No: 12/89 **Ref: EW/C1128** **Category: 1c**

Aircraft Type and Registration:	Brasov IS-28M2A G-BHRS motor glider
No & Type of Engines:	1 Limbach SL 1700 EA piston engine
Year of Manufacture:	1979
Date and Time (UTC):	29 July 1989 at 1754 hrs
Location:	Near Woodford Aerodrome, Cheshire
Type of Flight:	Pleasure
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 Group A and Glider Instructor's Rating
Commander's Age:	53 years
Commander's Total Flying Experience:	61 hours on powered aircraft (of which 9 were on type) and 362 glider hours
Information Source:	AAIB Field Investigation

History of the flight

At the start of the day's flying the aircraft was inspected and refuelled to a fuel quantity sufficient for 4 hours flying. It was used for two short flights and refuelled again before being flown by an instructor on a further short detail during which a touch and go landing was carried out. This instructor found the aircraft to be serviceable and its climb performance normal. The runway in use was 25, the weather was good, and the surface wind was estimated to be westerly at about 8 knots.

At about 1740 hrs the instructor who had flown the second detail of the day climbed into the aircraft with a passenger for another short detail of circuits and landings. When the aircraft took off, its ground roll was longer than usual, it appeared to climb in an abnormally nose-high attitude and its rate of climb was low. Soon after lift-off it turned approximately 30° to the left. It was normal practice for the landing gear to be left down to a height of about 400 feet in case of engine failure and a need to reland. On this occasion, the landing gear was retracted at a much lower height and the aircraft was seen to descend slightly before it passed over the airfield boundary and resumed a slow climb. When it was about 200 metres beyond the airfield boundary at a height estimated by witnesses variably as

between 150 and 500 feet it began a further turn to the left, whereupon the bank angle increased sharply and it spun to the ground. One witness, who was inside a hanger, heard the engine operating at what he thought was low power as the aircraft approached. He then heard a surge of power a second before the sound of the impact. Another witness, who was close to the flight path, thought the engine noise ceased before the impact.

Both occupants received fatal injuries. The pilot was found to have his left shoulder harness disconnected and loosely draped over his left shoulder; the harness buckle was found on the cockpit floor unattached to any of the straps. The passenger was held in his seat by his right shoulder harness, which was the only strap that had to be cut before his body could be removed. It was not possible to determine from the evidence whether or not both safety harnesses had been fastened at impact but the nature of the injuries to both occupants were such that the accident would not have been survivable with or without safety harnesses.

Aircraft information

The aircraft propeller had three pitch settings, fine, coarse and feather. Propeller pitch was controlled from a lever in the cockpit which normally rested vertically down. The lever was used to set or release the coarse pitch spring locks. Pitch change was achieved by lifting this lever to an intermediate position and then lowering it again to the vertical. The propeller could be feathered by moving the lever fully up. The propeller should normally have been selected to fine pitch for take-off and the pitch should have been checked by the rpm achieved at the start of the take-off roll. The check list for both 'Power Check' and 'Take-Off' stated 'THROTTLE - FULL, CHECK 2600 TO 2800 RPM'. For the propeller to be changed from coarse to fine pitch with the engine stopped, the lever had to be raised to the half-up position and lowered; with the engine running, power had to be reduced to 1400 rpm, the lever raised to one-third up and then slowly lowered, when a rise in rpm would be noted. The normal climb speed of the aircraft was 50 kt and the stalling speed at the accident weight was 38 kt. It was known to have a tendency to drop a wing in the stall and its spin was described by the CFI of the club as rapid and violent.

Pilot information

Of the 9 hours experience the pilot had on type, 8 had been flown more than two years earlier. He had flown a dual check and one solo flight in the aircraft in the previous December and January but had not flown again until the day of the accident, when he flew one detail before the accident flight. There was no evidence of any medical condition on the part of the pilot or the passenger that could have contributed to the accident.

Wreckage Examination

The aircraft lay on a golf course just outside the south-western boundary of the airfield. It had clearly impacted the ground in a very steep attitude, in the order of 80° nose-down. The impact had pushed

the engine back into the cockpit area and caused the fin/tailplane assembly to "whiplash" forwards. It was also evident from the relationship between the wreckage and the initial impact marks that the aircraft had been spinning to the left. There had been no pre- or-post-crash fire.

The position of the pilot's throttle lever suggested that it had been closed prior to impact with the ground and the condition of the propeller showed that very low, or no, power had been present at impact. On-site it was determined that no malfunction was apparent in the aircraft's flying controls and there was no evidence of pre-crash structural failure.

The engine and fuselage of the aircraft were taken to AAIB Farnborough for more detailed examination. The propeller hub pitch mechanism appeared to have been in working order prior to the accident and, although the propeller pitch setting could not be determined with certainty, there was no evidence to indicate that the propeller might have been in coarse pitch at impact.

The engine was examined and no defects were found with the basic mechanics of the unit. The ignition magneto was bench-tested and functioned correctly. The simple carburettor was strip examined and no defects were found.

No mechanical, structural or electrical defects were found which could have contributed to the accident.