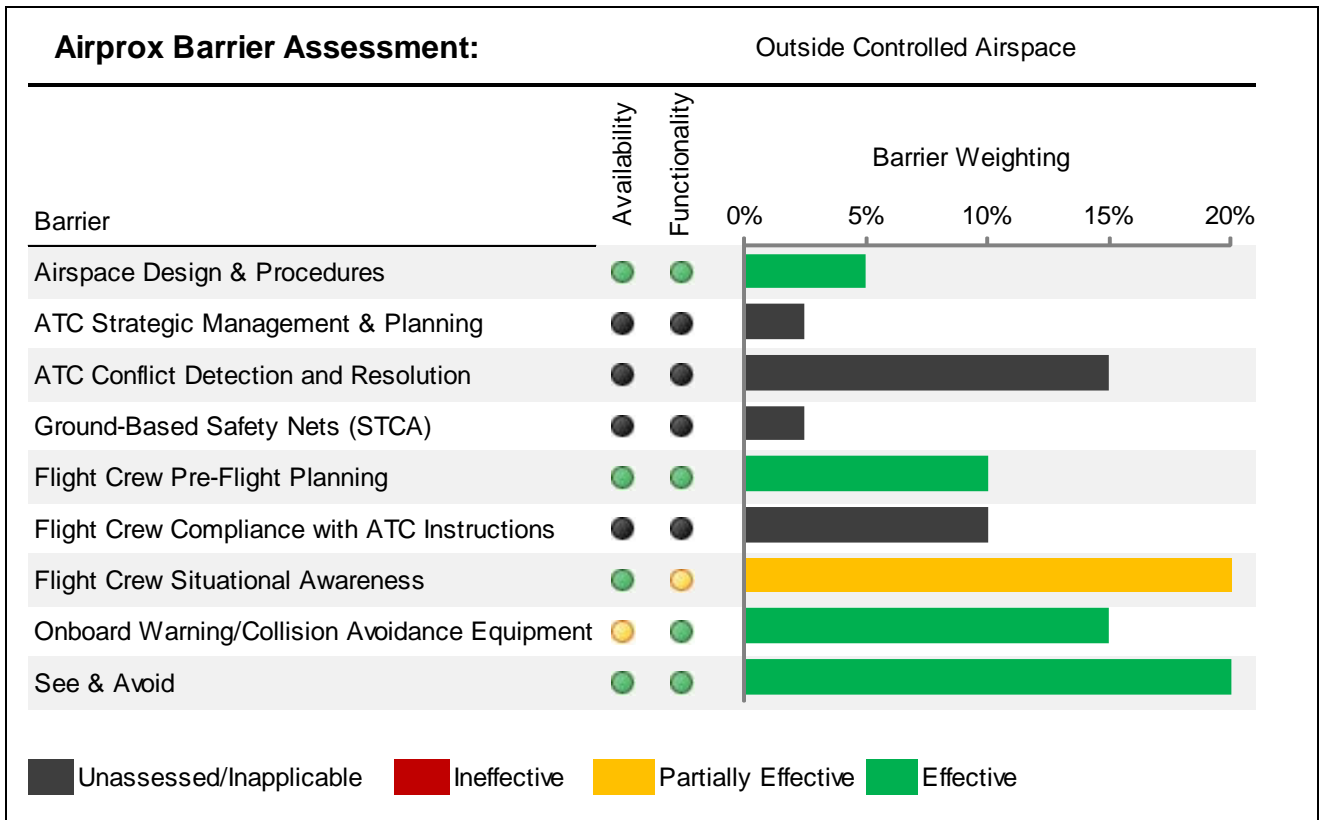
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A conflict in Class G airspace resolved by the AS365 pilot.

Degree of Risk: C.

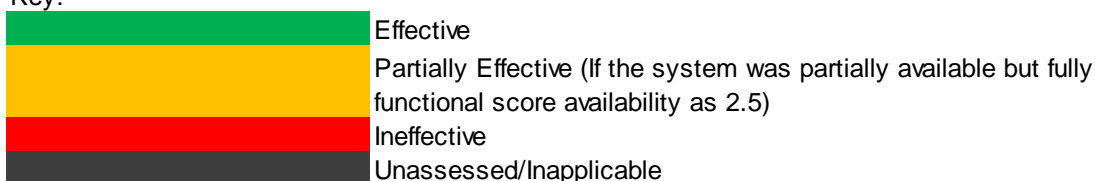
Barrier Assessment:

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).³ 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		Functionality		
		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:



³ 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	<p>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.</p> <p>Note: The Board may comment on the benefits of this barrier if it had been available</p>
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)	