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

Aircraft type and registration:	Scheibe SF-23 Sperling G-BEDU	
No & Type of engines:	1 Lycoming 0-235-C1 piston engine	
Year of Manufacture:	1959	
Date and time (UTC):	22 March 1987 at about 1705 hrs	
Location:	Near Bellaghy, Co Londonderry, Northern Ireland	
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:	Private Pilot's Licence	
Commander's Age:	34 years	
Commander's Total Flying Experience:	208 hours (of which 4½ were on type)	
Information Source:	AIB Field Investigation	

The aircraft, a single engined two seat high-wing monoplane, had been purchased by the pilot on 15 March 1987. On that date he had flown the aircraft from Burn aerodrome, North Humberside, via Blackpool and Newtownards to Toome, Northern Ireland. He held a valid Private Pilot's Licence with a current medical certificate. He had started flying in March 1978, and since then had recorded a total of 208 flying hours, all in light single engined aircraft. His total time on the Sperling was 4 hours and 30 minutes which was recorded on the transit flight from Burn to Toome.

On the morning of 22 March 1987 the aircraft was positioned at the private field near Bellaghy which the pilot used as a landing strip. The aircraft made one short flight in the local area, with two persons on board, after which it was landed and subsequently re-fuelled up to full tanks capacity. The fuel used was MOGAS (4-star) reportedly purchased from a local garage. At about 1655 hrs the pilot re-entered the aircraft with another passenger, to make a further local flight. According to eye-witness accounts the engine start was apparently normal and the pilot spent some minutes checking the engine and flight controls before positioning the aircraft for the start of the take-off run. The take-off direction was towards the west, which was along an up-hill slope and towards a line of trees. The pilot did not use the full field length that was available to him. Witnesses reported that the take-off run was prolonged and it was not until the aircraft was approaching the trees when it was pulled into a steep nose-up attitude, reaching a height variously estimated as between 50 and 150 feet, when it appeared to stall as the nose dropped rapidly and the aircraft crashed in a steep nose down attitude into a cultivated field behind the line of trees. Initial examination of the wreckage confirmed that the high degree of damage sustained by the nose and cockpit areas was consistent with that sustained by an aircraft which has suffered an aerodynamic stall close to the ground, and the

accident is considered to have been non-survivable. There was no fire.

A more detailed on site examination of the wreckage confirmed that the aircraft had struck the ground with low forward speed but high rate of descent, in a steep nose down and slight right wing down attitude. Examination of the flying control system revealed no evidence of any pre-impact failure. The softness of the ground taken in conjunction with the wooden propeller construction and the relatively low design power output of the engine made it impossible to determine whether the engine was delivering power at the time of impact. However, an examination of the engine after removal from the accident site revealed no evidence of any pre-impact mechanical failure. An analysis of the remaining contents of the fuel tank selected at the time of the accident showed that it was suitable for the engine and free from significant contamination. The aircraft documentation showed that the machine was last inspected on 6 February 1987 when its Permit to Fly was renewed.

Prior to acquiring the Scheibe Sperling G-BEDU, the pilot had owned and operated a Piper Cub J3-65, and his log book records that he had made at least 32 take-offs and landings in this aircraft from the same field. There is, however, a significant difference between the take-off run, and, more importantly, the take-off distance required to achieve a height of 50 feet, required by the two aircraft. Typical figures published show that at the maximum permitted take-off weight the take-off run required by the Piper Cub was 370 feet, whilst the Scheibe Sperling required 590 feet. The take-off distance (to the 50 feet height) required by the Sperling was 1380 feet. All these figures refer to take-off from a hard, level surface. Aircraft performance is subject to many variables, the most significant in the case of the accident flight being the slope of the field, the length, texture, and moisture content of the grass, and the distance of the nearest obstacle (the trees) from the start of the take-off run. In order to advise pilots that these variables should be taken into account, the Civil Aviation Authority (CAA) recommends that safety factors should be applied to the take-off distance required. These recommendations are contained in Aeronautical Information Circular No.52/1985.

The weather conditions, at the time of the accident, were fine. Although no accurate measurements were recorded in the Bellaghy immediate area, the 1720 hrs observation recorded at Belfast/Aldergrove Airport was a surface wind of 260/03 knots, visibility in excess of 10 kilometres, 2 oktas of cloud at 2000 feet. The air temperature was plus 07°C, and the dew point plus 02°C. Belfast/Aldergrove is approximately 15 nautical miles from the accident site. Under these conditions when calculating the safe take-off distance required by G-BEDU on the accident flight, and applying the recommended safety factors due to slope and texture of the surface, the take-off distance required to climb the aircraft to a height of 50 feet was 2100 feet. Had the pilot used the maximum field length available to him in taking off in a westerly direction, then the take-off run available was 1296 feet. From the position at which it was reported that the take-off commenced, the take-off run available was 1214 feet.