

No: 6/88

Ref: EW/C1064

Category: 1c

Aircraft Type and Registration: Piper PA28-140 Cherokee, G-ATUC

No & Type of Engines: 1 Avco Lycoming O-320-E2A piston engine

Year of Manufacture: 1966

Date and Time (UTC): 2 April 1988 at about 0840 hrs

Location: Ratlinghope, near Church Stretton, Shropshire

Type of Flight: Training

Persons on Board: Crew - 2 Passengers - None

Injuries: Crew - 2 (Serious) Passengers - N/A

Nature of Damage: Aircraft destroyed

Commander's Licence: Private Pilot's Licence with Assistant Flying Instructor and IMC ratings

Commander's Age: 45 years

Commander's Total Flying Experience: 560 hours (of which about 200 were on type)

Information Source: AAIB Field Investigation

An aftercast, prepared at the Meteorological Office in Bracknell, showed that, at 0845 hrs on Saturday 2 April, an almost stationary, but active, frontal zone lay from south-west Wales to the west of Cheshire. Ratlinghope was about 15 nm to the south-east of the surface position of the front, in the warm sector. The main cloud base was at 2000 feet, with embedded cumulus, base 1500 feet, chiefly over the hills. It was estimated that the 0°Celsius isotherm would have been at between 3000 and 3200 feet. Airframe icing could have been severe in thick stratocumulus, aggravated by the presence of the embedded cumulus. The Airmet information available for the period 0500 to 1300 hrs forecast this situation and predicted moderate airframe icing.

The pilot, an assistant flying instructor, intended to carry out a training detail, in the local area, with a student who had completed about 18 hours flying. This intention was recorded in the Technical and Journey Log. The weather at Halfpenny Green was suitable for the planned flight.

Following a discussion at the aircraft prior to departure, it was decided to operate, not in the local area, but between the airfield and Aberystwyth. Take-off was at 0804 hrs, and at 0815 hrs the pilot informed Birmingham Approach Control of his intentions. He reported that he was tracking 260° from Halfpenny Green at an altitude of 3000 feet.

At 0832 hrs G-ATUC told the Birmingham Approach controller that he had encountered severe icing at 3000 feet, and asked for a magnetic track to steer to return to Halfpenny Green. A track of 105° to Birmingham was given, and was acknowledged by the pilot. The aircraft did not carry a transponder and ATC had no contact on primary radar. This was the last recorded exchange with the aircraft.

The pilot recalled that, shortly after entering cloud while flying at 3000 feet on the area QNH, he experienced a sudden build-up of ice on the wings and windscreen. This was followed by a partial loss of engine power with associated rough running, despite the fact that carburettor heat was selected. Having advised ATC of the problem, a turn was started to track towards Birmingham. However, the pilot found that he was unable to maintain height and so, having worked out that he was probably in the Long Mynd area, planned to try and find the local gliding site, where he would land. The site, which is at 1500 feet amsl was in the base of the cloud at the time. The aircraft broke cloud in a valley by Ratlinghope where the cloud base was below the tops of the surrounding hills. The engine was, at this stage, still producing little or no power and the pilot remembered setting the aircraft up for a forced landing, but could not recall the final stages. The area was only marginally suitable and the aircraft struck a tree shortly before touchdown in a field at about 1250 feet amsl.

The first rescuers to arrive at the accident site did not see any ice on the aircraft but did notice a strong smell of fuel. Although the impact was at relatively low speed and the forward cabin area remained largely intact both occupants, who were wearing diagonal type harnesses, received serious injuries.

Examination of the accident site showed that the aircraft first impacted the ground with its right wing in an attitude that was right wing low, turning to the right, pitched nose up and skidding to the left. Shortly after the initial impact the left wing followed by the left rear fuselage, tailplane and fin impacted a tree. This impact, which occurred at about 60 kts, removed the outer left wing, the tailplane, the fin and rudder assembly and severely disrupted the rear fuselage area. The remainder of the aircraft travelled over a small lip that dropped down to an 11° downward slope where it continued for a distance of 180 feet before coming to rest. There was no fire.

Detailed examination of the aircraft wreckage showed that all the flying control surfaces were attached at impact and that all control rods and cables were connected and showed no evidence of mechanical restriction. The propeller, which had detached during the impact sequence, showed evidence of rotating at low speed *ie* at very low engine power or windmilling. Examination of the engine and its systems did not show any fault that would have caused a partial or total engine failure. The throttle was found to be in the near closed position; the carburettor heat to be in the hot position; the fuel selected to the left tank; the fuel boost pump on; the magneto and battery master switches off. It is understood from rescuers that the battery master switches and the magneto switch were turned off after the aircraft came to rest. Evidence was found of sufficient fuel being present in both fuel tanks.

As a result of the injuries sustained by the occupants of the aircraft the AAIB has recommended that the CAA study the type and extent of injuries sustained in aircraft accidents to assess the adequacy of diagonal upper torso restraint systems.