

No: 11/89

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Category: 1c

Aircraft Type and Registration: Steen Skybolt, G-BFHM

No & Type of Engines: 1 Continental IO-346A piston engine

Year of Manufacture: 1978

Date and Time (UTC): 7 August 1989 at about 2005 hrs

Location: Scofton, near Worksop, Nottinghamshire

Type of Flight: Private

Persons on Board: Crew -1 Passengers -1

Injuries: Crew -1 (fatal) Passengers - 1 (serious)

Nature of Damage: Aircraft destroyed

Commander's Licence: Private Pilot's Licence

Commander's Age: 44 years

Commander's Total Flying Experience: 275 hours (of which about 80 hours were on type)

Information Source: AAIB Field Investigation

The Steen Skybolt G-BFHM was jointly owned by a group of three pilots and based at Netherthorpe airfield, South Yorkshire. In the early evening of 7 August 1989 one pilot of the group arrived at the airfield and agreed to take another pilot, who is a member of the resident Aero Club, for a flight which was to include general aerobatics and demonstrations of spin recovery. The second pilot had a valid Private Pilot's Licence and had flown in the Skybolt on previous occasions. She had previous experience of aerobatic flight but had never flown the aircraft solo.

In preparation for the flight both pilots wore flying suits with closed zipped pockets, and both were equipped with fabric flying helmets with goggles attached. Neither pilot wore spectacles or sunglasses. The first pilot had also emptied his pockets of all potential loose articles and left his belongings in his car. When flown solo the Steen Skybolt is normally flown from the rear cockpit. On this occasion the first pilot occupied the front cockpit and the second pilot occupied the rear cockpit.

The aircraft took off from Netherthorpe at about 1930 hrs and climbed out towards the disused airfield at Scofton. This used to be a Royal Air Force flying training base but has now been returned to agriculture. However the main runway has been retained and is used when required by a brake manufacturing company to test their products. The runway is a distinct ground feature and pilots

practicing aerobatics frequently use it as a 'display line' and are also attracted by the 6000 feet runway length should they require it in an emergency.

The second pilot reports that the aircraft was climbed to overhead Scofton where several spins and recoveries were carried out, generally at a height of about 4000 feet above ground level. She then recalls doing a roll and a loop before pulling up into a stall turn. During the recovery from this last manoeuvre the aircraft rotated, as if it were entering a spin, before rolling in the opposite direction. Suspecting that something was wrong she handed over control to the first pilot. The first pilot next shouted that she should 'get off the controls' and repeated this at least twice. She recalls that she could not understand this as she had released her hold of the controls when first requested to do so. The aircraft descended steeply before it seemed to level out just prior to a firm contact with the ground. The second pilot was aware of flames around her most of which were to the front and, as the aircraft came to rest, there was an explosion. She managed to release her harness, and escaped from the cockpit with her flying suit alight. She ran a short distance from the aircraft and smothered the flames by rolling on the ground. The first pilot had been knocked unconscious during the initial impact and remained in the aircraft.

Witnesses close to the scene report hearing the sound of a light aircraft that seemed to be performing aerobatics, but did not especially look up as this was a regular occurrence in that area. However one eye-witness does report that he saw the aircraft travelling fast in a steep descent before it disappeared from view behind some trees. He then heard the sound of an impact, followed immediately by an explosion and saw thick black smoke rising from behind the trees. After ensuring that the emergency services were alerted he drove to the accident site where other witnesses who had heard the explosion were also gathering. By this time the entire aircraft was engulfed in a fierce fire and it was only possible to assist and comfort the second pilot, whilst awaiting the arrival of an ambulance. The second pilot is reported to have stated at this time that the aircraft's rudder had jammed.

The aircraft had crashed on flat ground approximately half a mile from the runway at Scofton. Examination of the aircraft wreckage and impact marks showed that the aircraft had struck the ground in a wings level and slightly nose down attitude on a track of 090°. It travelled a further 72 feet before coming to rest on a heading of 120°. There was evidence that the track over the ground had been straight and therefore the aircraft must have first contacted the ground with a considerable amount of yaw to the right. The propeller, which had been under low power, struck the ground and immediately separated from the engine. This caused the engine to partially separate from its mountings in a downward direction, which fractured the fuel lines and released fuel which immediately ignited. Residual fuel from the secondary fuel tank, which was in the centre section of the top wing also ignited.

The aircraft was burned out in the post-impact fire and it was apparent from traces of melted aluminium in the wreckage that the heat had been intense, however the main metal structure was largely intact. It was thus possible to establish that, prior to impact, the aircraft had been complete and that all control surfaces were attached and properly connected. No pre-existing defects in the controls were found, and they all operated freely and in the correct sense. There was some damage to the fin and rudder caused by lateral loads during the impact sequence.

The rudder controls of the Skybolt are cable operated. The rear pilot's pedals are connected by cables to the rudder and to the front pilot's pedals, which are in turn connected by springs to the main structure. The rear pilot's rudder pedals are situated either side of the front pilot's seat, and in this aircraft were directly below the arm-rests. The rudder controls are such that it is unlikely that a loose object could cause a jam, except in the vicinity of the rudder pedals. The cockpits are not fitted with close fitting bulkheads and so it is possible for any loose objects to move freely during flight.

During the on site examination the remains of a pair of spectacles or sunglasses together with an "AA" size battery such as used in many torches etc, were found amongst the wreckage. Their position was such that they must have been on board the aircraft in flight. None of the equipment fitted to the aircraft required an "AA" battery and it was not possible to establish when or how these items came to be on board.

A post mortem examination of the first pilot failed to reveal any pre-existing condition that could have caused or contributed to the accident. Expert medical opinion considers that it is possible that the pilot might have survived if he had been wearing a protective helmet.