ACCIDENT

Aircraft Type and Registration:	1) Robinson R44 II, G-SAIG 2) Spitfire IXT, G-CCCA
No & Type of Engines:	1) 1 Lycoming IO-540-AE1A5 piston engine 2) 1 Rolls-Royce Merlin 66 piston engine
Year of Manufacture:	1) 2006 (Serial no: 11364) 2) 1944 (Serial no: CBAF 9590)
Date & Time (UTC):	15 June 2016 at 1151 hrs
Location:	Lashenden (Headcorn) Aerodrome, Kent
Type of Flight:	1) Private 2) Safety Standards Acknowledgement and Consent
Persons on Board:	1) Crew - 1 Passengers - 1 2) Crew - 1 Passengers - 1
Injuries:	1) Crew - None Passengers - None 2) Crew - None Passengers - None
Nature of Damage:	1) Tail rotor guard, empennage and stabilizer 2) Propeller blade
Commander's Licence:	1) Private Pilot's Licence 2) Airline Transport Pilot's Licence
Commander's Age:	1) 56 years 2) 56 years
Commander's Flying Experience:	1) 208 hours (of which 131 were on type) Last 90 days - 2 hour Last 28 days - 2 hour 2) 20,000 hours (of which 101 were on type) Last 90 days - 34 hours Last 28 days - 16 hours
Information Source:	Aircraft Accident Report Form submitted by the R44 pilot, report from Spitfire pilot and further AAIB enquiries

Synopsis

The Robinson R44 helicopter hover taxied across Runway 28 as the Spitfire was completing its landing roll. The propeller of the Spitfire contacted the empennage of the helicopter but neither pilot was aware there had been contact, although a bump was felt in the R44. The helicopter returned to the apron for an inspection, where damage to its empennage and tail rotor guard was discovered.

History of the flight

The Spitfire

The Spitfire was carrying out a series of pleasure flights under the Safety Standards Acknowledgement and Consent regulations (explained later in this report). The weather conditions were reported as clear, with a Met Office weather observation at 1155 hrs at Frittenden, 4 km south west of Headcorn, recording the surface wind as being from the south-south-west at 7 kt, with gusts to 12 kt.

The pilot joined the circuit, reported "downwind" and then made a continuous left turn on to the final approach for Runway 28, a grass runway (Figure 1). He reported "final to land" during the turn, which was acknowledged by the Air/Ground (A/G) radio operator, and, in the turn, observed a helicopter hovering to the south of the runway, near the parking area. He maintained visual contact with the helicopter, until rolling wings level at about 100 ft agl on the final approach path. With the surface wind from the south-west, the nose of the aircraft was offset to the left as the pilot lined up with the runway, thereby obscuring his view of the parking apron.

After touching down and rolling along the runway centreline for approximately 200 m, the Spitfire pilot saw a helicopter pass, left to right, directly above his aircraft. He was not aware of any contact but on inspection after shutdown, minor damage to one propeller blade was discovered.

The Robinson helicopter

The helicopter pilot and his passenger, who was also a qualified pilot, had planned a private flight to the Isle of Wight. From the apron area to the south of Runway 28, the helicopter lifted into the hover, after the pilot had received approval on the A/G radio frequency, and hover taxied north towards the helicopter holding point on the north side of the airfield, near the Runway 03 threshold, which is used prior to departure from Runway 28. The pilot looked for other traffic and transmitted "crossing active" as he continued towards the threshold of Runway 03. Meanwhile, as the helicopter lifted in to the hover, the passenger had turned his attention to his iPad, on which he was plotting the route.

As they crossed the runway, the pilot and passenger both heard a noise and the passenger felt a slight bump. They saw the Spitfire to their left and after a short time decided to return to the apron. On inspection, damage to the empennage and tail rotor guard was discovered.

Witnesses

A tractor, moving from west to east, was mowing the grass to the south of Runway 28. The driver was wearing headphones and listening out for aircraft movements on the airband radio. He heard normal 'downwind', and 'finals' radio calls from the Spitfire, and heard the helicopter pilot advising they had two persons on board and were departing to the Isle of Wight. He saw the helicopter hover taxiing away from the apron, north towards the runway, at an estimated speed of 10 kt, and heard the pilot call "crossing active" but at a lower volume than on the previous transmissions. He realised that the helicopter was not going

to stop and watched it cross the runway as the Spitfire was completing its landing roll. He thought an accident was about to occur but he did not see evidence of any contact between the two aircraft.

A second witness, the pilot of a light aircraft, had just landed on Runway 28 and was taxiing back to the parking area. He could see the Spitfire on final approach and stopped to watch it land. While he was watching, he noticed a helicopter hover taxiing north towards the runway. He assumed it would hold on the south side and turned his attention back to the Spitfire. He watched the landing and the ground roll and was surprised, then, to see the Spitfire pass to the rear of the helicopter, meaning that the helicopter was above or across the runway.

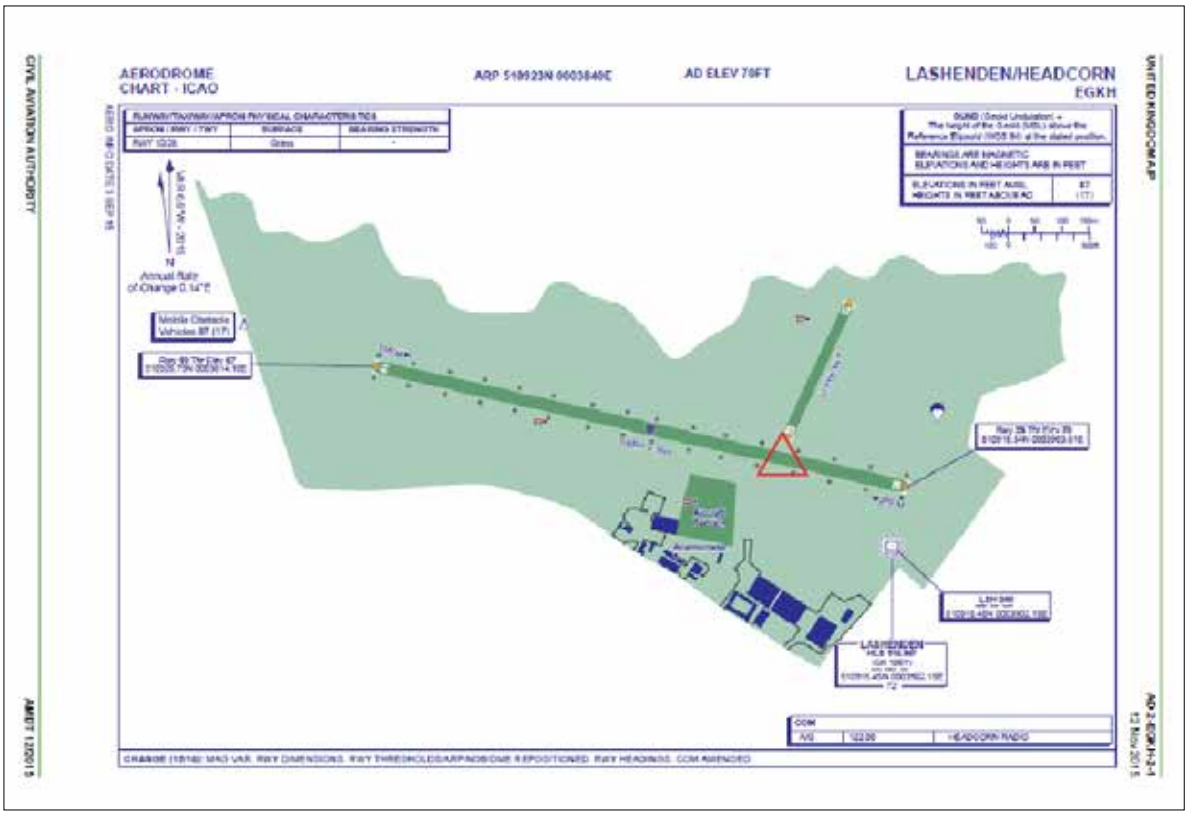

Figure 1

Lashenden/Headcorn Aerodrome
(red triangle indicates the location where contact between the two aircraft occurred)

Helicopter pilot

The helicopter pilot reported that he had stopped to look for traffic and made a radio call before crossing to the north side. He did not hear any other traffic on the frequency. As he crossed Runway 28, he heard a “whooshing” noise but did not feel any contact. He concluded that he had not seen the other aircraft because he was looking for aircraft on approach and not on the ground.

Airfield information

Lashenden/Headcorn Aerodrome operates an A/G Communication Service; non-radio aircraft being accepted with prior permission. A/G radio operators are not able to issue instructions to aircraft but rotorcraft are required to obtain a clearance prior to rotor engagement.

Organisational and guidance information

The CAA publications CAP 1395, '*Safety Standards Acknowledgement and Consent (SSAC)'* and CAP 1396, '*Framework for the evaluation of aviation activities for payment based on Safety Standards and Consent'* set out the requirements for the operation of flights where members of the public can pay to fly as a passenger in an aircraft not operated under an Air Operator's Certificate (AOC). This allows paid recreational flying, with the underlying principle of a consent-based activity. The following guidelines apply:

- *'The participants are informed of the risks involved with participating in the activity*
- *The participants are able and willing to consent to assume the risks involved with participating in the activity, and give such consent*
- *The level of risk to the public at large is not increased beyond a margin which is acceptable to the CAA and the public at large'*

The CAA publication Safety Sense Leaflet 13, *'Collision Avoidance',* provides advice for pilots on how to conduct an effective lookout. It also contains the following guidance:

> *'Encourage your passengers to assist in the look-out.'*

The CAA publication CAP 413, '*Radiotelephony Manual',* advises:

> *'Air/Ground Communication Service operators are not to pass instructions and must use the phraseology they would use for the movement of aircraft on the aerodrome.'*

When Spitfire operations were in progress at Headcorn, an additional sign board was placed at the light aircraft holding area for Runway 28, to caution pilots. A similar sign was not available for helicopter operations, because a sign board where the runway is crossed would create an obstruction.

Analysis

The Spitfire pilot flew a curved approach to maintain a view of the runway. However, once he was lined up with the runway, his view ahead and to the left was obscured by the nose of the aircraft. This approach pattern may have been unfamiliar to the helicopter pilot and, as a result, when he looked out before crossing the runway he did not see the Spitfire. The helicopter was hover taxiing in gusty tailwind conditions and, although the pilot reported that he had stopped to look, evidence from the other witnesses suggested that the helicopter continued moving forwards.

Safety action has since been taken by the aerodrome operator, to require helicopter pilots to stop and make an additional radio call before crossing the active runway.

The helicopter passenger, who would also have had an opportunity to see the Spitfire, was directing his attention elsewhere.

The Spitfire was operated under the terms of SSAC, whereby a passenger who has paid for the flight is made aware of the increased level of risk, relative to that for an AOC flight. However, it was concluded that this accident could equally have occurred during an AOC operation.

Conclusion

The helicopter pilot did not see the Spitfire on approach, probably because he looked in the wrong direction. The passenger did not participate in the lookout.

Safety action

After the accident, the Aerodrome Safety Manager issued a safety notice to the helicopter operator based at the airfield, requiring helicopters to hold short of the active runway and request clearance to cross. The A/G radio operator will then inform the helicopter pilot of any known traffic and the pilot, having checked it is safe to do so, may then cross the runway.