

No: 6/91

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Category: 1c

Aircraft Type and Registration: Piper PA-38-112, Tomahawk, G-BRMK

No & Type of Engines: 1 Lycoming O-235-L2C piston engine

Year of Manufacture: 1979

Date & Time (UTC): 31 March 1991 at 1645 hrs

Location: Coventry (Baginton) Airport

Type of Flight: Private

Persons on Board: Crew - 1 Passengers - 1

Injuries: Crew - Fatal Passengers - Fatal

Nature of Damage: Aircraft destroyed

Commander's Licence: Commercial Pilot's Licence with
Assistant Instructor rating

Commander's Age: 26 years

Commander's Flying Experience: 616 hours (of which 314 were on type)

Information Source: AAIB Field Investigation

A flight of 3 aircraft in loose 'V' formation was planned. The lead aircraft was to be flown by a private pilot and the left and right aircraft each by a Flying Instructor. Following an informal discussion on the basic outline of the flight, a formal briefing was given, jointly, by the two Flying Instructors. At 1630 hrs the formation was to take-off, on runway 23, climb straight ahead to 300 to 400 feet and turn left onto the downwind leg at 600 feet, using the road which paralleled the runway as a guide. All turns were to be limited to rate 1. The formation was to start the base leg turn at a suitable point to allow a 2 nm final approach. It was planned to arrive level at 30 to 50 feet agl halfway down the runway, at a speed of 100 kt. Abeam the control tower, the lead aircraft was to call 'Break' and climb on runway heading to 500 feet; the left aircraft would pull into a climbing turn left onto a heading of 140°(M), again to 500 feet, and would slow to 70 kt. The right aircraft was to pull into a climbing turn right onto a heading of 320°(M) until it had sufficient height to continue the turn onto 140°(M). It was then to fly over the control tower and runway 05 threshold to rejoin the formation at 500 feet downwind for a full stop landing. The lead aircraft was to touch down about halfway along the runway and the other two to land side by side a suitable distance behind.

At 1600 hrs the three pilots recapped the plan again and, at about 1615 hrs, went out to their aircraft. The lead aircraft was flown from the left-hand seat and the other two from the right-hand seat. Each aircraft carried a passenger. G-BRMK was on the right of the formation. Taxi clearance was at 1622 hrs and the formation taxied to hold on the grass side of Alpha. Circuit traffic delayed the take-off and clearance was eventually given at 1637 hrs. The surface wind was 240°/7 kt. The take-off and downwind leg were uneventful and the formation flew down the runway at about 40 feet agl. At 1645 hrs, just before the 05 threshold, the leader called 'Formation Break'. The pilot of left aircraft noted that the airspeed was 'a good 100 kt' when this call was made. The lead and left aircraft broke as planned. G-BRMK was seen to enter a steeply banked right turn, in a high nose-up attitude. The turn was continuous and, as the aircraft headed back towards the airfield, it started to descend. The bank angle increased and, at one point, appeared to exceed 90°. It passed close to the west side of the control tower in a steep, descending right spiral, still under power. The bank angle was reduced shortly before the aircraft struck the ground, heading southwest, in a steep nosedown attitude. Some seconds after impact, a fire started which was quickly extinguished by the Airport Fire Service. Both occupants were killed by the impact and post mortem examination revealed no pre-existing medical condition which could have contributed to the accident.

The aircraft had crashed on level sandy ground, which, when examined, was soft, wet and well trampled. Impact marks made by the engine, the right wing, and the left wingtip indicated that aircraft had hit the ground at an attitude of 45° nose down and with approximately 20° right wing low. The wings had sustained severe compressive buckling on their underside which had ruptured both fuel tanks and caused a release of fuel which had subsequently ignited. The rear fuselage had jackknifed and the rudder balance weight had detached and was found in cockpit.

The right aileron balance weight was found 40 metres behind the crash site and this led to an examination of the mode of failure of both the left and right aileron balance weights (which had been modified to include the aileron balance weight rib reinforcement kit). Both balance weights had failed from overload sustained during the crash and their failures were symmetrical.

No evidence of pre-impact defect was found in the flying controls, nor were any relevant defects recorded in the aircraft technical log. Ear witness reported a constant engine note; this was corroborated by damage to the propeller which had sustained some tangential scratches and forward bending on hitting the ground.