No: 11/88 **Ref: EW/C1079** **Category: 1c**

Aircraft Type and Registration:	Mooney M20K, G-MUNE	
No & Type of Engines:	1 Continental TSIO-360-GB4 piston engine	
Year of Manufacture:	1982	
Date and Time (UTC):	23 July 1988 at 0718 hrs	
Location:	3.3 nm North West of Eastleigh Airport, Southampton	
Type of Flight:	Private	
Persons on Board:	Crew - 1	Passengers - 1
Injuries:	Crew - 1 (Fatal)	Passengers - 1 (Fatal)
Nature of Damage:	Aircraft destroyed	
Commander's Licence	FAA Commercial Licence with Instrument Rating, CAA Private Pilot's Licence with IMC Rating	
Commander's Age:	53 years	
Commander's Total Flying Experience:	2407 hours (of which 18 were on type)	
Information Source:	AAIB Field Investigation	

The aircraft had been imported into the UK from North America on a US Export Certificate of Airworthiness (C of A), arriving at Leavesden on 17 March 1988. Between that date and the accident flight, as no UK C of A had been issued for the aircraft, 12 of the 14 flights recorded by Leavesden ATC, were illegal. Of the two legal flights, the first was to position the aircraft at Elstree for avionic maintenance and the second, which took place two days before the accident flight, was for a C of A airtest, which it failed due to lack of climb performance. No record of further flight testing was found.

On the 22 July the pilot of the accident flight, with the permission of the owner, took the aircraft from the maintenance company at Leavesden, ostensibly for a sales demonstration flight. The maintenance company issued a "Fitness to Fly" Certificate which was however not valid, because a flight to demonstrate an aircraft with a view to its sale is not allowed for aircraft covered by the "A Conditions" of Schedule 2 of the Air Navigation Order. In fact this flight was to Cherbourg, via Fairoaks to pick up two colleagues.

The aircraft arrived at Cherbourg at 1632 hrs on the day before the accident flight. During that evening an aircraft engineer, who was also a pilot, arranged with the pilot of the Mooney to fly to Southampton (Eastleigh) and back the following morning. The purpose of this flight was for the engineer to meet with the contractor of another project upon which he was engaged.

When the aircraft took off from Cherbourg it was raining and there was low cloud. The forecast for Eastleigh was: "07-13 hrs: 180°/16 kt, 7 km, rain, 7 oktas of cloud at 800 feet. Tempo 07-13 hrs: 4 km, rain, 7 oktas at 300 feet. Prob 30 Tempo 07-09 hrs: 800 m, 8 oktas 100 feet.

It is not known whether the pilot obtained the Eastleigh forecast, which had been available since 0345 hrs, but he filed a VFR flight plan and took off at 0628 hrs. When the aircraft arrived at Eastleigh the observed weather was: 200°/12 kt, 4500 m, 5 oktas at 400 feet, 8 oktas at 500 feet, 16°C. However, the two aircraft which immediately preceded the Mooney into Eastleigh each broke cloud at around 300 feet.

G-MUNE called Southampton Radar at 10 nm range and was told to take up a "racetrack" pattern over Hamble airfield. The pilot reported that they were at 1500 feet, with ground contact. The controller asked him to report if he lost sight of the ground and offered either an IFR or an SVFR entry into the area. Unknown to the controller, the pilot was not qualified to accept the former and so, having accepted the latter, (at 0710 hrs) the aircraft was given advisory radar positioning downwind left hand, at 1000 feet, for runway 20. The pilot was then told to report visual contact with the runway. When the aircraft was 1.5 nm northeast of the airfield it had descended to 700 feet and, still having no sight of the runway, was turned by the radar controller onto a base leg at 600 feet. At 0714.5 hrs, the pilot declared no contact with the runway and was turned further left onto a centreline intercept heading of 240°. A few seconds later, as the pilot had still not reported visual contact, the controller decided to direct the aircraft around for a Surveillance Radar Approach and so instructed the pilot to climb to 1500 feet and turn right onto 270°.

Following confirmation of the climb and the heading, the pilot was told to change frequency to the "Talkdown" radar controller. On this frequency, at 0716 hrs, the pilot reported "coming up to 1500 feet" and, one minute later, was instructed to turn onto 020°. The controller had observed that, whilst still on the heading of 270°, the aircraft had appeared to wander slightly off its heading and so, when it was now seen to continue through the given heading of 020°, asked if they were unable to fly headings. There was no response to this message and no further communication from the aircraft was received.

The accident site was approximately 3 nm to the north-west of Eastleigh airport, in an area of relatively flat pasture-land, and at a height of 120 feet above that of the airport.

Examination of the wreckage on-site indicated that the aircraft had impacted the ground with a very high forward speed, in the region of 250 mph, with an approximate 65° pitch-down attitude, right wing low and spinning rapidly to the right. The landing gear was down and locked and the wing flaps were retracted. Because of the severity of the impact it was extremely difficult to assess the degree of power that was being produced by the engine, but there was evidence to indicate that it had not failed or been switched-off. There was evidence of a reasonable quantity of fuel having been present aboard the aircraft at the time of impact.

Detailed examination of the wreckage, after recovery to AAIB Farnborough, was hampered by the degree of fragmentation that had occurred at impact. After laying-out the wreckage it was possible to determine that all the flying control surfaces and major panels were correctly attached to the aircraft at impact. The flying control circuit components were examined for evidence of pre-impact control disconnect, but none were found. It was not possible to assess if a control restriction had occurred. Such flight instruments as could be identified showed no evidence of pre-impact fault, but no assessment could be made of the vacuum driven aircraft attitude and heading instruments. It was not possible to assess the pre-impact serviceability of the vacuum system that supplied these instruments except that there was evidence that the drive from the engine to the vacuum pump was intact. The badly damaged engine was dismantled and an exhaust valve in one of the six cylinders was found to have failed. The nature of the failure indicated that the valve had been in this condition for some time. The effect of this failure would have been to reduce the engine power, which would have become particularly noticeable during a full-power climb. The aircraft's cabin heating system was examined to establish if there had been a carbon monoxide gas leak into the cabin. There was positive evidence that this had not occurred.

Due to the nature of the accident, the pathology examination was inconclusive.

No UK log books had been raised for the aircraft, the engine or the propeller, and no flight times or maintenance records could be found from the time the aircraft left North America until the accident. Partially completed worksheets for the C of A maintenance checks were available. No flight manual, check list or weight schedule were found and it is understood that they had not been available to the pilot.