

No: 4/90

Ref: EW/C1144

Category: 1c

**Aircraft Type and Registration:** Partenavia PN 68 B, G-OPED

**No & Type of Engines:** 2 Lycoming IO-360-A1B6 piston engines

**Year of Manufacture:** 1978

**Date and Time (UTC):** 18 December 1989 at 0914 hrs

**Location:** Redhill aerodrome, Surrey

**Type of Flight:** Private (business)

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

**Injuries:** Crew - None Passengers - None

**Nature of Damage:** Localised crushing and damage to leading edges of right hand wing, tail-plane and nose section. First pilot's windscreen cracked, pitot tube blocked with foliage and transponder aerial removed. Right hand main landing gear damaged; collapsed on landing

**Commander's Licence:** Private Pilot's Licence with IMC Rating

**Commander's Age:** 63 years

**Commander's Total Flying Experience:** 349 hours (of which 58 were as pilot in command on type)

**Information Source:** Aircraft Accident Report Form submitted by pilot and AAIB Field Investigation

The aircraft was on a private (business) flight from Stansted Airport to West Malling aerodrome, Kent, with two persons on board. The aircraft commander, who was a company director and owner of the aircraft, flew it from the left hand seat. The passenger, who was a professional pilot with a current Federal Aviation Administration Licence (USA) and 14,000 flying hours, occupied the right hand front seat. As the aircraft descended towards West Malling, in cloudy weather and poor visibility, it struck some trees. Full power was applied and the pilot and passenger, jointly on the controls, managed to raise the nose and the aircraft climbed away having sustained major structural damage. A Mayday call was made to Thames Radar, and the aircraft was landed at Redhill aerodrome some 27 minutes later. On landing the right main landing gear collapsed.

### History of the Flight

At about 0730hrs on 18 December 1989 the pilot and his passenger arrived at Stansted Airport to prepare for a flight from Stansted to West Malling aerodrome. The pilot booked out with Stansted ATC by telephone and collected a weather forecast from the Stansted self-briefing facility. He selected

the 0900 hrs Fixed Time Chart only, but did not take any Terminal Aerodrome Forecasts (TAFS). West Malling aerodrome is not itself included in the TAFS. He reports that he telephoned West Malling to advise his arrival time and was informed that the weather 'looked all right'. The pilot noted and recorded the Stansted ATIS which reported visibility of 6 kilometres, rain, 5 oktas of cloud at 1200 feet, 7 oktas at 3000 feet. Engine start clearance was approved at 0812 hrs, and, at 0826 hrs Stansted ATC transmitted a departure clearance "to leave the zone on track to Lambourne climbing to two four zero zero feet 'squawking' 3414".

The aircraft took off from runway 23 at 0830 hrs and thereafter followed the departure clearance and routeing before changing ATC control to Stansted Radar at 0831 hrs when the pilot requested clearance to stop his climb at 2000 feet, due to cloud. This was approved. At 0837 hrs the Stansted Radar Controller instructed the aircraft to change the 'Squawk' to 4321 and contact Thames Radar. At 0838 hrs the pilot contacted Thames Radar, reporting that he had just passed Lambourne, destination West Malling, and was flying at an altitude of 1800 feet. The Thames Radar Controller acknowledged this report and requested a 'Squawk' of 4561. This was selected and the Thames Radar Controller confirmed radar identification and cleared the aircraft to transit the zone maintaining VMC. Shortly after passing Lambourne the pilot reports that the aircraft started to yaw and pitch violently, and he dis-engaged the auto-pilot until normal smooth flight was regained. He attributed this to clear air turbulence and re-instated the automatic controls. At 0846 hrs the pilot informed the Thames Radar Controller that he was six miles and three minutes from West Malling and wished to change to that aerodrome frequency. The Thames Radar Controller replied that there was nothing known to affect their descent and to change the 'Squawk' to 4321.

The pilot reports that he dis-engaged the auto-pilot and commenced a descent towards West Malling intending to level the aircraft at 1000 feet (QNH) before contacting the aerodrome visually prior to flying a visual circuit and landing. The pilot made several attempts to contact West Malling but without success. He did not achieve visual contact with West Malling aerodrome before, as he describes it, 'we found ourselves engulfed in cloud and hitting the tops of trees'. The passenger recalls that, shortly before the contact with the trees, the aircraft yawed violently and that the pilot appeared to have some difficulty in maintaining control in turbulent conditions. The position where the aircraft struck the trees is 525 feet above mean sea level; West Malling aerodrome datum is 325 feet above mean sea level. Immediately following the impact the passenger selected the propeller and power levers to fully forward, and, with both occupants handling the controls, the aircraft was climbed away from the trees, having sustained major structural damage and with a portion of a tree-top embedded into the leading edge of the right wing. The aircraft's airspeed indicator had failed and was registering zero, the right side fuel tank gauge indicated zero contents, the stall warning light came on and remained illuminated, and there was a distinct smell of burning. It was subsequently established that other damage during the collision included the detachment of the aircraft's Transponder Antenna.

Shortly after climbing away from the impact area the pilot transmitted a 'Mayday' call to Thames Radar stating that he had 'struck some trees, was 'squawking' 4321 and requested radar vectors to the nearest airfield'. The Thames Radar Controller, who was obviously unaware of the loss of the

G-OPED's transponder signals, observed only one secondary radar return on his display that was indicating 4321, and this return was at a position approximately 7nm north-east of Biggin Hill. In fact at the time G-OPED was 2nm south-west of West Malling at a height that was below cover on the Thames Radar Controller's displayed radar picture. He suggested to the pilot of G-OPED to turn onto a heading of 240 degrees to fly direct to Biggin Hill. Unfortunately the heading of 240 degrees did not take G-OPED towards Biggin Hill, but instead towards Gatwick. Thereafter the Thames Radar Controller continuously attempted to positively identify the position of G-OPED on radar, but without success.

The pilot of G-OPED continued to fly the radar heading of 240 degrees and stabilised the aircraft at a height of about 800 feet above mean sea level. He was flying in poor weather with visibility restricted by rain and broken low cloud. At 0903 hrs he could see a large airport to his right which he correctly identified as Gatwick. He transmitted his recognition of this position to the Thames Radar Controller, who then advised Gatwick Approach Control. Immediately prior to the hand over, the Gatwick Approach Controller, the Gatwick Controller, who had been pre-warned that an aircraft was reported to be lost in the Brand's Hatch area but not its precise position, had advised a departing public transport aircraft to make an emergency turn for collision avoidance due to an unidentified radar return (G-OPED). (This resulted in the filing of an Aircraft Proximity Hazard Report (APHAZ) which is under separate investigation by the Air Traffic Control Investigation Department.)

Having established two-way communication with Gatwick Approach Control the pilot was offered radar service for an emergency landing at Gatwick. Due to the weather conditions he had by then lost sight of the Airport and was advised that his position was one mile from Redhill. He identified Redhill aerodrome and, because he suspected that the collision with the trees may also have damaged the aircraft's landing gear, elected to make a landing on the grass runway at Redhill. He was advised that the emergency services had been alerted, and that he was cleared to land on any runway. At 0909 hrs the pilot made radio contact with Redhill ATC and requested clearance to overfly the control tower so that the degree of damage to the landing gear could be assessed. After the flypast the pilot was advised of visible damage to the nose and right hand landing gear fairings. The aircraft completed a further circuit and, on landing, the right hand landing gear collapsed. Rescue vehicles were at the scene immediately and both occupants vacated the aircraft without injury.

### **Engineering report**

Examination of the aircraft showed that the right hand wing leading edge had been penetrated in two places outboard of the engine, and in both positions the structure had been destroyed back to the main spar, which itself was slightly buckled at the point of the inboard strike. Fuel lines and wiring had also been crushed in this area, and the stall warning detector vane had been destroyed. The right hand engine cowling had sustained some crushing damage, and the oil cooler matrix was partially blocked with vegetation. The right hand main landing gear attachments had been weakened in the impact with the trees and had subsequently failed on landing. The tailplane leading edges had been crushed locally with the severest damage on the right side. The aircraft's nose section had suffered some deformation of the outer skin. The pitot tube was completely blocked with vegetation, and the transponder aerial on

the underside of the fuselage had been removed. The first pilot's windscreen was cracked, and one of the right side cabin windows had been broken, probably by material thrown by the adjacent propeller. The propeller itself showed no signs of damage however its spinner was severely dented.

The aircraft's pitot-static system was tested and no leaks were found. The right hand altimeter was calibrated in situ, and showed smooth operation and an accuracy within +65 to -25 feet. The left hand altimeter showed signs of stiction and was removed for a laboratory calibration. This showed a lag in indicated altitude of about 85 feet (descending) below 2000 feet. This reduced to an average lag of 35 feet with light vibration applied, and with heavier vibration the deviations were within +30 to -15 feet of the reference altitude.

### **Meteorological information**

An aftercast of the actual weather conditions prevailing at the time of the accident was prepared by the Meteorological Office, Bracknell. This stated that a moist potentially unstable warm sector existed over the Biggin Hill area, with a warm front lying Colchester to Taunton moving slowly northwards. Cold front lying from Jersey to Plymouth moving northeastwards at 30 Kts. Further details were as follows:

Weather: Outbreaks of rain, moderate at times. (Dynamic convergence over France acted as a trigger for releasing potential instability).

Visibility: In general 6-10KM but with moist air and upslope motion the visibility may well have deteriorated to 1000M or less.

Cloud: Scattered occasionally Broken Stratus base 600 feet and, with upslope motion, Stratus base may well have become 300 to 400 feet. Broken/Overcast Strato-cumulus base 3000 feet tops 5000 feet, Overcast layers between 6500 and 12000 feet with thin layers above. However, with potential instability in evidence, there would probably have been embedded Cumulo-nimbus, base 6000 feet, tops 20000 feet.

The report also mentions that research work on downdraughts from non-frontal thunderstorms would suggest that a downdraught of between 20 and 24 knots could have occurred in these conditions although no thunderstorms were reported.

(N.B. Cloud bases quoted in the aftercast are heights above mean sea level.)