ACCIDENTS INVESTIGATION BRANCH
Department of Trade and Industry

Bolkow BO 208C Junior G–ATVB

Report on the accident near Hambledon, Surrey on 6 January 1972

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Department of Trade and Industry
Accidents Investigation Branch
Shell Mex House
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11 December 1972

The Rt Honourable Peter Walker MBE MP
Secretary of State for Trade and Industry

Sir

I have the honour to submit the report by Mr G M Kelly, an Inspector of Accidents, on the circumstances of the accident to Bolkow BO 208C Junior G–ATVB which occurred near Hambledon, Surrey on 6 January 1972.

I have the honour to be
Sir
Your obedient Servant

V A M Hunt
Chief Inspector of Accidents

Accidents Investigation Branch
Civil Accident Report No EW/C 399/01

Aircraft:	Bolkow BO 208C Junior G–ATVB
Engine:	Rolls Royce Continental O–200A
Owner and Operator:	A O Boyle, Conifer House, Fulking, near Henfield, Sussex
Pilot:	Mr F E Wright – Killed
Passengers:	Nil
Place of Accident:	Near Hambledon, Surrey
Date and Time:	6 January 1972 at approximately 1207 hrs
	All times in this report are GMT

Summary

During a private solo cross-country flight under Visual Flight Rules (VFR) the pilot descended to continue the flight below cloud.

While the aircraft was flying 20 or 30 feet above the ground in hilly country and in conditions of poor visibility and low cloud the engine noise died away abruptly. Some 20 seconds later the aircraft collided with a tree. The pilot was killed.

The report considers that the pilot's decision to attempt to continue the flight below cloud was the result of inexperience.

1. Investigation

1.1 History of the flight

Before setting out on a private solo cross-country flight from Shoreham to Luton along a route to the west of the London control zone, the pilot referred to the 0600-1800 hrs area weather forecast for Kent, Surrey and Sussex and obtained the 1100 hrs weather reports for London, Heathrow and Luton from Air Traffic Control (ATC) at Shoreham. He told the Air Traffic Controller that he intended to make the flight under Visual Flight Rules (VFR).

He took off shortly before noon. At 1156 hrs he reported by radio to Dunsfold ATC with the information that his height was 1,700 feet and that he was flying in Visual Meteorological Conditions (VMC). At 1205 hrs he told Dunsfold that he was passing abeam of the aerodrome and was changing radio frequency to Farnborough ATC. At 1207 hrs he told Farnborough of his point of departure and his destination and, after a short hesitation, that he expected to be over Farnborough at 1210 hrs. At the same time he asked for a magnetic course to steer to reach Farnborough.

Farnborough ATC gave him a course of 340° (M) and noted an echo on the radar screen at the appropriate position. A minute or so later the echo had disappeared and the Air Traffic Controller called the aircraft on the radio. There was no response. After several unsuccessful calls the controller alerted a number of aerodromes and requested information about the aircraft, and when this proved fruitless he alerted the appropriate ATC authorities and the police.

About this time the aircraft was seen flying some 50 feet above the ground, apparently under control. It was also heard flying in cloud or fog, by other witnesses, one of whom was standing on high ground in clear weather overlooking a fog-filled valley. Some of these witnesses reported that the engine was running roughly. All heard the noise of the engine abruptly reduced about 20 seconds before the sound of a crash. The aircraft was seen to appear out of the fog – visibility was reported as about 100 metres at the time – flying some 20 to 30 feet above the ground with little or no sound from the engine. It then hit a tree, severed an overhead power cable, and crashed inverted into the side of a hill. There was no fire, but the pilot was killed.

1.2 Injuries to persons

Injuries	*Crew*	*Passengers*	*Others*
Fatal	1	–	–
Non-fatal	–	–	–
None	–	–	–

1.3 Damage to aircraft

The aircraft was destroyed.

1.4 Other damage

An overhead electricity power cable was severed and a wire fence damaged.

1.5 Crew information

Frederick Edward Wright, aged 35, held a private pilot's licence, first issued on 6 July 1971, endorsed for aircraft in Group A and valid until 5 July 1976, and an R/T licence for VHF only. He held no night or instrument rating of any sort. His most recent medical certificate was dated 19 September 1971 and was valid until 21 October 1973.

At the time of the accident Mr Wright had accumulated a total flying experience of 98 hours and 55 minutes, of which 7 hours 20 minutes were in Bolkow Junior aircraft. In the 28 days previous to the accident he had flown 3 hours and 30 minutes, all in G–ATVB.

1.6 Aircraft information

The Bolkow BO 208C Junior aircraft is a two-seater, all metal, high-wing monoplane with a Rolls Royce Continental 0-200-A engine. G–ATVB had been built in West Germany in 1966 and at the time of the accident had a valid certificate of airworthiness in the Special category. This form of certificate of airworthiness does not include a requirement for the aircraft to be maintained in accordance with an approved schedule, or for engine and airframe maintenance log books to be kept.

Maintenance of G–ATVB appeared to have been satisfactory and to have been carried out in accordance with the recommended procedures in the Manufacturer's Maintenance Manuals.

The aircraft was fitted with a full instrument flying panel and full night flying equipment, with one VHF communications transceiver and one VHF navigation receiver.

1.7 Meteorological information

The forecast for Kent, Surrey and Sussex issued by the Meteorological Office at Gatwick covering the period from 0600 hrs to 1800 hrs predicted patches of low cloud, locally 6/8 in extent occasionally covering high ground with a base generally at 500 to 1,000 feet and tops 1,000 to 1,500 feet, clearing slowly during the morning. Visibility was expected to be 1,500 to 4,000 metres generally but 100 to 500 metres in fog and hill fog, improving generally to 4 to 7 kilometres in the early afternoon. The freezing level was given as 2,000 feet, but with a shallow sub-zero level at the surface at first, mostly in the south and west.

An aftercast for the section of the route from Shoreham to Farnborough prepared by the Meteorological Office indicated that between the South Coast and the Downs the weather was clear except for some patches of medium cloud above 3,000 feet. Over the Downs there were extensive patches of low stratus cloud with tops at 900 to 1,200 feet and the base generally at 500 to 800 feet, occasionally covering high ground. In patches of hill fog the visibility was about 100 metres.

The altimeter setting for the area (the Chatham QNH) was 1017 mb at 1200 hrs and this setting was found on the aircraft's altimeter sub-scale.

1.8 Aids to navigation

The aircraft carried a VHF communications transceiver and a VHF navigation receiver. VHF direction finding, radar, and radio navigation aids were available on the ground and serviceable. Topographic maps of scales 1:250,000 and 1:500,000 and International Aeradio radio navigational charts were carried in the aircraft.

1.9 Communications

VHF R/T communication between the aircraft and Shoreham, Dunsfold and Farnborough was normal until the aircraft failed to respond to calls from the Farnborough Controller.

1.10 Aerodrome and ground facilities

Not relevant to this investigation.

1.11 Flight recorder

Not fitted and not required to be fitted.

1.12 Examination of the wreckage

Inspection at the scene of the accident showed that the aircraft had been flying nose-up and left wing low when its left wing struck a tree. The collision broke the main spar in two places and the wing became detached. The aircraft had then struck the ground in a nose-down attitude almost inverted. The engine became partially detached on impact. There were indications that it was running at about 1,500 revolutions per minute when it came into contact with the ground.

Detailed examination of the wreckage revealed no evidence of pre-crash failure or malfunction of the aircraft, its flying controls, or of the engine. There was evidence of ample fuel in the tank at the time of the accident.

1.13 Fire

There was no fire.

1.14 Survival aspects

The accident was not survivable. The seat belt and shoulder harness remained intact and fastened but the impact with the ground was largely taken by the plastic canopy over the cockpit and the pilot sustained very severe head injuries which were immediately fatal and which would not have been prevented by a protective helmet.

1.15 Tests and research

None.

1.16 Medical aspects

Mr Wright had been discharged from the Royal Air Force in 1965 after an attack of idiopathic epilepsy in 1963.

He did not refer to his discharge and the reason for it in applying for the medical examination for his private pilot's licence, and was passed fit.

However, no evidence came to light in the post mortem examination to suggest that this or any other medical condition contributed to the accident.

2. Analysis and Conclusions

2.1 Analysis

The flight from Shoreham until the aircraft was abeam Dunsfold was apparently without incident and would have been in VMC at the reported height of 1,700 feet. Thereafter patchy low cloud with tops to about 1,300 feet north of Dunsfold would have made it difficult, if not impossible, for the flight to have continued at 1,700 feet without losing sight of the ground.

Navigation above cloud would not have been difficult, but it was unlikely that a VFR descent at the end of the flight would have been practicable. Appropriate courses of action would have been to return to Shoreham, or to continue below cloud and in sight of the ground.

It is likely that the pilot navigated by map reading as far as Dunsfold. The area forecast predicted that the low cloud might disperse during the morning and the visibility improve considerably in the early afternoon. It may well have seemed to a pilot of limited experience that a reasonable course of action would be to descend and remain in sight of the ground. A more experienced pilot would, it is considered, have made use of the weather reports available on the radio before arriving at such a decision.

There was no evidence of any circumstance that would have obliged the pilot to descend. Such an emergency occurring at the reported height of 1,700 feet would have left plenty of time for a radio call; the pilot was proficient in radio telephony and in contact with Farnborough ATC. It may be inferred, therefore, the aircraft having been seen flying low but apparently under control shortly before the accident and there being no indication of any malfunction – apart from the reduction in power immediately preceding the accident – that the pilot elected to descend and continue by visual reference to the ground.

In the event he found that the weather in the lower levels had not cleared as quickly as the forecast predicted, and it may well be that his radio call for a magnetic course to steer was an indication that he was beginning to get into difficulties.

The high ground north of Dunsfold rises steeply from the plain, and the pilot would have very quickly found himself dealing with intermingled low cloud, fog, and hills. By the time he had descended to the height of 50 feet or so at which he was seen to be flying it is doubtful that he could have avoided collision with the ground by climbing through the cloud layer. It will be recalled that he was not rated for flying in instrument meteorological conditions.

A shallow sub-zero temperature layer at the surface was predicted in the forecast and was in all probability still extant, making the weather conditions at low level very conducive to carburettor icing. Such icing would not itself cause the sudden loss of power that occurred 20 seconds or so before the

accident, but too long a delay in operating the carburettor heat control, or the operation of the adjacent mixture control by mistake (a mistake that has been made in the past, although, not so far as is known, by Mr Wright) could do so. However, the pilot's competence, as assessed by his instructors, suggests that he would be aware of the possibility of carburettor icing, and would have taken the correct action. It is considered more likely therefore that the loss of power occurred when the pilot closed the throttle when he realised the flight could no longer be continued, or in the hope of making some sort of landing in the limited open space ahead of him.

There was no appearance of recklessness, carelessness or inefficiency in the pre-flight preparation, or the conduct of the flight, and it is concluded that the pilot's adoption of a course of action that quickly led him into dangerous flight conditions was the result of inexperience.

2.2 Conclusions

(a) *Findings*

(i) The documentation of the aircraft was in order and it had been satisfactorily maintained.

(ii) There was no evidence of any pre-crash failure or malfunction of the aircraft or its engine and there was ample fuel for the flight.

(iii) The pilot was properly licensed for the proposed flight but had only limited flying experience and possessed no instrument flying qualifications.

(iv) The pilot elected to attempt to continue his VFR flight below cloud and within sight of the ground.

(v) The low cloud base over the high ground and the poor visibility associated with it precluded safe flight in that area below cloud.

(vi) The pilot's failure to recognise the danger of the conditions into which he was flying was the result of inexperience.

(b) *Cause*

The accident was the result of an attempt to continue a VFR flight by visual reference to the ground in poor visibility beneath cloud covering high ground.

G M Kelly
Inspector of Accidents

Accidents Investigation Branch
Department of Trade and Industry
December 1972