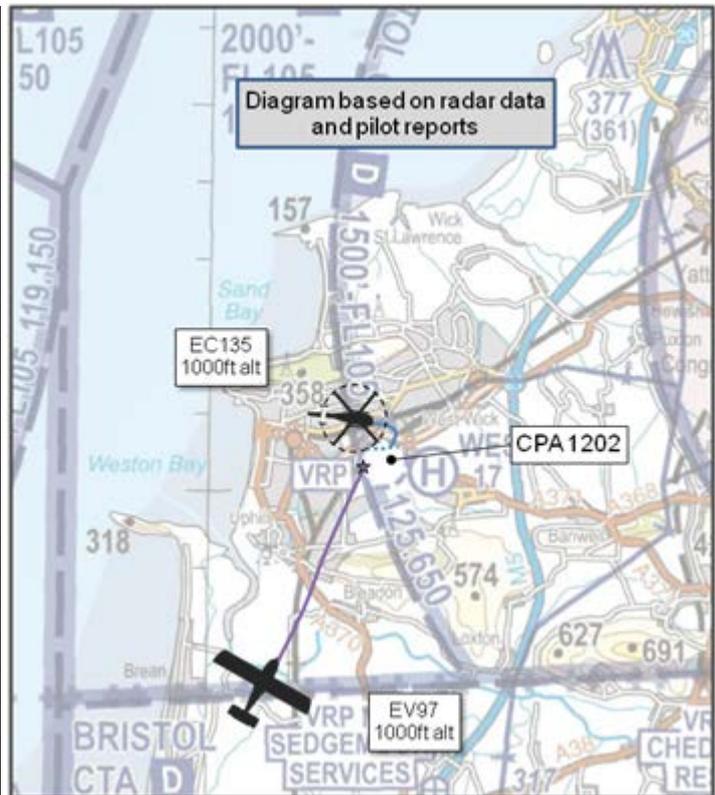


AIRPROX REPORT No 2016160

Date: 22 Jul 2016 Time: 1202Z Position: 5120N 00257W Location: Weston-Super-Mare

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	EC135	EV97
Operator	NPAS	Civ Pte
Airspace	London FIR	London FIR
Class	G	G
Rules	VFR	VFR
Service	Basic	Listening out
Provider	Bristol	Bristol
Altitude/FL	NK	FL010
Transponder		A/C/S
Reported		
Colours	NPAS	Silver with red stripes
Lighting	NK	None
Conditions	VMC	VMC
Visibility	NK	>10km
Altitude/FL	1000ft	1050
Altimeter	QNH	QNH (1018hPa)
Heading	NK	026°
Speed	40-60kt	90kt
ACAS/TAS	TCAS I	Not fitted
Alert	Unknown	N/A
Separation		
Reported	NK V/0m H	100ft V/0m H
Recorded		NK



THE EUROCOPTER EC135 PILOT reports that he was in an orbit (at 1000ft, 40-60kts) on task in the Weston-Super-Mare area in support of Officers on the ground for approx 20mins. He was in receipt of a Basic Service from Bristol ATC, operating under their CTA. He received a TCAS activation "5 o'clock, same level". Avoiding action was initiated, descending to 700ft in the turn, all crew had 'eyes out'. A low-wing aircraft (possibly a PA28) was seen by the front crew member through the disc in the descent directly overhead. The orbit was continued until the pilot was visual with the aircraft before climbing back to 1000ft to continue the task. The fixed-wing aircraft's pilot made no deviation from heading throughout. An Airprox was reported to Bristol ATC.

THE EV97 EUROSTAR MICROLIGHT PILOT reports that he was on a cross-country flight via Bridgwater, Weston Aerodrome, Clevedon and the Old Severn Bridge to his destination in South Wales. His first sighting of the helicopter was probably from an area just north of Burnham-on-Sea, his heading approximately 030°. The helicopter was ahead of him at a safe distance crossing from right to left at the same altitude. He held visual contact whilst holding straight-and-level and checked his ASI at approximately 100mph. The helicopter pilot adopted a hover, still at a safe distance and still at a matching altitude. The helicopter was in view 35° left of ahead. He remained vigilant to future movement. The helicopter appeared to be facing him whilst holding the hover. Although he thought it likely that its pilot had seen him he could not assume that was the case. The helicopter pilot then began a return from left to right still at a safe distance ahead and this time descending. He estimated that the helicopter would be clear of his track ahead and sufficiently to the right and below his current height. He changed direction a few degrees to the left. As he continued to hold the helicopter in view, its pilot adopted what seemed a banking right turn onto a track which would pass to his right at a lower height. Before their relative tracks became abeam, the helicopter's track continued further to his right so that their tracks overlapped though still maintaining vertical separation. At this point he fed in more power. The helicopter was now out of sight, last seen

moving beneath him obscured by the starboard wing and what he believed to be diagonally to his back left. Notably he was unable to see any further changes in height. Choosing not to make any further change in direction or any manoeuvre that might suddenly degrade his own height he had gone to full throttle to increase speed and distance. He was satisfied that he was clear of the helicopter but realised that its last movement suggested that he may not have been seen after all. This was confirmed when the helicopter pilot reported to Bristol Radar that an aeroplane had 'just flown over' him and he wished to report an Airprox, which was acknowledged by Bristol ATC. Now being sure that he was clear he was able to gain height for the water crossing from Portishead to the Old Severn Bridge, enroute to his destination.

He assessed the risk of collision as 'Low'.

THE BRISTOL APPROACH RADAR CONTROLLER reports that the EC135 was at Weston-Super-Mare at 1500ft under a Basic Service. The pilot reported that a light aircraft had overflown him by around 300ft. The pilot reported he would file an Airprox report because he had received a TCAS alert. He checked the light-aircraft's Mode S, identifying it as the subject EV97. The radar recording showed the 5077 return [the EV97] transiting the coast close to the track of the EC135, both were outside CAS.

Factual Background

The weather at Bristol was recorded as follows:

METAR EGGD 221150Z AUTO VRB03KT 9999 NCD 22/12 Q1019=

Analysis and Investigation

CAA ATSI

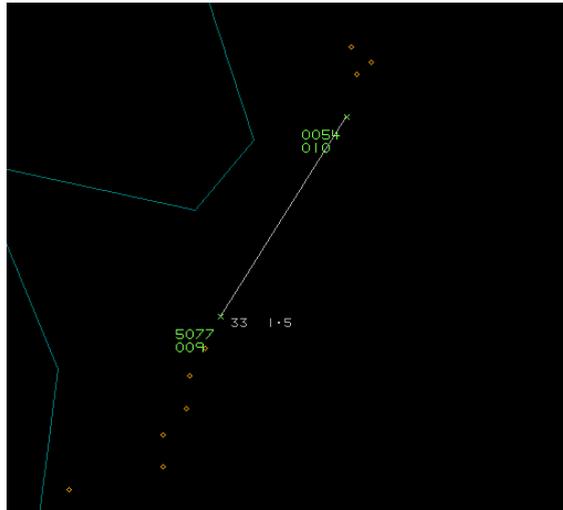
The EC135 helicopter pilot was operating VFR in the vicinity of Weston-super-Mare. At the time of the Airprox he was orbiting at 1000ft (on the Bristol QNH), at slow speed, and was in receipt of a Basic Service from Bristol Radar.

The EV97 pilot was operating VFR on a flight to South Wales. At the time of the Airprox he was not receiving an ATC service but was transponding the Bristol Airport Frequency Monitoring SSR code (sometimes referred to as a 'listening squawk'). Frequency Monitoring codes¹ are published for use close to the peripheries of certain controlled airspace in order to both prevent and mitigate the consequences of airspace infringements. Selection of a Frequency Monitoring code does not imply the provision of any form of Air Traffic Service and the use of such codes does not prevent a pilot from requesting an Air Traffic Service at any time should they subsequently decide they require one.

The EC135 pilot contacted Bristol Radar at 1125:04 approaching the island of Flat Holm en-route to Weston-super-Mare; a Basic Service was agreed outside of controlled airspace and the he was requested to report on task.

At 1201:37 (Figure 1) the EC135 (SSR code 0054) was visible as a Secondary Surveillance Radar contact indicating FL010. The EV97 (SSR code 5077) was also only visible as an SSR contact, and was 1.5nm south-south-west of the EC135, indicating FL009 tracking north-north-east. The EC135 then disappeared from SSR coverage. Due to the EC135 operating below the available SSR coverage it was not possible to determine the CPA using the area surveillance recordings.

¹ UK AIP ENR 1.6-6 2.2.5 Frequency Monitoring Codes



Swanwick MRT at 1201:37 EC135/0054 EV97/5077.

At 1203:06 the EC135 pilot called Bristol Radar to report an Airprox. He reported that a light-aircraft had passed overhead the helicopter at the same level triggering a TCAS alert. The EC135 pilot also described descending 300ft to avoid the traffic. The Bristol Radar controller acknowledged the report and went on to explain that the EC135 was not visible to him on his radar display but that he could see traffic north of Weston-Super-Mare transponding the Bristol listening squawk. The EC135 pilot then confirmed that this was the traffic that he had reported. The EV97 pilot did not call Bristol Radar; however, the pilot's written report indicates that he had heard the R/T exchange between the EC135 pilot and the Bristol controller regarding the Airprox.

The Bristol Approach Radar controller was providing a Basic Service to the EC135 pilot, who was operating below the Bristol CTA; the EC135 pilot was operating 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 controller².

UKAB Secretariat

The EC135 and EV97 pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard³. If the incident geometry is considered as head-on or nearly so then both pilots were required to turn to the right⁴. If the incident geometry is considered as overtaking then the EC135 pilot had right of way and the EV97 pilot was required to keep out of the way of the other aircraft by altering course to the right⁵.

Comments

NPAS

While not in any way removing the obligation to comply with the Rules of the Air and responsibility for effective lookout, the dynamic nature of Police tasks, which are often carried out at relatively low level, is worthy of being given a wide berth laterally if circumstances allow. Equally, operations at lower levels can preclude the use of Traffic and Deconfliction Services outside controlled airspace through radar performance, as does the perception of distraction from the task in hand in the minds of operating crews. Although an extra burden on both ATC and operating crews, NPAS will consider revising its operating procedures to ensure the highest level of ATC service, commensurate with the task and location, is requested.

² CAP774, Chapter 2, Para 2.1 & 2.5

³ SERA.3205 Proximity.

⁴ SERA.3210 Right-of-way (c)(1) Approaching head-on.

⁵ SERA.3210 Right-of-way (c)(3) Overtaking.

Summary

An Airprox was reported when an EC135 and an EV97 flew into proximity at 1202 on Friday 22nd July 2016. Both pilots were operating under VFR in VMC, the EC135 pilot in receipt of a Basic Service from Bristol and the EV97 pilot was listening out on the same Bristol frequency.

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 EC135 pilot was operating in the vicinity of Weston-Super-Mare on a police task at 1000ft in an orbital flight. The EV97 pilot was on a cross country flight routeing towards the Old Severn Bridge from the south at a similar altitude.

The actions of the EV97 pilot were discussed first. The Board noted that the pilot had selected the Bristol Airport Frequency Monitoring SSR code and commended him for so doing. He had monitored the Bristol Approach frequency but did not contact Bristol ATC to request a service and GA members wondered whether he might have usefully done so once he had sighted the EC135 so that he might gain an understanding of its pilot's intentions. In this respect, they also wondered whether the EV97 pilot might have thought that in adopting the listening squawk code he could expect ATC to monitor his squawk and to contact him with reference to the EC135's operation. ATC had no remit to do so, and members opined that the EV97 pilot should have taken the initiative to contact ATC when he had obtained a visual sighting of the EC135. This may have alerted the controller to the near presence of both aircraft, which would have allowed him to issue Traffic Information to the EC135 pilot, albeit that he was receiving a Basic Service. The EV97 pilot reported that he had first seen the EC135 when passing north of Burnham-on-Sea, about 4nm away. The Board opined that the EV97 pilot, having observed the EC135 in a fairly limited flight profile, could reasonably have concluded that it was carrying out a task of some sort and would have been better served by avoiding its operating area by a more considerable distance. A civil helicopter pilot member added that this was particularly important because the EC135 pilot, being engaged on a police task, had limited manoeuvrability and was liable to be task-focussed to some extent. Finally, the Board noted that the EV97 pilot had reported that he thought, from the helicopter's manoeuvring, that it was likely that the EC135 pilot would have seen him; noting that he himself had acknowledged that he could nevertheless not assume this was the case, some members wondered whether an anticipation that he would likely be seen may have influenced his decision-making. Members commented that pilots should never rely on the fact that the other pilot would see them; always assume the contrary and that their actions are therefore unpredictable in relation to your aircraft.

The Board noted that the EC135 pilot was in receipt of a Basic Service from Bristol and the civil helicopter pilot member agreed with the comments made by NPAS that, all things being equal, it might have been more appropriate for the pilot to have requested an upgraded ATC Service to assist him in being warned of conflicting traffic. He went on to comment that although a Traffic Service *per se* was not possible in this incident because the EC135 was operating below radar cover, he might have been able to inform the controller of his operating location if it was not going to change, and ask that the controller warn him of aircraft that might be coming into that area regardless of whether the controller could see the EC135 or not. That being said, the Board also recognised that there were operational reasons why the EC135 pilot may not wish to announce his operating location on the radio, so there was a fine balance between operating effectiveness and safety considerations.

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

- **Airspace Design and Procedures** was considered only **partially effective** because radar cover at the normal operating levels for traffic in this area often resulted in only intermittent

radar returns; this meant the controllers may not be able to provide the best service to aircraft in the area.

- **Onboard Warning/Collision Avoidance Equipment** was **effective** because it gave warnings to the EC135 pilot of an aircraft that he had not seen or been informed about.
- **See and Avoid** was **partially effective** because although both pilots saw each other, the EV97 pilot did not act to avoid the EC135 by a sufficient margin.

The Board then turned its attention to the cause and risk of the Airprox. The Board noted that the EC135 pilot reported that he had received a TCAS alert about the EV97, which had been at the same level. He had carried out a 300ft descent and a crew member had seen the aircraft directly overhead. For his part, the EV97 pilot had seen the EC135 at about 4nm out and, in the opinion of the Board, could have taken more positive action to route away from it. Some members argued that the EV97 pilot had effectively flown into conflict with the EC135, but others argued that it was not as clear-cut as this because the EC135 was manoeuvring and there was therefore a degree of uncertainty as to its pilot's intentions. In the end, it was decided that the Airprox had occurred because, although the EV97 pilot had obtained early visual contact with the helicopter, he had continued on track and flown sufficiently close enough to cause the EC135 pilot concern. Nevertheless, the Board considered that because the EC135 pilot had taken avoiding action and the EV97 pilot had had visual contact throughout (apart from in the very late stages as he overflew the EC135), there had been no risk of a collision. Accordingly the Airprox was assessed as risk Category C.

PART C: ASSESSMENT OF CAUSE AND RISK

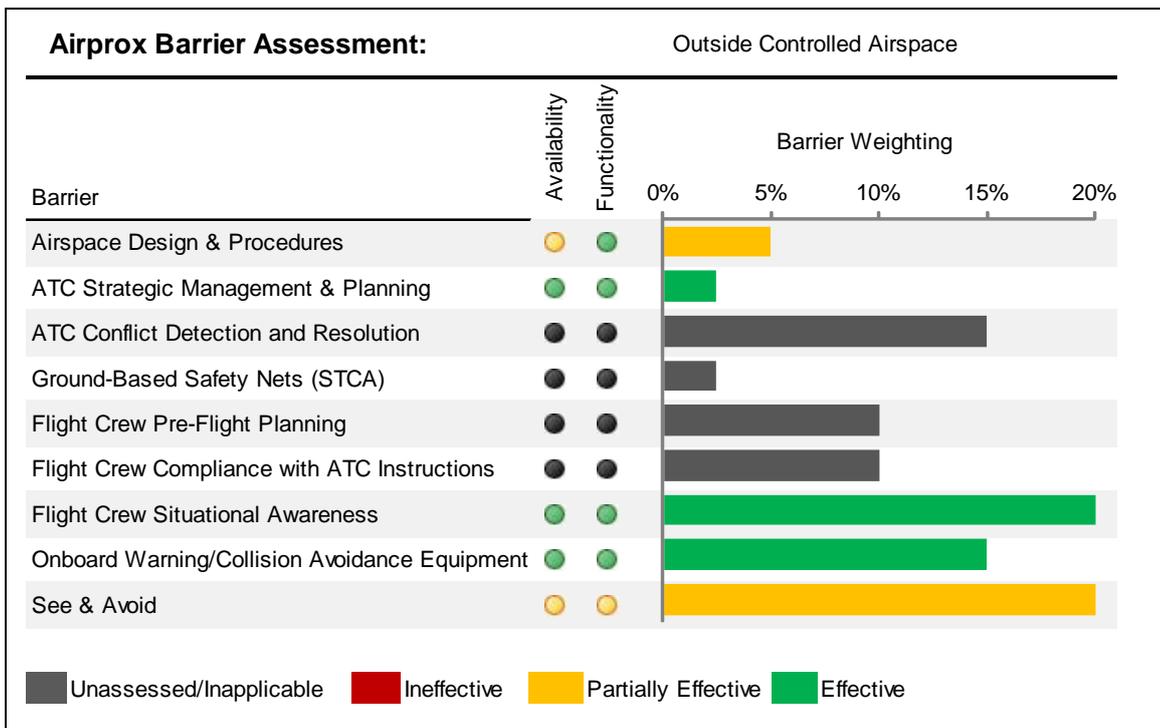
Cause: The EV97 pilot flew close enough to cause the EC135 pilot concern.

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).⁶ 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.

⁶ 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)	