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INVESTIGATION REPORT

Accident to
1. ICP Savannah VG identified 57YM
2. Buse'Air 150 identified 75WQ
on 1 September 2018
at Valencisse (Loir-et-Cher)

Time	Around 18:30[1]
Operators	Private
Type of flights	Cross-country
Persons on board	1. pilot 2. pilot and passenger
Consequences and damage	1. pilot injured, microlight destroyed 2. microlight substantially damaged

This is a courtesy translation by the BEA of the Final Report on the Safety Investigation published in October 2021. As accurate as the translation may be, the original text in French is the work of reference.

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

Collision in cross-country flight with another microlight, loss of control, collision with the ground

1 - HISTORY OF THE FLIGHT

Note: the following information is principally based on the statements of the pilots of both microlights, the statement of the passenger on board 75WQ and the statement of a person on the ground, as well as on the paths recorded on the mobile phones of the two pilots.

The pilots of the two microlights undertook a return flight together to their air base at Flavacourt (Oise) after spending the day at Blois-Le Breuil (Loir-et-Cher) aerodrome within the context of an aviation gathering. As with the outbound flight performed that morning, they agreed that the pilot of the ICP Savannah VG identified 57YM would follow the Buse'Air 150 identified 75WQ.

The pilots took off separately at around 18:00, then both headed south to fly over a chateau on the banks of the Loire river before flying cross country to their destination. The pilot of 57YM followed 75WQ at the same altitude, i.e. between 1,000 and 1,500 ft, and several hundreds of metres behind. After around 10 flight minutes, he lost sight of 75WQ. He was unable to contact the other pilot by radio and kept on the same heading.

The pilot of 57YM gained altitude. The propeller and the leading edge of the right wing struck the tailplane of 75WQ. The engine of 57YM stopped and the microlight entered a spin to the right. After a loss of altitude of approximately 1,000 ft, the pilot managed to stop the spin. The microlight collided with the ground in the garden of a house.

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In flight, the pilot and the passenger of 75WQ felt the impact. The pilot decided to abort the flight and landed in a field. On the ground, the pilot and the passenger observed that the microlight had been struck by another aircraft.

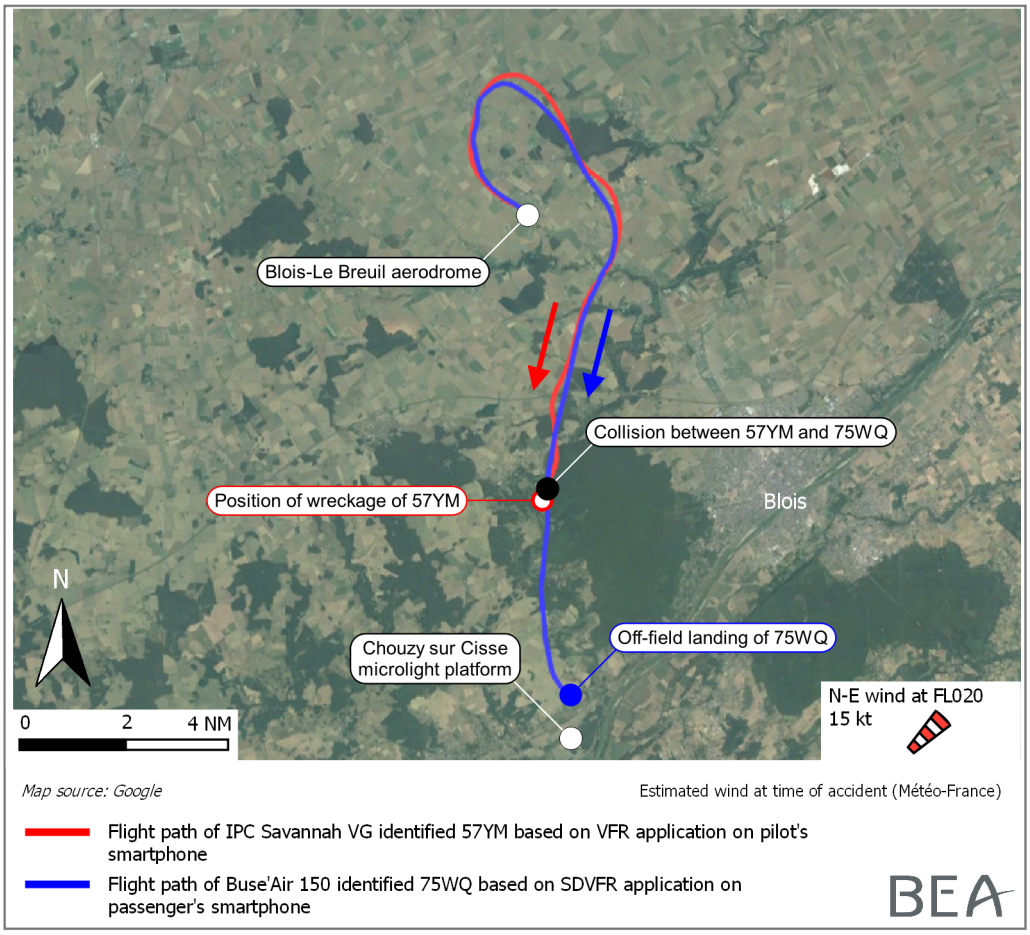

Figure 1: Paths of the two microlights

2 - ADDITIONAL INFORMATION

2.1 Microlight 57YM (Savannah) information

This was a class 3 fixed wing microlight with fixed tricycle landing gear and a strut-braced high-wing. It was constructed entirely of metal. It was not equipped with an anti-collision light or an emergency parachute. Unlike other Savannah type microlights, the upper section of the cockpit was only partially glazed.

2.2 Examinations of site and 57YM wreckage

The microlight hit the ground in right turn. The wreckage was laying flat on the failed landing gear. No fire broke out.

The collision caused the following damage:

- A depression of the leading edge of the right wing tearing the wing's aluminium coating up to the spar (see Figure 2). Traces of red paint were observed at this depression (see Figure 3). This damage corresponds to an interaction with the rudder of 75WQ.
- Damage to the DUC propeller carbon blades from their tips, one of the blades being damaged along almost half of its length (see Figure 4).

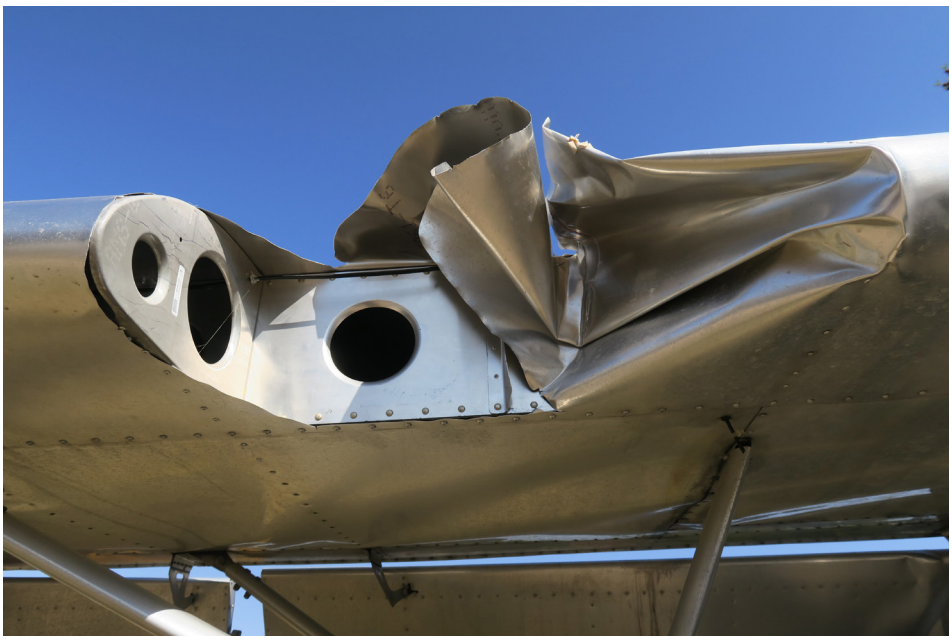

Figure 2: Leading edge of the right wing of 57YM

Figure 3: Detail of depression of the leading edge of the right wing of 57YM and traces of red paint

Figure 4: 57YM propeller

All of the other damage observed resulted from the plane's collision with the ground or the emergency services' operation.

When switching on the Icom IC-A6E type radio, the only radio on board, the frequency displayed was 123.440 MHz on channel 0. The saved frequencies included 123.450 MHz[(2)] on channel 1, 130.200 MHz on channel 2 and 123.500 MHz on channel 3[(3)].

2.3 Microlight 75WQ (Buse'Air) information

This is a class 3 fixed wing microlight with fixed tricycle landing gear and a strut-braced high-wing. The airframe structure is of composite material. On the day of the accident, it was not equipped with an anti-collision light or an emergency parachute.

2.4 Examination of 75WQ

Damage was limited to the left wing tip of the horizontal tailplane and the trailing edge of the rudder. The horizontal plane was damaged by the propeller of 57YM across a width of around 15 centimetres from the wing tip (see Figure 5) and the lower section of the rudder was struck by the leading edge of the right wing of this same aircraft (see Figure 6). The flight controls remained effective and unrestricted in travel. It was not possible to check the active or saved radio frequencies.

(2) Frequency dedicated to air/air operational communications in the absence of contact with air traffic control, in compliance with the order of 28 October 2008 pertaining to the management of civil aviation frequencies, listing ICAO document *"011 - EUR Frequency Management Manual"*.

(3) 130.200 MHz corresponds to the frequency used by organisers for the duration of the Blois-Le Breuil gathering, 123.500 MHz corresponds to the so-called *"A/A"* frequency.

Figure 5: Left stabilizer plane of 75WQ

Figure 6: Rudder and failed fixed tab (metal) of 75WQ

The comparison of the contact areas showed that 57YM struck 75WQ whilst roughly on the same heading, slightly to its left and below it.

2.5 Meteorological and sun position information

The meteorological conditions estimated by Météo-France were a north-easterly wind of 15 kt at FL 020, a visibility greater than 10 km, a clear to slightly cloudy sky and a ground temperature of 23 °C. The aerodromes in the vicinity of Blois were all CAVOK at the time of the accident.

During the collision, the sun was at an azimuth of 259° and 20° above the horizon. Sunset was at 20:35.

2.6 57YM pilot information

The 58-year-old pilot of 57YM obtained his microlight pilot licence in July 2003 along with a class 1 paramotor rating, followed by a class 3 fixed wing rating in August 2011 and a class 4 ultralight gyroplane rating in October 2015.

He stated that he had logged around 100 flight hours in fixed wing microlights, around 40 of which on the Savannah. He had logged around 10 flight hours in the 90 days before the accident and two in the last 30 days, all on his Savannah.

2.7 Statements

2.7.1 57YM pilot's statement

The pilot had purchased this microlight approximately one year earlier. He had already met the pilot of the other microlight but they had never flown together. This was his first ever formation flight.

In the morning, he had met the occupants of the other microlight who had also planned to travel to Blois for the day. They talked before the departure and had agreed to fly to Blois together. Radio exchanges took place over the 123.500 MHz frequency at take-off from Flavacourt, over the 123.450 MHz frequency during the flight with a switch to the Orléans control tower frequency when flying through the Orléans Terminal Manoeuvring Area (TMA), then over the frequency dedicated to the event at Blois. For the duration of this flight, the pilot of 57YM followed 75WQ, which ensured radio contact with the Orléans control tower.

The same communication plan had been agreed for the return flight. They regrouped whilst they were still on the Blois frequency. No exchange took place over the 123.450 MHz frequency before the collision. He stated that they had not agreed the choice of a back-up frequency. After the loss of visual contact, he had looked for the other aircraft for about five minutes, whilst attempting to contact it over the close frequency of 123.440 MHz. Thinking that the other aircraft was lower and that he could see it better by gaining height, he decided to gain altitude. He stated that he had a pair of sunglasses on board but that he had not been wearing them at the time of the accident as he had not been affected by the brightness.

2.7.2 75WQ pilot's statement

The pilot, was the owner of the microlight. He had already made group excursions with other microlights.

He stated that during the morning flight, radio contacts with 57YM had been limited to a few exchanges.

After he felt the impact, he had not visually inspected his side of the microlight. He thought that his propeller had struck something and had reduced the power. Although he knew that there were two microlight strips nearby, he had preferred to abort the flight as quickly as possible.

2.8 Regulatory framework of formation flights

The rules governing formation flying applicable to users of the air space and to general air traffic aircraft are defined in the regulation establishing the rules of the air[4]. This text states that formation flights are only performed upon agreement between the pilot captains of each aircraft in the formation. It does not specify the minimum (vertical and horizontal) distances between each aircraft in the formation, these being the responsibility of the formation leader and the participating pilot captains.

[4] European Commission Regulation No. 923/2012 *"Standardised European Rules of the Air"* (SERA). SERA.3135 - Formation flights. This regulation, implemented by France, has no national supplement.

3 - CONCLUSIONS

The conclusions are solely based on the information which came to the knowledge of the BEA during the investigation. They are not intended to apportion blame or liability.

Scenario

The pilot of 57YM lost visual contact with 75WQ that he was following during a cross-country flight that they were performing together. He was unable to make radio contact with the latter. Both aircraft stayed on paths with very similar altitudes, headings and speeds. In climb, the propeller and leading edge of the right wing of 57YM struck the tailplane of 75WQ. The collision caused 57YM, which was not equipped with a parachute, to enter a spin. The pilot managed to come out of the spin but was unable to avoid collision with the ground.

The investigation was unable to determine if and when the pilots of both microlights selected a common radio frequency between the time of their regrouping and the mid-air collision.

Contributing factors

The following factors may have contributed to the loss of visual and radio contact, then to the mid-air collision:

- The lack of formation flying experience of the pilot of 57YM.
- Insufficient formalizing of the formation flight on the part of both pilots, both during its preparation and in its performance. In particular, they had not established a strategy in the event of loss of visual and/or radio contact between the two aircraft. Also, they did not check that radio contact was established between them when they regrouped, particularly after the planned change in frequency.
- The relative positions of the sun and 75WQ just before the collision that may have hindered the detection of 75WQ by the pilot of 57YM.

Safety lessons

In 2019, the BEA published a report on the mid-air collision between the gyroplanes 79EP and 79LH which were making a cross-country flight together[5]. In this report, the BEA listed 13 collisions that had occurred since 2000 when the pilots had decided to fly together. Formation flying constitutes a specific type of operation. The specificities of this type of operation are not covered during pilot or instructor training and are not the subject of any supplementary rating.

More generally, the BEA and other authorities or organisations (refer to the microlight pilot safety memo published by the French Microlight Federation (FFPLUM)[6]) regularly issue reminders of the importance but also the limits of the "see and avoid" principle in VFR flight. Over the last few years, in particular in response to safety investigations following mid-air collisions, different discussions have been initiated regarding the deployment of onboard traffic detection systems, adapted to light aircraft, to be used alongside the "see and avoid" principle (see the FFPLUM's Information Letter[7]).

The onboard conflict detection systems may not be entirely adapted to formation flying in nominal conditions: continuous or frequent activation of the alert, which may lead to the pilot becoming accustomed to the alert or a voluntary inhibition of the system on the pilot's part. However, these systems might be useful in the event of loss of visual contact. Moreover, among the points to be considered in favour of the "see and avoid" principle, listed by the FFPLUM in its safety memo, is the activation of "flashing lights". The installation of anti-collision lights on microlights is not mandatory. However, an increasing number are equipped and different kits, which can be adapted to many microlight models, are now available on the market. This equipment would probably have helped the pilot of 57YM maintain visual contact with, and subsequently detect, 75WQ.

[5] https://www.bea.aero/fileadmin/uploads/tx_elydbrapports/BEA2018-0535.pdf

[6] https://ffplum.fr/images/pdf/memo-securite-v5.pdf

[7] https://ffplum.fr/securite/comment-mieux-voir-et-etre-vu