

No: 11/89

Ref: EW/C1133

Category: 1c

Aircraft Type and Registration: PA 18 Super Cub 150 G-BBDI

No & Type of Engines: 1 Lycoming C 320 piston engine

Year of Manufacture: 1965

Date and Time (UTC): 24 August 1989 at 1813 hrs

Location: Portmoak Airfield, Scotlandwell, Near Kinross, Scotland

Type of Flight: Glider towing

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 with IMC and night rating

Commander's Age: 22 years

Commander's Total Flying Experience: 750 hours (of which 520 were on type)

Information Source: AAIB Field Investigation

History of the flight

The aircraft was regularly used to tow gliders at the Scottish Gliding Union gliding site at Portmoak Airfield. It had been used throughout the day of the accident and in the evening was towing gliders as part of a programme of air experience flights for the staff of a nearby hotel. After the towing aircraft had been fully refuelled, the first aerotows took off in a westerly direction towards Loch Leven but, due to a change in the weather, the tug pilot had changed the direction of take-off to an easterly one. The pilot was joined by another private pilot who was to be given some experience of aerotowing and he occupied the rear seat of the aircraft. At 1810 hours the aircraft with its tow rope was hooked up to a 2-seat glider and took-off to the east, turning right after take-off and then heading west. At a height of about 450 ft the glider pilot decided that the cloud base was too low and cloud cover too extensive to permit a further climb and so he carried out a normal release of the tow rope and turned left as is standard practice. The tug aircraft continued turning right and was seen to fly across the airfield from south to north at a height between 300 and 400 feet. The tow line was seen to be trailing normally behind the aircraft. As it reached the northern boundary of the airfield, it banked to the left and, according to some eyewitnesses, the nose of the aircraft was raised. As the turn continued the aircraft nose dropped and it spun to the left rotating two or three times before striking the ground almost

vertically. Both occupants sustained fatal injuries at impact and the aircraft was completely destroyed by fire. Examination of the pilots at autopsy did not reveal any medical condition that may have contributed to the accident.

Club members and their visitors immediately ran from the launching point and attempted to extinguish the fire using hand held fire extinguishers and a small light water trailer. More extinguishers were brought across from the club house but the fire was too severe for them to be effective. The Kinross fire service arrived after some 15 minutes and finally extinguished the fire.

Meteorological information

An aftercast obtained from the Meteorological Office, Bracknell showed a weak cold front with minor waves was lying east to west some 5 to 7 miles south of the area and moving slowly south. The weather was mainly dry with patches of drizzle. Visibility was greater than 10 km. The surface wind was assessed as 090°/ 6 kt and that at 1000 feet was 270°/23 kt. The temperature was +13°C but it would have been some 4°C warmer about one hour earlier before the southerly passage of the weak front. It was noted that these conditions of temperature and humidity were conducive to the formation of carburettor ice at low power settings. With the surface front in its assumed position relative to Portmoak there would have been discontinuity at about 500 to 800 feet above the site. The low level wind associated with the cold undercut would have been the first to veer to north or northeast and be reinforced by flow up the Forth of Tay, coupled by any sea breeze component which would have veered the surface flow even further but still probably at less than 10 kt. From the wind structure a flight through the discontinuity could have been uncomfortable.

Examination of the wreckage

The aircraft had crashed on a southerly heading just inside the northern boundary of the airfield onto a strip of rough ground bordering a drainage ditch. An examination of the wreckage and accident site revealed that its attitude at impact had been steeply nose down, estimated at 75° to 80° to the horizontal, and that it had been yawing to the left and drifting to the west. The flaps were found set in their mid position and there were signs that the propellor had been rotating at the time but under low power. A partial strip examination of the engine and its related systems showed that they were mechanically sound with no defects apparent, although fire damage had occurred. The carburettor air intake heat system was set to COLD AIR, and the fuel selector valve was found to be set for the right hand tank position. The extent and severity of the post impact fire left no doubt that a considerable quantity of fuel was being carried at the time of the accident.

Although the aircraft had suffered an intense post accident fire, sufficient debris remained to establish that at the time of impact its structure had been complete and intact and that all the flying control systems were correctly connected. The tailplane trim mechanism was found close to its mid-travel position and no evidence of any control system jams was discovered. One of the left wing attachment strut fittings at the fuselage was found broken but a close examination revealed this to be a bending failure; this and all other observed damage being as a result of the impact. The front pilot's seat was found securely locked

in the forward position.

During the wreckage examination it was noticed that the tow rope was threaded between the left tailplane and its elevator with evidence to show that it had been there during the fire. The rope had been burned through just behind the elevator trailing edge leaving some 12 ft of rope to the tug attachment rings, which were found directly behind the aircraft's tail. Although it initially appeared that the rope may have influenced the operation of the elevator, the position in which the rope was found on the ground, i.e. curving out to the left and then to the right in front of the wreckage, made it most likely that it had caught on the elevator during the several turns of the spin to the ground.

Location:	Goodwood Aerodrome, West Sussex
Type of Flight:	Training
Persons on Board:	Crew - 1 Passengers - None
Injuries:	Crew - None Passengers - N/A
Nature of Damage:	Nose gear upper structure fractured, damage to nose, windscreen and propeller
Commander's Licence:	Commercial Pilot - License with Instrument Rating
Commander's Age:	44 years
Commander's Total Flying Experience:	7,400 hours Rotary Wing 1,250 hours Fixed Wing (of which 31 were on type)
Information Source:	Aircraft Accident Report Form submitted by the pilot

Following a normal approach to grass runway 24 the aircraft touched down fairly heavily and bounced. It was then thrown into the air a second time by a bump on the landing strip before touching down a third time on its nosewheel. The nose lowered gently as the nosewheel upper attachment bracket parted, and the pilot steered the aircraft off the landing strip before engaging it to taxi.