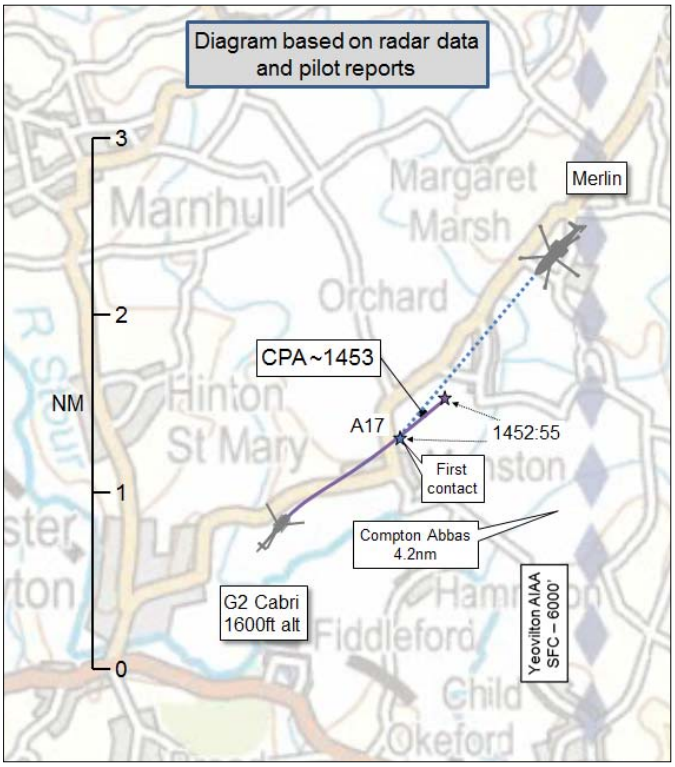
## AIRPROX REPORT No 2016273

Date: 29 Nov 2016 Time: 1453Z Position: 5057N 00216W Location: 4.2nm WSW Compton Abbas

## PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

| Recorded | Aircraft 1 | Aircraft 2 |
|---|---|---|
| Aircraft | Merlin | G2 Cabri |
| Operator | HQ JHC | Civ Trg |
| Airspace | London FIR | London FIR |
| Class | G | G |
| Rules | VFR | VFR |
| Service | Basic | Basic |
| Provider | Yeovilton | Boscombe |
| Altitude/FL | NR | 1000ft |
| Transponder | A, C, S | A, C, S |
| **Reported** | | |
| Colours | Green | Grey |
| Lighting | HISL, nav, landing | Strobe, nav |
| Conditions | VMC | VMC |
| Visibility | 25km | NK |
| Altitude/FL | 1500ft | 1000-1500ft |
| Altimeter | RPS (NK hPa) | agl |
| Heading | 220° | NK |
| Speed | 80kt | NK |
| ACAS/TAS | Unserviceable | Not fitted |
| **Separation** | | |
| Reported | 0ft V/100yd H | Not seen |
| Recorded | NK | |




**THE MERLIN PILOT** reports conducting an IRT. During the descent into low-level the radar service was downgraded from a Traffic Service to a Basic Service as the aircraft descended below radar cover. No mention had been made by ATC or any crew member of any traffic in the vicinity. After no more than 2 minutes at low-level a simulated unexpected entry into cloud was initiated by the non-handling pilot instructor. The handling pilot, in accordance with standard procedures, immediately began flying the aircraft with sole reference to the instruments and initiated an emergency climb, with maximum continuous power whilst reducing speed to 80kts. At approximately 1500ft the non-handling pilot made a vocal exclamation as he saw a blue and white civilian helicopter at a similar level in the 12 o'clock position at no more than 100 yards distance. The flight path of the other aircraft was right to left, having approached from the 1-2 o'clock (southwest), and passed directly ahead. The aircraft was not seen until it was diverging and would likely have been in the non-handling (LHS) pilot's blind spot, i.e. behind the overhead console. The pilot noted that it was likely their aircraft would also have been in a blind spot of the civilian aircraft as they were climbing at a steep angle from his low left. It was the belief of both Merlin pilots that the civilian aircraft pilot was at no time aware of their presence and was not seen to have taken, or subsequently take, any avoidance manoeuvres. The weather was extremely clear but with a very low and bright sun, towards which the Merlin was heading, a factor that had been mentioned by the handling pilot whist at low-level and which had forced a decision to 'keep the height up' at low-level for safety due to the reduced into-sun visibility. The civilian aircraft would have approached from the sun making it harder to see. After the event, ATC were questioned as to whether they had anything on radar and the crew were informed they were holding one contact that matched the position of the civilian aircraft, but had no height information. It was the belief of both Merlin pilots that had their aircraft been 100 yards further ahead a collision would likely have resulted. The Merlin pilot noted that they had made an error by not reporting the Airprox by radio.

He assessed the risk of collision as 'High'.

**THE G2 CABRI PILOT** reports conducting a navigation training flight, operating between 1000ft and 1500ft agl under a Basic Service from Boscombe Down. A Merlin helicopter was not seen by either pilot during the flight.

**THE YEOVILTON CONTROLLER** reports controlling five Grob Tutors under a Traffic Service and a number of other aircraft under Basic Service. The Merlin pilot called him from the east of Yeovilton, requested a Traffic Service and a transit to work in the 'IF areas'. The aircraft was positively identified, given a Traffic Service, and given own navigation to the IF areas. Soon after, the controller began conducting a handover to the oncoming controller, in addition to calling traffic to at least two of the Grob Tutors. At this point the Merlin was no longer visual on the radar screen so he contacted the pilot to confirm its position. He was told that they had descended to low-level, having not informed him prior to doing so. He advised the Merlin pilot that they were no longer visual on radar and downgraded their service to a Basic Service. Having completed the rest of the handover, he heard the Merlin pilot contact his relief, asking if there was an aircraft near their current position. At no point was an Airprox called, and the controller was not informed that this incident was considered an Airprox until much later

**THE YEOVILTON SUPERVISOR** reports having no recollection of the events described, most likely due to the time elapsed since the event and the fact that an Airprox was not declared on frequency.

**THE BOSCOMBE CONTROLLER** did not file a report with the UKAB.

## Factual Background

The weather at Boscombe was recorded as follows:

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METAR EGDM 291450Z 07006KT CAVOK 05/M03 Q1032 BLU NOSIG=
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## Analysis and Investigation

### UKAB Secretariat

The Merlin and G2 Cabri pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard. If the incident geometry is considered as head-on or nearly so then both pilots were required to turn to the right[1]. If the incident geometry is considered as converging then the Merlin pilot was required to give way to the G2 Cabri[2].

### Occurrence Investigation

An occurrence investigation concluded that the planning, briefing and execution of this sortie was conducted satisfactorily. Barring several minor oversights and factors not considered immediately before and after the incident, the planning considerations and CRM, particularly in regard to the U/S TAS, was suitable and satisfactory. The investigation produced several recommendations regarding the execution of future sorties. It is not recommended that TAS be considered a GO/NO GO item of equipment; TAS is an aid to the maintenance of situational awareness, alongside ATC services and effective lookout. The crew understood and mitigated the U/S TAS to the best of their ability.

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

## Comments

### G2 Cabri Operating Authority

The crew observed the weather minima set by the company for navigation training flights, which are in excess of VFR limits. On receiving a report of an Airprox event, all staff and students were re-briefed on the necessity of maintaining a good lookout during all phases of flight.

### HQ JHC

CHF carried out a thorough investigation into this Airprox and identified the barriers that were compromised. Had ATC been made more aware of the intentions of the aircraft they could potentially have provided earlier information on the conflicting traffic: this was particularly pertinent given that the into-sun visibility was very limited at the time due to the sun's height and intensity. The unavailability of TAS was also considered but it was decided that lack of a serviceable TAS would not become a 'no-go' item so long as the crew were aware and tempered its loss/unavailability by modifying their profile should it be deemed necessary. However, considering the lessons identified the following steps have been taken to mitigate further against similar incidents recurring.

1. Instructors have been reminded that when conducting IRTs they are to inform ATC of their intention to conduct instrument PFLs followed by Low-Level IF Abort and to request an update on any other air traffic in the vicinity.
2. Instructors have been reminded to ensure clearing turns (away from sun) are conducted prior to completing simulated Low Level IF Aborts, during which lookout will, by necessity, be degraded.
3. All squadron aircrew have been re-briefed on the importance of reporting a perceived Airprox in a timely manner.

The lessons identified as a result of this report will be shared amongst all JHC communities.

### NAVY HQ

Though a thorough investigation was carried out by JHC, a similarly robust process within ATC was hindered by a delay of 7 weeks between the Airprox and its notification to Yeovilton ATC and UKAB. This highlights the importance of prompt reporting to ensure all relevant information is captured. That said, from an ATC point of view, this is quite a straight forward event. The Approach controller met the requirements of a TS and, when surveillance contact was lost due to the Merlin's descent, downgraded that to a BS. The controller was busy giving TI to other aircraft on frequency who were under a TS so rightly prioritised between all aircraft on frequency based on the type of service he was providing. Had the Merlin advised the controller of his intentions to descend (iaw his obligations under a TS) this may have prompted the controller to give a final update of traffic info before surveillance contact was lost.

## Summary

An Airprox was reported when a Merlin and a G2 Cabri flew into proximity at about 1453 on Tuesday 29th November 2016. Both pilots were operating under VFR in VMC and both were in receipt of a Basic Service from Yeovilton.

## PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from both pilots, radar photographs/video recordings, a report from the air traffic controller involved and reports from the appropriate operating authorities.

The Board was satisfied that the comprehensive service investigation had captured the relevant 'lessons identified'. Of particular note, members commented that the date and location of the

occurrence was such that the sun was very low on the horizon and on a bearing which placed the Cabri directly into sun from the Merlin crew's perspective. Members commented on the importance of clearing an aircraft's flight-path before a manoeuvre, including not manoeuvering into sun, in order to maximise the likelihood of visually acquiring potentially conflicting traffic. Subject to airspace restrictions, the non-handling pilot may have been better placed if he had ensured that the aircraft was not pointing into sun when he initiated the climb. Some members also commented that in the event of a barrier being absent, in this case the Merlin TCAS, it was good practice to restore a degree of mitigation by strengthening other barriers, such as Traffic Information from a surveillance based ATC service, when one might not otherwise be requested. The Merlin crew had done this initially by requesting a Traffic Service, but had negated that service when they descended to low-level. A better option may have been to notify ATC of an operating area and height block within which ATC could then still have provided generic Traffic Information, or the Merlin crew could have requested an update to traffic in their vicinity before descending to low-level. The Board agreed with JHC regarding their comment that unserviceability of TAS should not be considered a blanket no-go item, but added the proviso that this was mission-dependent; there may well be other sortie types or tasks where TAS should reasonably be considered a required item.

In the event, the Board agreed that the Airprox had been caused by a late sighting of the Cabri by the Merlin crew and a non-sighting of the Merlin by the Cabri pilots. Members also agreed that the geometry of the confliction was such that the Merlin pilot had only seen the Cabri as it entered his field of view, that he would have had little time to change the situation, and so providence had played a major part in determining the aircrafts' separation at CPA.

## PART C: ASSESSMENT OF CAUSE, RISK AND SAFETY BARRIERS

Cause: A late sighting by the Merlin crew and a non-sighting by the Cabri pilot.

Degree of Risk: A.

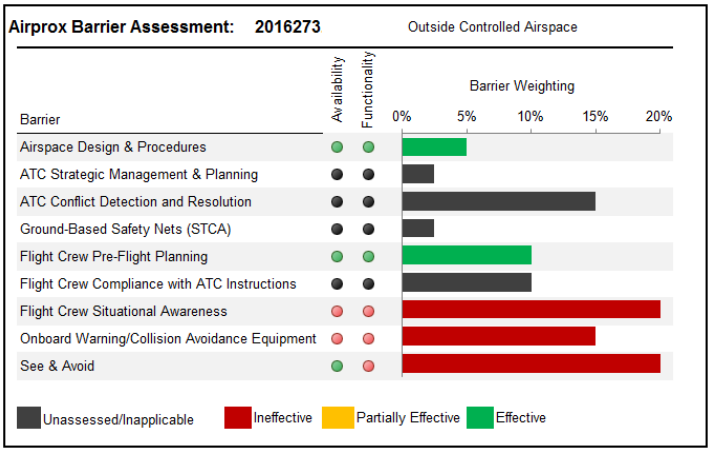
Safety Barrier Assessment[3]

The Board decided that the following key safety barriers were contributory in this Airprox:

**Flight Crew Situational Awareness** was assessed as **ineffective** because there were no systems present to provide SA and neither of the flight crews involved were aware of the presence of the other aircraft.

**Onboard Warning/Collision Avoidance System** was assessed as **ineffective** because the Merlin's TCAS was unserviceable and the Cabri was not fitted with a TAS.

**See and Avoid** was assessed as **ineffective** because the Merlin crew did not see the Cabri in time to increase separation, and the Cabri pilots did not see the Merlin at all.




[3] 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 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). 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 Unassessable/Inapplicable). The chart thus illustrates which barriers were effective and how important they were in contributing to collision avoidance in this incident. The UK Airprox Board scheme for assessing the Availability, Functionality and Effectiveness of safety barriers can be found on the UKAB Website.