

ACCIDENTS INVESTIGATION BRANCH  
Department of Trade

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**Cessna F172H G-AYDC**  
**Report on the accident at Morecambe**  
**Bay, near Humphrey Head, Lancashire,**  
**on 9 December 1972**

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**List of Civil Aircraft Accident Reports issued by AIB in 1974**

<i>No</i>	<i>Short title</i>	<i>Date of publication</i>
1/74	McDonnell-Douglas DC8 – 63 CF N 801 WA and Aerospatial Caravelle 6 N 00–SRG approximately 10 nautical miles southeast of Lands End VOR, March 1973	April 1974
2/74	Piper PA 30 Twin Comanche G–AXRW at Shipdham Aerodrome, Norfolk, January 1973	April 1974
3/74	Slingsby T61A G–AYUO near Wycombe Air Park, Bucks., February 1973	May 1974
4/74	Viscount 802 G–AOHI at Ben More Perthshire, Scotland, January 1973	May 1974
5/74	Owl Racer 65-2 G–AYMS at Greenwich Reach, River Thames, London, May 1971	May 1974
6/74	British Caledonian Airways BAC 1-11 at Corfu Airport, Greece, July 1972	May 1974
7/74	Wallis WA–117 Autogyro G–AXAR at Farnborough, Hants., September 1970	<i>(forthcoming)</i>
8/74	AA–1 Yankee G–AYHD at Beverley Nursery, near Uxbridge, Middlesex, April 1973	June 1974

Department of Trade  
Accidents Investigation Branch  
Shell Mex House  
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London WC2R ODP

April 1974

*The Rt Honourable Peter Shore MP  
Secretary of State for Trade*

Sir,

I have the honour to submit the report by Mr P J Bardon, an Inspector of Accidents, on the circumstances of the accident to Cessna F172H GAYDC which occurred at Morecambe Bay, near Humphrey Head, Lancashire on 9 December 1972.

I have the honour to be  
Sir  
Your obedient Servant

W H Tench  
*Chief Inspector of Accidents*



Accidents Investigation Branch  
Civil Aircraft Accident Report 9/74  
(EW/C432)

*Aircraft:* Cessna F172H G-AYDC  
*Engine:* Rolls-Royce Continental O-300-D 145 hp  
*Registered Owner  
and Operator:* Air Navigation and Trading Company Ltd  
*Pilot:* Mr A Lindley - Killed  
*Passengers:* None  
*Place of Accident:* Morecambe Bay, near Humphrey Head, Lancashire.  
*Date and Time:* 9 December 1972 at 0940 hrs  
All times in this report are GMT

## Summary

Approximately 20 minutes after leaving Blackpool airport on a VFR flight to a landing ground at Cark, Lancashire, witnesses near to Cark heard the brief sounds of an aircraft engine followed by a crash. Weather conditions at the time in the area were rain with icing and poor visibility. There were no eyewitnesses to the crash.

The wreckage of the aircraft was found below the high water level in Morecambe Bay about a mile southeast of Cark. The pilot, who was the sole occupant, had received fatal injuries. The report concludes that the accident was the result of a loss of control consequent upon the pilot encountering bad weather conducive to serious carburettor icing, which presented him with a task beyond his training and experience.

# 1. Investigation

## 1.1 History of flight

The pilot of G-AYDC had been authorised by the chief flying instructor of Air Navigation and Trading Co Ltd (ANT) to position the aircraft from Blackpool airport to Cark landing ground near Grange Over Sands, Lancashire. No passengers were to be carried. The decision as to the suitability of the weather for the flight had been left to the pilot and although he telephoned Blackpool aerodrome control giving details of the proposed flight there is no evidence that the pilot visited the airport meteorological office or contacted Preston weather centre or anyone at the Cark landing ground.

The pilot prepared his own aircraft and after refuelling, taxied out and took off at 0922 hrs setting course for Cark. This was the last reported sighting of G-AYDC and there was no further radio contact with the aircraft. Cark is approximately 25 miles north of Blackpool and at 0940 hrs witnesses in the vicinity of the landing ground heard the sound of an aircraft engine accelerating, followed by a brief silence then a crash.

Over the Cark area between 0930 and 1030 hrs weather conditions at the time were poor with a heavy shower of rain and hail, and visibility reduced to about a mile. A few minutes after the accident a person near Humphrey Head, being curious about an unidentified object in Morecambe Bay, proceeded on foot across the sand and mudflats and found it to be the wreckage of G-AYDC. He was unable to release the pilot who had received fatal injuries, so he at once informed the police and coastguard authorities.

## 1.2 Injuries to persons

<i>Injuries</i>	<i>Crew</i>	<i>Passengers</i>	<i>Others</i>
Fatal	1	-	-
Non-fatal	-	-	-
None	-	-	-

## 1.3 Damage to aircraft

Destroyed.

## 1.4 Other damage

None.

## 1.5 Crew information

Pilot: Mr Alan Lindley, age 19.

Licence: Private Pilot's Licence, (first issued in April 1972).

Total flying hours: 71 hours 45 minutes.

Flying hours on type: 13 hours 05 minutes.

Flying hours during the 30 days prior to the accident: 3 hours 5 minutes.

Mr Lindley began his powered flying training in May 1971 though he had previous gliding experience with the Air Training Corps. His training file showed only one period of instrument flying instruction in April 1972 and there is no record of the amount of solo instrument flying he had carried out.

## 1.6 Aircraft information

The Cessna F172H is an all metal, high wing, four seater monoplane with a fixed pitch metal propeller. The aircraft was equipped for instrument flying with an artificial horizon and a turn and slip indicator. It had been constructed by Reims Aviation SA, France in May 1970 and had a valid United Kingdom Certificate of Airworthiness (C of A) in the General Purpose Category. It was a requirement of the C of A that the aircraft be operated in accordance with the manufacturers operating instructions and recommendations.

### 1.6.1 *Airframe*

The airframe had been maintained in accordance with the approved maintenance schedule and the last inspection Check 3 (600 hours) was carried out on the 27 October 1972. The aircraft had flown a total of 1,244 hours up to the 6 December 1972.

### 1.6.2 *Engine*

The Rolls-Royce Continental 0-300-D engine was manufactured by Rolls-Royce Motors Ltd, Crewe on the 17 October 1969 and had run 1,244 hours since new. It had been maintained in accordance with the approved schedule and there was no abnormal history on the engine. Since the last Check 3 the engine had run 52.20 hours without trouble. It was not fitted with carburettor air temperature gauge.

### 1.6.3 *Carburettor heat*

The 1970 Cessna F172H Owners Manual gives the following information on the application of carburettor heat.

Check list for 'Let down' states; 'As required to prevent carburettor icing'.

Check list for 'Before landing' states; 'Carburettor heat should be applied prior to any reduction or closing of the throttle'.

#### 1.6.4 *Weight and centre of gravity*

The aircraft's weight at the time of the accident has been established as 1,826 lbs and the centre of gravity 39.8 inches aft of datum. Both these values were within the authorised limits.

#### 1.7 **Meteorological information**

##### (a) *Blackpool*

The weather at Blackpool airport was fair when G-AYDC departed and although there was no cloud, visibility was only 3 kilometres, the temperature was 1.7° Centigrade and the humidity was 100 per cent.

##### (b) *Morecambe Bay*

Appreciation of the weather conditions prevailing over the Morecambe Bay area between 0930 and 1030 hrs on the day of the accident prepared by the Meteorological Office at Preston contained the following information;

General situation:

The winds were light with extensive mist over the tidal flats during the first part of the morning. An unstable air mass over the sea was producing shower clouds which would spread into coastal areas during the morning.

Winds: Sea level, southerly/12 knots, 2,000 feet, 240°/25 knots, temperature 0° C.

Clouds: 4/8-7/8 cumulus becoming cumulonimbus, base 1,000-1,500 feet, tops above 10,000 feet.

Visibility: Variable 500m - 2 kilometres, 500m in showers.

Weather: Showers of rain or hail, mist or fog patches.

Airframe icing and turbulence: Severe icing and turbulence may have occurred in cumulonimbus activity.

##### (c) *Cark landing ground*

A witness at the landing ground reported a heavy rain shower between 0830 and 0930 hrs with poor visibility and low cloud, and a pilot who conducted a search in the area when approaching Cark reported lowering cloud base with patches of rain and drizzle. This pilot also experienced carburettor icing.

#### 1.8 **Aids to navigation**

Not applicable.



## 1.9 Communications

Two way communications were established on R/T between G-AYDC and Blackpool aerodrome control on 118.4 MHz but after leaving the circuit there was no further contact. Cark landing ground has no radio facilities.

## 1.10 Aerodrome and ground facilities

Cark is a private landing ground situated near the coast at the north side of Morecambe Bay. No aerodrome facilities are provided.

## 1.11 Flight recorder

Not fitted and not required.

## 1.12 Wreckage

The aircraft had crashed onto the sand flats in Morecambe Bay below the high water mark. It had struck the sands at a steep angle with the left wing low. All the wreckage was contained within a radius of 20 feet and the pattern indicated a high speed impact in a spiral dive to the left. There was a complete break up of the port wing; the engine and nose landing gear had been pushed back into the cockpit area; the fuselage had telescoped and the starboard wing was broken at the wing root and had rotated forward.

Though the wreckage was covered by the tide on four occasions before it could be examined, it was still possible to establish the following:

Fuel selector	—	Both tanks 'on'.
Ignition	—	Both magneto's 'on'.
Throttle	—	Closed position.
Carburettor heat control	—	'Cold' position.
Pitot heater switch	—	No evidence of position.
Flaps	—	Flap screw jack evidence, 'fully up' position.

Owing to severe impact damage the cockpit instrument readings provided no reliable evidence. The pre-crash integrity of the flying control circuits could not be established because of the disintegration of wings and fuselage. The engine was stripped and examined. There was no evidence of any pre-crash failure or defect. Damage to the propeller indicated that although it was rotating when it struck the ground, little or no power was being delivered by the engine. The carburettor which is mounted beneath the engine had been torn off and only part of it was recovered. The sparking plugs were heavily contaminated and corroded by mud and sea water. It was not possible to establish their pre-crash condition.

## 1.13 Medical and Pathological information

A post mortem examination revealed no medical condition that could have any bearing on the accident.

#### 1.14 Fire

There was no fire.

#### 1.15 Survival aspects

The accident was not survivable.

Although the pilot was secured by a lap-strap he had been subjected to deceleration forces in excess of the seat belt attachment limitations.

#### 1.16 Tests and research

Nil.

#### 1.17 Other information

##### 1.17.1 Carburettor icing

As the meteorological conditions prevailing at the time of the accident were highly conducive to the formation of carburettor ice, the following extract from a United States National Transportation Safety Board publication is relevant. The document NTSB – AAS-72-1 dated January 1972, entitled *Special Study of Carburettor Ice in General Aviation* stated the following:

‘During the period 1965/69, there were a total of 360 General Aviation accidents in the United States involving carburettor ice as a probable cause or factor, with 47 aircraft destroyed and 313 substantially damaged.’ The document continues:

‘Carburettor icing can occur with ambient temperatures as high as 37° Centigrade and humidity factors as low as 50%. Therefore be especially alert to carburettor icing possibilities with combinations of ambient temperature below 21° Centigrade and humidity above 80%. Prior to closed throttle operation, such as for a descent, apply FULL carburettor heat and leave on throughout the closed throttle sequence and periodically open the throttle during extended closed throttle operation so that enough heat will be produced to prevent icing’.

##### 1.17.2 Search and rescue

Search and rescue is normally initiated when an aircraft is reported overdue by the authorities at the destination aerodrome. The pilot of G-AYDC could not file a flight plan as these can only be transmitted to airfields which are on the airfield teleprinter network (AFTN), or linked to the AFTN by a parent station scheme. Cark, which was a private landing ground had neither of these services. Therefore a pilot flying to a landing ground such as Cark should, before take-off, advise a responsible person at the destination of the intended flight and estimated arrival time, and arrange for that person to notify the Air Traffic Services (ATS) in the event of non-arrival. The pilot of G-AYDC had not done so. It was only by pure chance that the ATS were informed when an alert person raised the alarm and notified the coastguard and police. Blackpool aerodrome control received the information at 1036 hrs and instructed the pilot of an ANT aircraft

flying in the Blackpool area to carry out a search in the vicinity of Cark. This pilot subsequently identified the wreckage of G-AYDC about 1¼ mile south of the Cark runway, but by this time the incoming tide was about to cover the wreckage.

## 2. Analysis and Conclusions

### 2.1 Analysis

The pattern of the wreckage indicates that the aircraft struck the ground at a relatively high airspeed whilst in a spiral dive to the left. The other significant evidence established by the investigation was as follows:

- (a) The aircraft had entered an area of bad weather, consisting of heavy rain, turbulence and low cloud shortly before the accident.
- (b) These conditions were also highly conducive to carburettor icing.
- (c) The pilot was not experienced, particularly in instrument flying.
- (d) There was no evidence of any pre-crash mechanical or technical defect.

These facts in themselves do not enable any firm conclusions to be reached, though the inference is clear. It is possible that when the aircraft entered the bad weather area there was a rapid build up of ice in the carburettor. Whether or not the pilot selected carburettor heat in an attempt to clear the ice is not known, but if he did, he had returned the heat control to the cold position by the time the accident occurred. One reason for supposing that he may have momentarily selected carburettor heat was the sound of an engine noise heard shortly before the impact, indicating a sudden restoration of power. However, whether the pilot was successful or not in clearing the carburettor ice is secondary to the fact that he lost control of the aircraft. In circumstances such as this inexperienced pilot found himself, he could easily have allowed his attention to be distracted from the flight instruments with the result that the aircraft entered a spiral dive. To recover from a spiral dive on instruments, particularly one that is entered inadvertently, requires a degree of instrument flying training which this pilot had not received.

This accident is yet another instance of an inexperienced private pilot losing his life because he continued into adverse weather conditions which he failed to recognise as being beyond his capabilities. It can be argued, particularly in view of the pilot's youth, that the accident could have been avoided if he had been more closely supervised, not only to ensure that he obtained a weather report before take-off but also that he fully understood its implications and knew what he should do if the conditions deteriorated below a certain point. If the pilot had been a student this would be a valid argument. But as he held a Private Pilot's Licence, he was entitled to decide for himself whether to commence or continue a flight. It has to be assumed by those authorising the flight that this discretion will be properly exercised and that the pilot will take into account all the factors, including his own experience and the suitability of the weather. On this occasion the pilot had been specifically instructed to exercise his own discretion as regards the weather and in view of that it is all the more inexplicable that he did not obtain a

weather report before take-off. He would at least have known, had he done so, that he was liable to encounter turbulence and icing in cumulonimbus cloud en route to Cark in which case he may well have decided at least to postpone the flight until the conditions improved. By not adequately briefing himself, he was probably unprepared for the severity of the conditions he met when he decided to penetrate the area of bad weather near his destination. This unpreparedness undoubtedly contributed to his losing control of the aircraft.

## 2.2 Conclusions

### (a) Findings

- (i) The pilot was correctly licensed but inexperienced in instrument flying.
- (ii) The aircraft had been properly maintained and its documentation was in order. The weight and centre of gravity were within the authorised limits.
- (iii) There was no evidence of pre-crash failure or malfunction.
- (iv) At the time of the accident the weather conditions in the area were turbulent and highly conducive to carburettor and airframe icing.
- (v) There was no evidence that the pilot obtained a weather report before take-off.
- (vi) After encountering bad weather the pilot lost control of the aircraft in Instrument Meteorological Conditions.
- (vii) At impact the aircraft was in a spiral dive to the left at a relatively high speed.

### (b) Cause

The probable cause of the accident was a loss of control resulting from the pilot continuing flight into adverse weather conditions beyond his training and experience.

P J Bardon  
*Inspector of Accidents*

Accidents Investigation Branch  
Department of Trade

April 1974