

## ACCIDENT

<b>Aircraft Type and Registration:</b>	Dragon Chaser, G-CHNP
<b>No &amp; Type of Engines:</b>	1 Polini Thor 250 piston engine
<b>Year of Manufacture:</b>	2012 (Serial no: 84)
<b>Date &amp; Time (UTC):</b>	31 October 2015 at 1457 hrs
<b>Location:</b>	Near Pitsford Water, Northamptonshire
<b>Type of Flight:</b>	Private
<b>Persons on Board:</b>	Crew - 1                      Passengers - None
<b>Injuries:</b>	Crew - 1 (Fatal)          Passengers - N/A
<b>Nature of Damage:</b>	Aircraft damaged beyond economic repair
<b>Commander's Licence:</b>	National Private Pilot's Licence
<b>Commander's Age:</b>	71 years
<b>Commander's Flying Experience:</b>	242 hours (of which 2 were on type) Last 90 days - 17 hours Last 28 days - 4 hours
<b>Information Source:</b>	Field Investigation

## Synopsis

The aircraft, a flex-wing microlight, was flying low near Pitsford Water, a reservoir, in benign weather conditions. It turned and descended, hit the ground and somersaulted, sustaining damage. First aid was administered to the pilot, but he had been fatally injured. Some witnesses recalled hearing the aircraft's engine, and some believed its tone had changed or it had ceased. The investigation identified that the conditions were suitable for carburettor icing to have occurred, and that the field into which the aircraft crashed would have been suitable for a forced landing, but no specific cause of the accident was identified.

## History of the flight

The pilot regularly flew flex-wing (solo) and three-axis microlight aircraft (under instruction), and had flown G-CHNP, a flex-wing microlight, on two occasions previously.

The aircraft took off without incident from Northampton/Sywell Aerodrome at 1445 hrs. The weather conditions were benign, with light winds, good visibility and no low cloud. Nothing is known of the flight from shortly after takeoff until a number of witnesses sighted the aircraft in flight close to the accident site. None of them had a lengthy uninterrupted view, but together their accounts provided an impression of the final minutes of the flight.

One witness saw the aircraft, which was flying "lower than aircraft usually do". She saw it make a sharp left turn, onto a south-westerly heading, and descend "quite steeply" before it passed out of her view. A second witness reported that he first saw the aircraft in level flight

at about 100 ft agl, before it gained a little height and then began to descend, turning to the left onto a more southerly track. The descent was at a constant angle for a period until, at about “the height of a house”, the descent steepened and the aircraft struck the ground hard. He recalled hearing nothing until the impact with the ground, which he heard quite clearly; this led him to believe that the engine either had not been running or had been running quietly.

The attention of a third witness was first drawn by the sound of the aircraft. She stated that the sound became quieter, probably abruptly, and the aircraft was descending quite steeply before it disappeared from sight behind a tree, after which she heard a “crunch”. A fourth witness heard an engine and looked around to see the aircraft, which was “coming down quite steeply” before it hit the ground. It appeared to be under control and he thought the pilot might have been attempting to land.

A fifth witness heard the “loud-ish noise” of the aircraft and saw it “very low” close to the accident site. He described that the engine “feathered” as if the throttle had been closed and the aircraft then “dropped”, with the front wheel of the trike impacting and digging into the ground, after which the aircraft somersaulted and then came to rest. Two of the witnesses ran to the aircraft after it crashed and attempted to give first aid but the pilot had been fatally injured.

### **The pilot**

The pilot began training towards a National Private Pilot’s Licence on flex-wing aircraft in July 2008 and first flew solo in August 2009, after 46 hours dual training. He passed the skills test for issue of the licence in April 2010, and purchased a Dragonfly microlight, which he flew regularly. In October 2014 he began flying a three-axis microlight with an instructor, but had not flown it solo.

He had accrued a total of 242 hours, of which 105 were under training. He had made a medical declaration, which satisfied the applicable requirement.

### **Post-mortem examination**

A post-mortem examination of the pilot was carried out by a Home Office pathologist. He found that the pilot had died from chest injuries. No evidence of any medical condition likely to be incapacitating was found, and toxicological testing revealed nothing remarkable.

The pathologist reported:

*‘In cases such as this, specific injuries are looked for in order to help answer potential investigative questions. I am not aware of the specific controls of the aircraft concerned in this incident, but the soles of the shoes, feet, legs, arms and hands in this case did not display any damage or injuries that could be considered “control injuries”. However, interpretation of the presence or absence of such injuries must be done with caution, and the lack of any such injuries in this case should not be considered evidence that [the pilot] was not holding/operating the controls of the aircraft at the time of impact.’*

## Aircraft information

The Dragon Chaser is a single-seat deregulated (SSDR) aircraft which is the combination of the Dragonfly trike and a Chaser 2 sail. G-CHNP had fixed landing gear with spats fitted around both the mainwheels. The aircraft is controlled by weight shift. G-CHNP was fitted with an electrically-driven pitch trim that moves the trike's attachment fore and aft along the keel tube with a total travel of around 5 cm, thus reducing the pilot's pitch control forces.

The wing was of conventional flex-wing construction and had seven battens per side giving the aerodynamic profile.

The engine was a single-cylinder, two-stroke Polini 250 Thor, driving a fixed two-bladed 'pusher' propeller. Fitted to the engine was a reduction gearbox, with an inertial clutch mechanism. The engine speed was controlled using either a hand-lever or a foot-lever, and there was a foot-operated disc brake fitted to the nosewheel. The typical still-air landing distance from a threshold height of 15 m for this aircraft is around 250 m.

The aircraft was fitted with an Aircotec Piccolo electronic variometer, mounted on the control bar.

As the aircraft was operated within a de-regulated environment, there was only a limited requirement to keep technical logs. The owner of the aircraft stated that he was not aware of any problems with the aircraft prior to the flight.

## Metrological information and the position of the sun

Reports from local aerodromes, witness evidence, and photographs, showed that the weather was fine and dry around the time of the accident. The METAR for Cranfield Aerodrome, 18 nm south-east of the accident site, stated that the wind was from the south at 4 kt varying in direction between 120° and 210°, visibility was 8 km with no significant cloud, the temperature and dewpoint were 15° and 11°C respectively, and the mean sea level pressure was 1022 hPa.

At the time of the accident, the sun's elevation was 12° on a bearing of 228°T.

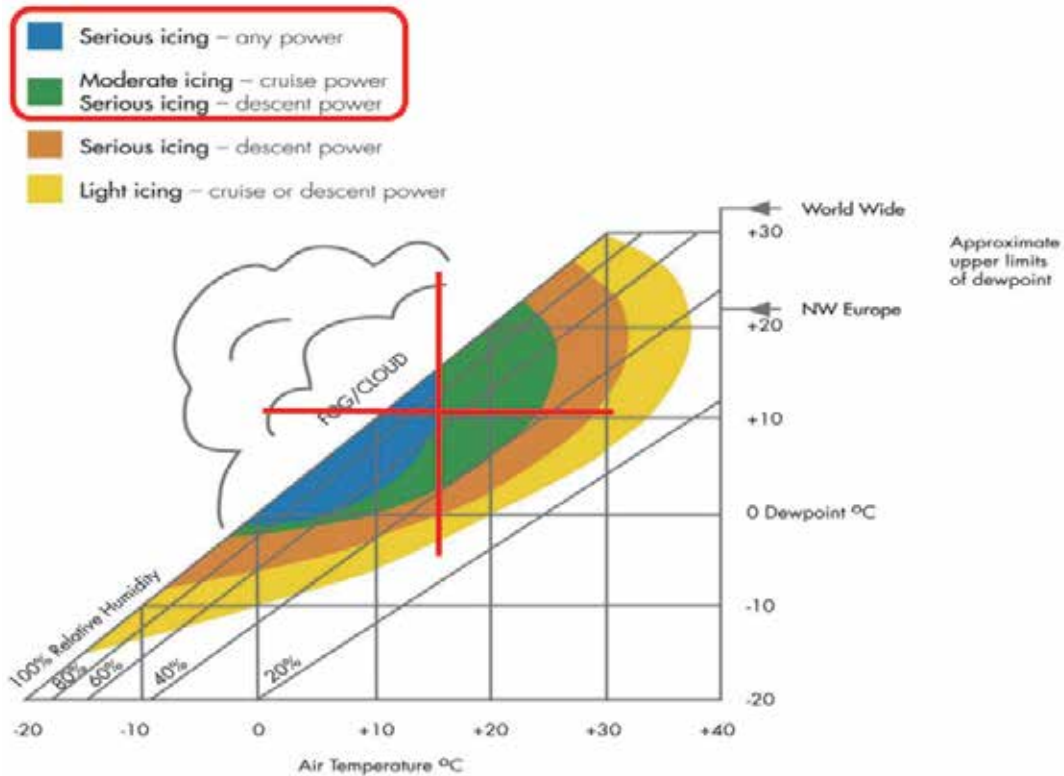
The CAA has published advice on carburettor icing<sup>1</sup>, including a graph showing a range of values of temperature and dewpoint and the degree of icing which might be expected. The values reported at Cranfield are shown as red lines on Figure 1, illustrating that the conditions were on the boundary between '*serious icing – any power*' and '*moderate icing – cruise power/serious icing – descent power*'.

---

### Footnote

<sup>1</sup> CAA Safety Sense Leaflet 14 '*Piston Engine Icing*'.

---



**Figure 1**

CAA Carburettor Icing chart  
 (The temperature and dewpoint reported at Cranfield Airport  
 are shown by the two red lines)

### Recorded information

Data was recovered from a variometer, which had been mounted on the control bar. This showed peak values of barometric rate, recorded in the 'last flight memory', but it was not possible to establish whether the unit was powered during the accident flight.

### Accident site and wreckage

The aircraft crashed in a large field adjacent to Pitsford Water (Figure 2). The field was approximately 400 m long and 100 m wide, and the wreckage was found at the top of a gently sloping knoll. The ground was smooth and there was a grassy crop, approximately 1-2 cm high, growing in the field. The land owner had not been asked for permission to land in the field.

There were several ground marks all located within approximately 16 m from the nose of the aircraft. These marks were consistent with the nose wheel striking the ground heavily in a direction approximately parallel with the hedge running along the edge of the longest side of the field. The aircraft appeared to have performed a 'somersault', which resulted in two holes in the ground being made, first by the apex of the wing and then by the top of the mast, before the aircraft came to rest in an upright position. The ground marks were aligned on a bearing of between 240° and 245°T.



**Figure 2**

The accident site viewed in approximately the direction of the aircraft's travel

The aircraft structure was inspected and no evidence of a pre-existing structural failure or control problem was found.

Both the propeller blades had failed in a chord-wise direction at approximately half way along their respective lengths. The left landing gear leg had been deformed rearwards which, when inspected in conjunction with the ground marks, was consistent with the left mainwheel striking the ground shortly after the nosewheel. The spat on the left wheel was damaged and had detached. The rearward deformation of the left main gear leg was such that the wheel spat could have entered the propeller disc and caused the blades to fail.

Fuel was found in the carburettor bowl and there was fuel in the damaged fuel tank.

The drive shaft for the electric trim was extended by approximately 5 cm, which equates to a highspeed trim position. The electric trim unit was damaged and was disengaged from the drive screw, hence there was a high degree of confidence that the aircraft was in a high-speed trim position when it struck the ground.

### **Engineering examination**

The wreckage was taken to AAIB headquarters in Farnborough for a more detailed examination.

The battens were removed from the wing and checked against the manufacturer's full scale drawing; nothing significant was found. The engine was taken to the UK distributor where

it was stripped. There was no evidence of any mechanical failure or abnormal running of the engine or the gearbox. The spark plug appeared normal, and a satisfactory spark was observed during testing. It was concluded that the engine was probably producing significant power, because both propeller blades had broken.

### Analysis

The pilot was suitably licenced and in current practice, the aircraft was reported to be serviceable, and the weather was suitable for the flight, although the CAA chart showed that there was a risk of carburettor icing.

There was no evidence of the progress of the flight from the takeoff until witnesses saw the aircraft close to the crash site. From the witnesses' recollections, the aircraft appeared to be under control and under power before, from a low height, it entered a descent which steepened and ended with impact with the ground. The accounts of engine noise drawing attention to the aircraft suggest that the engine was running at least until a change in tone was heard; the aircraft was already at a low height when this occurred. The reason for this low height could not be determined; it may have been a consequence of a problem with the aircraft, or intentional on the part of the pilot, or because of some other factor.

Descriptions of the engine note changing or ceasing suggest the engine power may have reduced, either in response to a pilot input or as a consequence of an engine problem. The combination of dew point and temperature indicate that conditions were on the border between those in which '*serious icing*' of the carburettor might occur at any power and '*moderate icing*' at cruise power; '*serious icing*' might occur at descent power, but carburettor icing leaves no evidence and thus no conclusion could be reached in this regard.

The field in which the aircraft crashed was suitable for a landing, either pre-planned or forced; because the land-owner's permission had not been sought, an intentional landing seems unlikely. In either event, any landing could have been challenging because the approach would have been almost directly into a low, setting, sun, and on the knoll before a slightly-down-sloping surface.

Although the post-mortem examination did not identify any evidence of incapacitation in flight, this possibility could not be ruled out.