BEA
Bureau d'Enquêtes et d'Analyses
pour la sécurité de l'aviation civile

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REPORT
ACCIDENT

In-flight loss of control in a turbulent atmosphere, collision with vegetation, then the ground

Aircraft	Pipistrel Taurus 503 microlight identified 34-ABF
Date and time	13 July 2015 at 16 h 15[1]
Operator	Private
Place	Eygliers (05)
Type of flight	General aviation
Persons on board	Pilot and one passenger
Consequences and damage	Pilot fatally injured, passenger seriously injured, microlight destroyed

[1]Except where otherwise indicated, times in this report are local.

This is a courtesy translation by the BEA of the Final Report on the Safety Investigation. As accurate as the translation may be, the original text in French is the work of reference.

1 - HISTORY OF FLIGHT

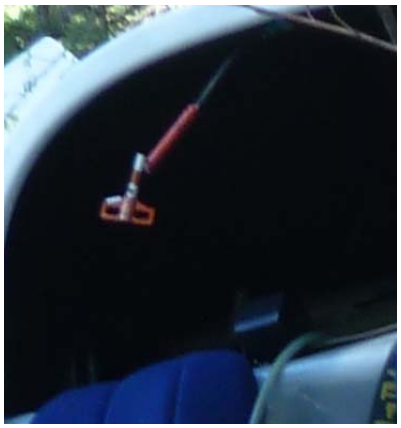
The pilot, accompanied by a passenger, took off unaided from unpaved runway 16 from Mont-Dauphin Saint-Crépin (05) aerodrome for a local flight. When he reached an altitude of about 1,900 metres, he decided to shut down the engine. A short time later, a pilot in flight noticed the microlight take a right turn then quickly go into a spin. The pilot asked the passenger to activate the emergency parachute by pulling the handle, which the latter did, though the parachute did not deploy. The microlight collided with some trees and then the ground on the side of the mountain.

2 - ADDITIONAL INFORMATION

2.1 Wreckage examination

The wreckage was found flat between trees in a very steep part of the mountain at an altitude of 1,700 metres. The speedbrakes were retracted, the flaps were extended in L configuration (''*Landing*'' that's to say 17°). The flight controls were damaged but connected. The pitch trim control lever was found in a pitch-up position. The engine was in the retracted position and its cowling was closed. The fuel tank still contained some petrol.

The emergency parachute was stowed in its housing and its control handle was found outside its sheath, which was itself torn from its support on the fuselage. This suggests that it had been activated by one of the occupants. Before the takeoff, the safety pin had been removed. It was attached to the ignition key ring on the instrument panel.



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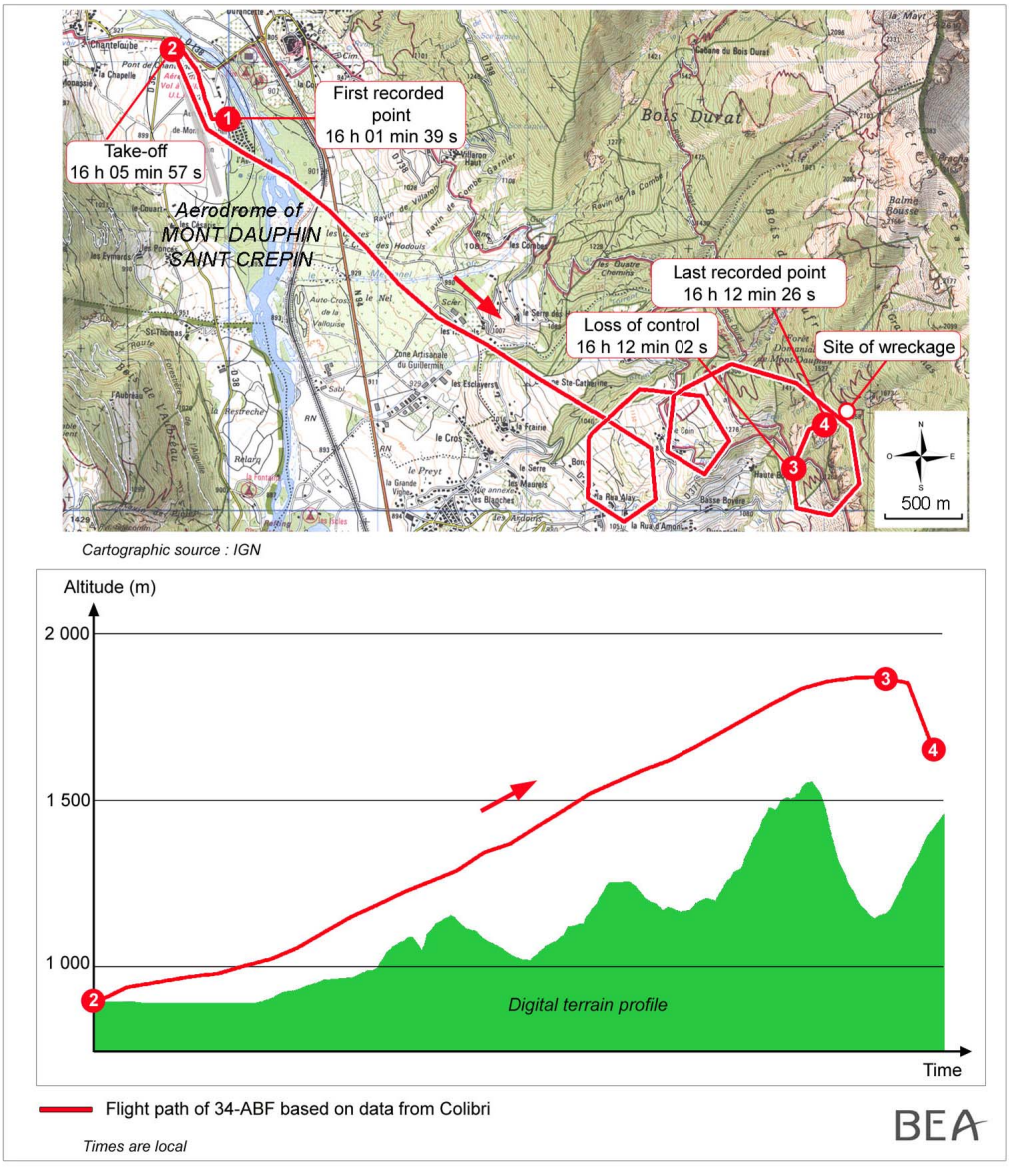
Emergency parachute control handle

Source BEA

Parachute safety pin

The microlight was equipped with an IGC Colibri computer. This computer records GNSS tracks on an SD card, which allowed the flight path to be calculated.



2.2 Meteorological conditions

The meteorological conditions estimated at the site were as follows:

- wind from the south at 15 to 25 kt;
- strong valley and slope thermal updraughts from the southwest;
- very cloudy sky covered by thick par cirrus;
- strong turbulence.

2.3 Information on the pilot

The pilot, aged 71, had a microlight pilot's licence with authorization to carry a passenger. He had a total of 16,000 flying hours of which 350 on the Taurus since its purchase in 2007.

2.4 Information on the microlight

The flight manual states that to retract the engine into its compartment, it is necessary to fly at a speed of 80 km/h, cut the magnetos, extend the flaps to the first detent (5°) then lift the nose to diminish speed and allow the propeller to stop.

The stall speeds are 71 km/h in clean configuration and 63 km/h in a configuration with flaps 17°. In a turbulent atmosphere, it is recommended to fly with the flaps in a neutral position.

On the Taurus, the pitch trim, flap, speedbrake and landing gear are located between the two seats. Thus, the pilot has all of these controls at his left hand side, allowing the passenger to sit in the left seat.

2.5 Testimony

2.5.1 Eyewitness

A glider pilot, also an instructor, had taken off from Mont-Dauphin Saint-Crépin aerodrome and was in the same sector as the microlight. He confirmed that the atmosphere was very turbulent there and that he found himself in an area of windshear. He said that he saw the Taurus about 200 metres above him and at a lateral distance of 1,000 metres in relation to the mountain. He stated that the microlight was on a southerly heading cap before starting a turn to the right with a bank of about 30° then saw it start to spin with a high nose-down attitude. He indicated that he had the feeling that the pilot was trying to get out of that situation. After four spins, the microlight collided with trees and then the ground.

2.5.2 Passenger

The passenger, who was sitting in the left seat, indicated that they had taken off autonomously then climber with a succession of turns until the pilot decided to stop the engine and to continue the flight as a glider. He remembered that the glider had suddenly started spinning and that the pilot asked him to pull the emergency parachute handle. He added that he pulled the handle as indicated to him during the pre-flight briefing but noticed that his action was ineffective.

2.5.3 Testimony from other pilots on flying the Pipistrel Taurus microlight

A Taurus pilot indicated that the pitch trim is free during takeoff then tight in flight, in general at a speed of 90 to 95 km/h. He stated that occupants' weight influenced the flying qualities significantly. If this weight was greater than 140 kg, it required that the pitch trim be adjusted to pitch-up[(2)]. He added that at low speed, for example when retracting the engine, this adjustment of the pitch trim to pitch-up and the extended flap configuration made the glider relatively unstable.

[(2)]The pilot and passenger together weighed more than 140 kg, requiring setting the pitch trim to pitch-up, this being confirmed by the position of the control on the wreckage.

Another Taurus pilot confirmed that when the engine is in the extended position and stopped, the glider's stability is diminished. He preferred to avoid turbulent zones (high ground, for example) in order to apply the engine retraction procedure.

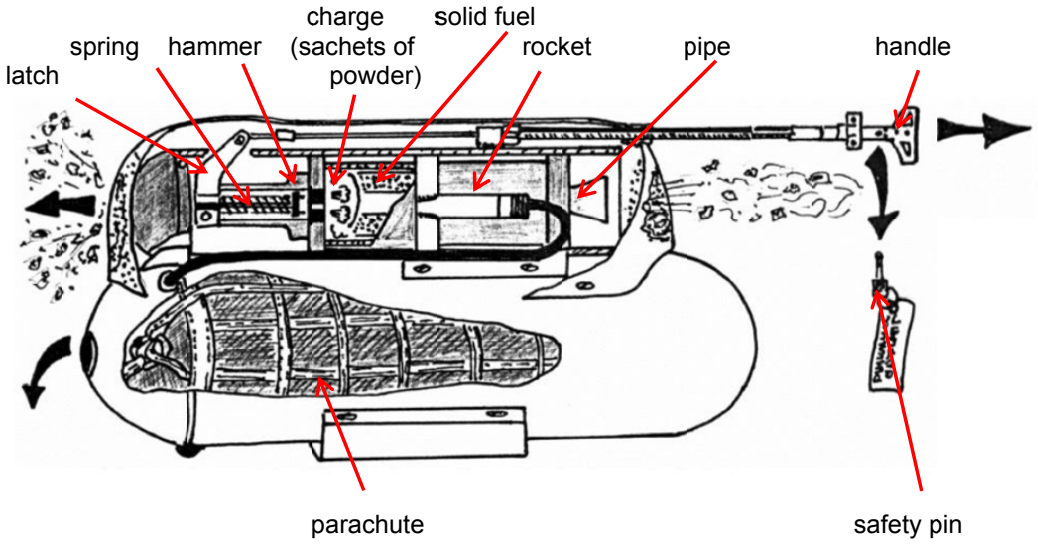
In instruction, during glider autorotation exercises with flaps extended, it is recommended to retract the flaps immediately. The extended flaps configuration leads to an overload on the wing.

2.6 The emergency parachute

The emergency parachute is a Galaxy GRS type. A pyrotechnic system controlled by a handle located at the rear of the cockpit between the two seats, at the level of the canopy, triggers it.

When the handle is pulled, a metal part (called the latch) pivots in order to compress a spring and then release it. The spring projects two hammers onto two charges (sachets of powder). This system ignites solid fuel located in a cylinder, whose ignition causes a rocket to be fired that deploys straps and the parachute, which opens once it is released.

The whole pyrotechnic system is enclosed in a container that is locked with a factory-installed rivet system that is inaccessible to the operator who installs the emergency parachute on an aircraft.



Emergency parachute pyrotechnic system

In November 2013, the emergency parachute installed on 34-ABF had been sent back to the factory for a revision. In March 2014, the pilot had reinstalled the system on his microlight.

Disassembly of the system by deminers confirmed the absence of the two safety devices for transport (pin and screw) and that the mechanisms functions were no longer hindered.

Observations made on the system after the accident confirmed that the passenger had used the system. However, the sachets had not been pierced, a sign of a failure in the percussion mechanism.

Functional tests of the hammer/charge subsystem for the emergency parachute were undertaken with the assistance of the system manufacturer. Each time, the system functioned normally. It was not possible to reproduce the failure of the system seen at the time of the accident. The cause of this failure was not identified. An assembly error during the re-assembly of this system in the factory during the revision is one possibility that cannot be eliminated.

3 - LESSONS LEARNED AND CONCLUSION

The accident was caused by the loss of control of the microlight by the pilot while it was operating near high ground at low speed. The full flaps configuration selected by the pilot to retract the engine in a very turbulent area greatly contributed to the instability of the flight and probably made it harder to exit the spin.

The failure of the emergency parachute pyrotechnic system to function meant that physical harm to occupants was not limited.