No: 8/87 **Ref: 1c**

Aircraft type and registration:	Socata MS894A Rallye Minerva G-BCAD	
No & Type of engines:	1 Franklin 6A-350-C1 piston engine	
Year of Manufacture:	1973	
Date and time (UTC):	18 January 1987 at 1301 hrs	
Location:	Honiton, Devon	
Type of flight:	Private (pleasure)	
Persons on board:	Crew — 1	Passengers — 2
Injuries:	Crew — 1 (Fatal)	Passengers — 2 (Fatal)
Nature of damage:	Aircraft destroyed	
Commander's Licence:	Private Pilot's Licence	
Commander's Age:	42 years	
Commander's Total Flying Experience:	155 hours (of which 106 were on type)	
Information Source:	AIB Field Investigation	

On the morning of Sunday 18 January a slow moving warm front lay between Lands End and the south-west of Scotland. The area in which the accident occurred was influenced by a cold, moist, southerly airstream ahead of this front. There was extensive stratus and strato-cumulus cloud over the area with the main base at 1200 feet. The freezing level was at 5000 feet, but there was a freezing layer between, approximately, 1200 feet and 3000 feet. The final part of the flight was over the hills which lie between Taunton and the south Devon coast. The average height of these hills is between 850 and 900 feet and the 1145 hrs weather observation for Dunkeswell, height 850 feet, gave 8 oktas of stratus, base lower than 150 feet. The visibility was 500 metres in freezing drizzle and the temperature was zero degrees Celsius. These conditions were ideal for the formation of severe airframe icing.

It was planned to fly from Staverton to Exeter, at 1500 feet under Visual Flight Rules (VFR). The briefing facilities available at Staverton were not used and the flight was booked out, by telephone, on the pilot's behalf. The aircraft took-off at 1203 hrs.

The pilot called Bristol Lulsgate at 1214 hrs, and was offered Instrument Flight Rules (IFR) or Special VFR for his transit of the Bristol Special Rules Zone. He chose the latter. When the Lulsgate overhead was transmitted, at 1229 hrs at 1300 feet, the visibility was 3 kilometres with 5 oktas stratus at 700 feet and 7 oktas strato-cumulus at 1200 feet. At 1234 hrs G-BCAD informed London Flight Information Service that he was flying at 1300 feet in Instrument Meteorological Conditions (IMC). The transmission faded and the aircraft did not reply to subsequent calls from London.

At 1250 hrs a call was made on the Exeter Approach frequency. The pilot said that he was heading 210°, at 1500 feet, IMC, and was unsure of his position. The controller told the aircraft

to climb to 2600 feet and explained that this was the safety altitude, within 25 nautical miles (nm), to the north-east of Exeter Airport. At 1253 hrs, the aircraft was identified, by the Exeter Radar controller, 19 nm to the north-east. It was then established that the procedure would be radar vectoring to a surveillance radar approach to runway 26. At 1254 hrs, the aircraft was level at 3000 feet.

Just before 1257 hrs the pilot reported that the aircraft was picking up ice on the leading edge. Clearance was given to descend to 2600 feet. It was then reported that the controls were freezing and the pilot was given a heading of 280°, to take the aircraft clear of a television mast which was 1536 feet above mean sea level. When steady on 280° a further clearance to 2000 feet was given. The aircraft continued to descend and, when passing 1800 feet, the pilot again reported icing and said that the aircraft was getting heavy. At 1300 hrs, at 1400 feet, the pilot reported that he was unable to stop the descent. At 1301 hrs the call "Mayday, Mayday, May..." was recorded on the Exeter approach frequency.

Witnesses, working in a restaurant about 50 yards from the point of impact, heard the noise of the crash, but by the time they had reached the aircraft it was burning fiercely.

Subsequent AIB examination of the wreckage at the accident site showed that G-BCAD had struck the ground at an angle of between 55 and 65° to the horizontal, on a magnetic heading of 305°. The symmetric distribution of the wreckage indicated that the aircraft was neither yawing nor rolling immediately before the impact.

The force of the impact severely disrupted the fuel tanks and the subsequent fierce fuel fire consumed large portions of the aircraft structure and systems. It was possible, however, to establish that, at impact, the leading edge automatic slats were retracted and that the flaps were up. The trim mechanism indicated that almost full "aircraft nose-up" longitudinal trim had been applied.

Marks on the propeller indicated that it was rotating at impact but under little or no power, and examination of the cockpit controls showed that the throttle had been pulled fully back and the fuel selector turned to "OFF".

The post-crash fire destroyed any evidence of the pattern of any ice formation. It was, however, noted that the aircraft was not equipped with a heated pitot tube and the only ice protection was a conventional carburettor heat system. A feature of the Rallye series is the large horn balance on the elevator, presenting to the airflow a gap $\frac{5}{8}$ inches wide and up to 7 inches high between the closure plates on the elevator and the tailplane. This gap, which extends some 21 inches from the tailplane leading edge to the elevator hinge line, appeared the most likely area for ice accretion within the flying control system.

The pilot had flown 8 hours of instrument flying training, but did not hold either an Instrument Rating or an IMC Rating. It is stated in the Limitations section of the aircraft Flight Manual that flight is prohibited in icing conditions. This warning is placarded in the cockpit.