

No: 6/92

Ref: EW/G92/03/02

Category: 1c

**Aircraft Type and Registration:** Mooney M20K, G-BYEE

**No & Type of Engines:** 1 Continental TSIO-360-GB1 piston engine

**Year of Manufacture:** 1980

**Date & Time (UTC):** 5 March 1992 at 1045 hrs

**Location:** Bodmin Airfield, Cornwall

**Type of Flight:** Private

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

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

**Nature of Damage:** Damage to underside of fuselage, nose landing gear, right wing and propeller

**Commander's Licence:** Private Pilot's Licence with IMC and Night ratings

**Commander's Age:** 54 years

**Commander's Flying Experience:** 631 hours (of which 414 were on type)

**Information Source:** Aircraft Accident Report Form submitted by the pilot and subsequent enquiries by AAIB

The aircraft was on a VFR flight from Cranfield to Bodmin aerodrome. On arrival over the town of Bodmin, the pilot turned the aircraft onto a North-Easterly heading in order to locate the aerodrome, and joined the circuit on a right hand downwind leg for landing on the grass Runway 21. The approach was flown using full flap, fine pitch, at 70 kt IAS. The pilot reported that at approximately 100 yards from the threshold, a slight wind shear was encountered, and the aircraft began to sink slowly, despite the application of power. The aircraft had a high nose attitude at this time, and the rear fuselage came into contact with a fence which was positioned across the undershoot of the runway. This caused the aircraft to pitch down, touching down in the undershoot area, and resulted in the propeller blade tips striking the ground several times. The pilot was aware of the firm touchdown, but it was only after taxi in and engine shutdown that the damage to the aircraft was noted.

The surface wind at the time of the accident was from 210° at approximately 20 kt. Inspection of the Pilot's Operating Handbook for this type of aircraft reveals that for this headwind condition, the required Landing Distance over a 50 foot Obstacle is 1750 feet (paved, dry, level surface, unfactored), and the Landing Ground Roll is 810 feet (same conditions). Factoring these values in accordance with

the CAA General Aviation Safety Sense leaflet 7A, Aeroplane Performance, increases these figures for dry grass runway operation to 2100 feet for the Landing Distance Required, and 972 feet for the Landing Ground Roll (before application of the Additional Safety Factor recommended of 1.43). The actual distance available on Runway 21 at Bodmin is promulgated as 480 metres (1575 feet).

Runway 21 is delineated by white centreline markings, and corner markers at the extremities of the runway. A pair of orange and white marker boards are also positioned in line with the runway edges, but short of the actual runway threshold. The aerodrome site is such that the runways commence with an uphill portion, cross the high mid-point of the field, and end with a downhill section. No approach path indicator systems are available, so judgement of the correct approach path is left to the pilot.

The entry for Bodmin aerodrome in Pooley's Flight Guide indicates the method of centreline delineation, and states that *turbulence may be encountered on approach to Rwy 14 in strong winds and moderate to severe wind gradient on approach to Rwy 32, particularly at 0.5 mile point. Down gradient on Rwy 14 and 21.*

The UK AIP makes no reference to this method of runway marking, or the possibility of wind shear or turbulence on final approach.

The following safety recommendation has therefore been made:

**92-37** The aerodrome management should liaise with CAA Aerodrome Standards, with a view to updating the aerodrome entry for Bodmin in the AGA section of the UK AIP. This should indicate the possible hazards of windshear and turbulence on final approaches in strong wind conditions, in line with local knowledge.