

**No: 4/91**

**Ref: EW/C1184**

**Category: 2c**

**Aircraft Type and Registration:** Air Command 532 Elite, G-BOVN

**No & Type of Engines:** 1 Rotax 532 piston engine

**Year of Manufacture:** 1988

**Date and Time (UTC):** 1 December 1990 at about 1543 hrs

**Location:** Lannock Hill, near Letchworth, Hertfordshire

**Type of Flight:** Private

**Persons on Board:** Crew - 1                      Passengers - 1

**Injuries:** Crew - Fatal                      Passengers - Fatal

**Nature of Damage:** Aircraft destroyed

**Commander's Licence:** Private Pilot's Licence (gyroplanes) with Flying Instructor rating

**Commander's Age:** 42 years

**Commander's Total Flying Experience:** 239 hours (of which 170 hours were on type)

**Information Source:** AAIB Field Investigation

The pilot/owner, who was a qualified gyroplane instructor, and a student pilot took off from the microlight airstrip at Gravely, north of Stevenage at about 1240 hrs for a dual instruction flight to Duxford aerodrome, where they landed at 1319 hrs. After an hour on the ground, during which it was re-fuelled, the gyroplane took-off from Duxford at 1419 hrs and returned to Gravely via the microlight facility at Newnham, where some circuit training was carried out. Observers at Duxford, Newnham and Gravely report that the flights appeared to be normal in all respects. After the gyroplane landed back at Gravely, it was again refuelled and the owner agreed to take a friend of the student pilot for a short flight.

Shortly before 1545 hrs, G-BVON was observed to take off from Gravely and climb towards Lannock Hill. The take-off appeared to be normal and the gyroplane levelled at an estimated height of 500 feet agl. Eye witnesses observed it flying over Lannock Hill, turning to its left in apparently level flight, before it was seen to have pitched nose down and to be descending steeply towards the ground. It struck the ground and both occupants received fatal injuries from an impact that was judged to be non-survivable. The emergency services were contacted and arrived at the site at 1605 hrs.

The weather conditions at the time were cloudy, with a lowest base of 2800 feet, and visibility around 6 kilometres. Winds were light. An aftercast, produced by the Meteorological Office, Bracknell, showed

a surface wind of 340°/06 kt, and the 1000 feet wind as 350°/10 kt. In these conditions the presence of clear air turbulence is highly unlikely. However, the visibility of around 6 kilometres could occasionally have made it difficult to determine accurately the gyroplane's attitude in relation to the horizon.

Examination of the wreckage at the accident site revealed that the aircraft had struck the ground in an almost inverted attitude with little horizontal speed, but a high rate of descent. There was no evidence of significant rotor rpm at impact. Fragments of the three-bladed wooden propeller and rudder were scattered over an area up to approximately 50 metres from the impact point indicating that separation had occurred in flight.

A detailed examination of the wreckage revealed that both main rotor blades had collided with the blades of the propeller and had also struck the rudder and aft structural tube. The direction of separation of the aft structural tube was consistent with the effect of the rotor strike. A large number of fractures were present in the structure and flying control system. None of these fractures revealed any evidence of pre-existing defects or pre-impact failure. A strip examination of the engine confirmed that no pre-impact defect was present within the unit.

The path of the rotor blades required to produce the strikes which were evident on the propeller, rudder and aft structural tube differs substantially from that experienced in normal flight. It is apparent that the aircraft was subject to an aerodynamic upset in flight that resulted in significantly reduced rotor disk loading and the reason for this upset could not be established.