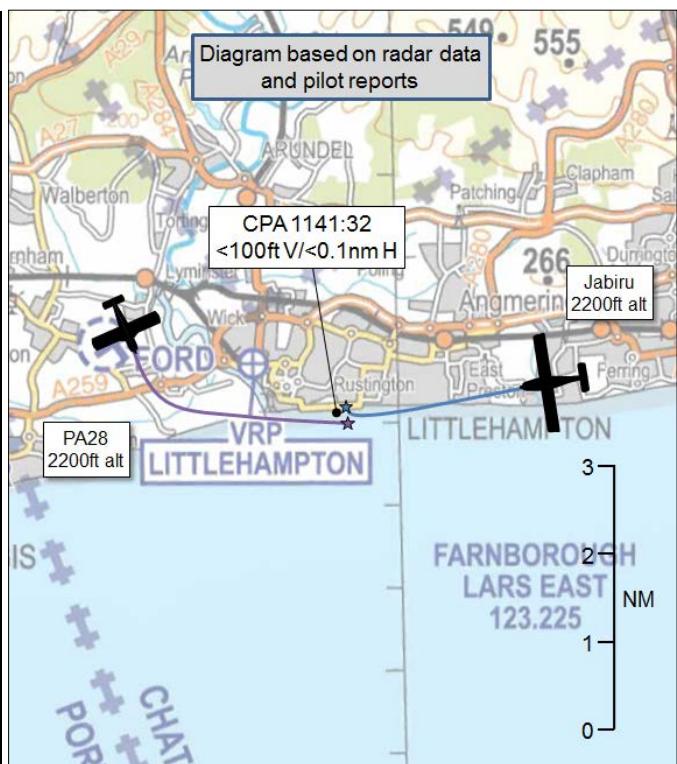


AIRPROX REPORT No 2016191

Date: 06 Aug 2016 Time: 1141Z Position: 5048N 00031W Location: 1nm S Littlehampton

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

| Recorded | Aircraft 1 | Aircraft 2 |
|-------------|---------------|---------------|
| Aircraft | Jabiru | PA28 |
| Operator | Civ Pte | Civ Trg |
| Airspace | London FIR | London FIR |
| Class | G | G |
| Rules | VFR | VFR |
| Service | None | Basic |
| Provider | | Shoreham |
| Altitude/FL | 2200ft | 2200ft |
| Transponder | A, C | A, C |
| Reported | | |
| Colours | White, Orange | Blue, White |
| Lighting | Nil | Tail strobe |
| Conditions | VMC | VMC |
| Visibility | 20km | >20km |
| Altitude/FL | 2200ft | 2500ft |
| Altimeter | QNH (1027hPa) | QNH |
| Heading | 260° | 090° |
| Speed | 95kt | 90kt |
| ACAS/TAS | Not fitted | Not fitted |
| Separation | | |
| Reported | 10ft V/20m H | 0ft V/500m H |
| Recorded | | 0ft V/0.1nm H |



THE JABIRU PILOT reports that he was in receipt of a Basic Service from Farnborough LARS East, the weather was CAVOK and there was no cloud in the vicinity. The controller had previously given helpful Traffic Information. He had routed north of Shoreham ATZ then turned towards the south coast, when he saw a low-wing GA aircraft almost directly ahead at a range of 200m; it was approximately 10ft above, just a few feet to his left and flying straight-and-level. He ‘threw’ his aircraft into a sharp right-turn to avoid an almost certain collision. He estimated he only had about 2 seconds to take the action, and it appeared the other aircraft did not take any action at all; it then passed down his left-hand-side. He noted that he was fully aware of the definition of a LARS Basic Service and in future would request a Traffic Service.

He assessed the risk of collision as ‘High’.

THE PA28 PILOT reports that he was routing inbound to Shoreham and had switched frequency from Farnborough to Shoreham. The traffic at Shoreham was busy and he was instructed to orbit in the Worthing area to start with. He proceeded along the coast heading 090° approximately 0.5nm out to sea. The oncoming aircraft was spotted about 0.5nm away at a similar altitude, and he commenced a turn to the right. The other aircraft turned steeply to the right and so he judged further avoiding action unnecessary. He judged that the horizontal separation was not less than 500m at any stage.

He assessed the risk of collision as ‘Low’.

Factual Background

The weather at Shoreham was recorded as follows:

EGKA 061120Z 22012KT 9999 FEW028 20/15 Q1028=

Analysis and Investigation

CAA ATSI

The Jabiru had been receiving a Basic Service from Farnborough. At 1138:40, (Figure 1), having been advised by the Farnborough LARS controller that he was approaching the edge of their radar cover, the pilot elected to change to Solent Radar and to select the appropriate frequency monitoring transponder code (listening squawk). The code was observed to change at 1139:20.

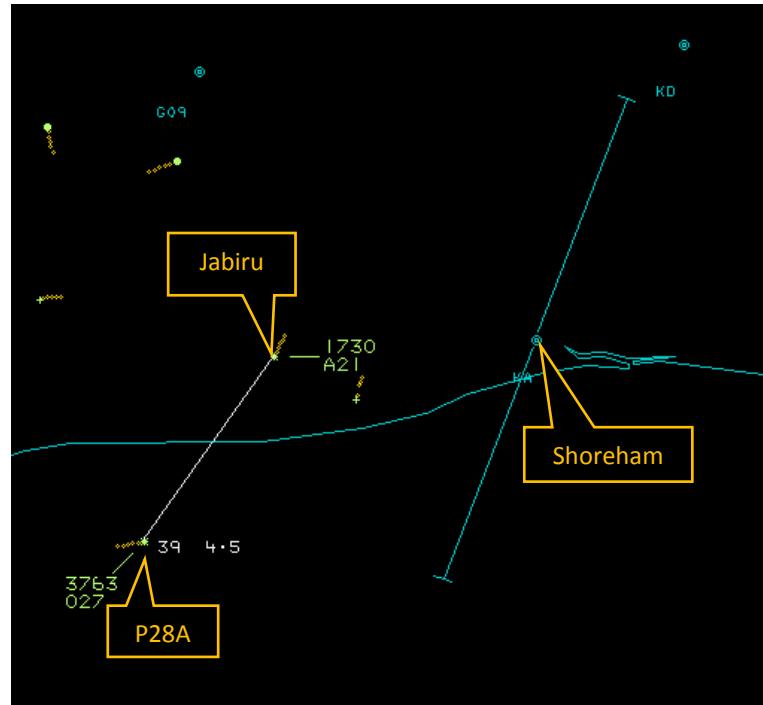


Figure 1 – 1138:40

The PA28 was receiving a Basic Service from Shoreham Approach. Although the Jabiru had been observed on radar to pass within 3.6nm to the north-west of Shoreham's airfield, the Shoreham Approach controller did not have access to surveillance equipment, was not speaking to and so was not aware of the presence of the Jabiru.

CPA was assessed to have taken place at 1141:30, with the aircraft separated by 0.1nm laterally and <100ft vertically.

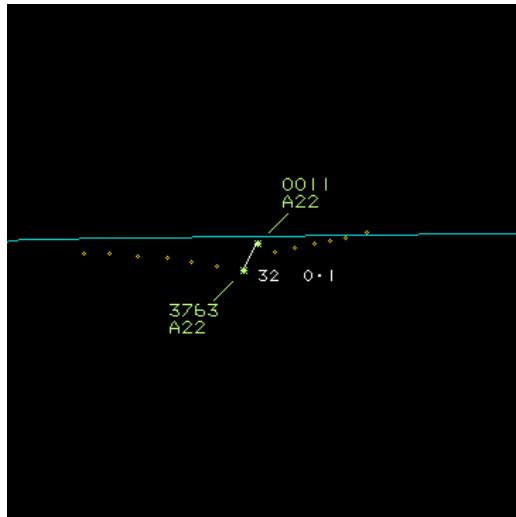


Figure 2 – CPA at 1141:30

The Jabiru was not receiving any ATC service at the time the Airprox occurred. The PA28 was receiving a Basic Service from Shoreham, but the controller did not have access to radar. In accordance with CAP774, a Basic Service relies on the pilot avoiding other traffic, unaided by controllers/ FISOs.

UKAB Secretariat

The Jabiru 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 a Jabiru and a PA28 flew into proximity at 1141 on Saturday 6th August 2016. Both pilots were operating under VFR in VMC, the Jabiru pilot was not in receipt of an ATS and the PA28 pilot in receipt of a Basic Service from Shoreham.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board first looked at the actions of the Jabiru pilot. Noting that the position of the Airprox was on the very extremes of Farnborough radar coverage, and that he had already left the Farnborough frequency, the Board wondered whether he could have called Shoreham as he transited past rather than switch to Solent. Although Shoreham wouldn't have been able to give him a Traffic Service (Shoreham doesn't have radar), work-load permitting they may have been able to give generic Traffic Information on inbound aircraft. At the very least he would have been on the same frequency as the PA28, and may have heard a radio call that would have alerted him to the fact that it was transiting in the opposite direction.

For his part, the PA28 pilot was inbound to Shoreham and acting in accordance with his clearance in routing via Worthing. The Board noted his differing perception in the assessment of risk, and thought this was probably due to the Jabiru pilot being startled by the PA28, whilst the PA28 pilot had seen the other aircraft half a mile away and felt that the separation was adequate. Nevertheless, the radar separation indicated that the two aircraft were at the same level and only 0.1nm (180m) apart rather than his estimate of 500m. As such, the Board wondered whether the PA28 pilot would have been better advised to have given the other aircraft a wider berth given that he could not know if the other pilot had seen him or not. The geometry being head-to-head, neither pilot had right-of-way and, without knowing the intentions of the other pilot or whether he was visual with him, they opined that pilots should always endeavour to ensure that there is a safe margin for error when passing another aircraft; a turn of a few more degrees taken earlier by the PA28 pilot would have more effectively broken the closing geometry.

The Board noted that both pilots were entitled to route where they had, but highlighted that there had recently been a number of Airprox taking place over coastlines. For many reasons, coastlines are a popular place to fly and, as such, pilots should pay extra attention to their look-out. Similarly, noting that Littlehampton is a VRP, pilots are reminded that the CAA recommends that pilots don't fly directly overhead VRPs because of the risk of meeting another aircraft in the same location, and should pay particular attention to their lookout in the vicinity. In discussing ways in which pilots can mitigate the risk of mid-air-collision, GA members discussed the value of contemporary TAS systems, and noted that they were becoming increasingly affordable as low-cost cueing systems.

¹ SERA.3205 Proximity.

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

In assessing the effectiveness of the barriers associated with this incident, the Board concluded that the key factors had been that:

- **Situational Awareness** had been **ineffective** – neither pilot was aware of the other's close proximity.
- **Onboard Warning/Collision Warning Equipment** was also assessed as **absent** because neither aircraft was fitted with such equipment.
- **See-and-Avoid** was assessed as **partially effective** because the relatively late sighting by both pilots meant that, even with avoiding action, the encounter was closer than desirable.

Finally, in turning to the cause of the Airprox, the Board quickly agreed that, although the PA28 pilot reported that he had seen the Jabiru at 0.5nm distance, this was only 10 secs or so before they crossed at their combined closure rate. Some members commented that this was well within normal standards, but others wondered why, if this was the case, the PA28 pilot had not steered away more. Noting that his estimate of 500m separation was grossly in excess of the actual 180m, GA members opined that he may also have over-estimated the initial sighting distance. After considerable debate, the Board agreed that it was likely that the PA28 pilot had made a later sighting than he thought, and evident that a late sighting was the case for the Jabiru pilot. As a result, the Board agreed that the incident was probably best described as a later than desirable sighting by both pilots. Turning to the risk, members noted the close separation head-on, and that the Jabiru pilot had felt he had to conduct an emergency manoeuvre to avoid 'an almost certain collision' with the PA28. As a result, they assessed the risk as Category B, safety had been much reduced below the norm.

PART C: ASSESSMENT OF CAUSE AND RISK

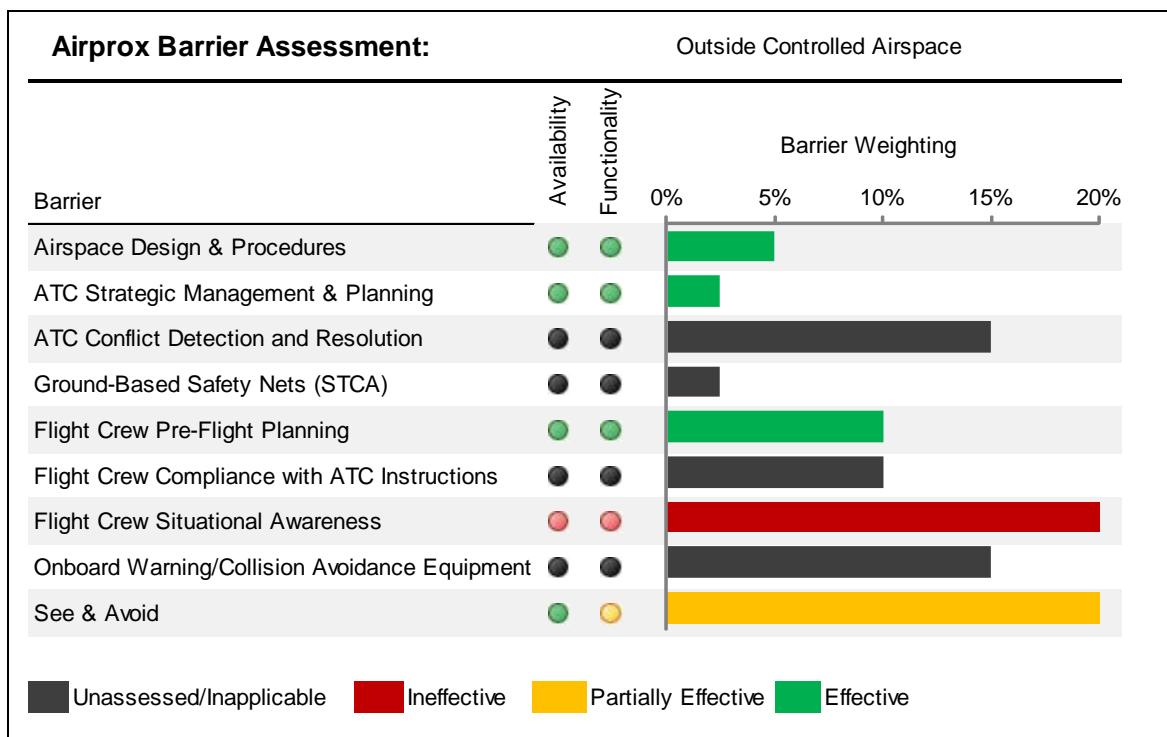
Cause: A late sighting by both pilots.

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).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.

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 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 | | | 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 (e.g. other aircraft not transponding) | 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 pilot's visibility was uninhibited, one pilot's 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) | |