

**DATA SUMMARY**

**LOCATION**

Date and time	<b>Saturday, 20 July 2013; 19:48 h<sup>1</sup></b>
Site	<b>Vicinity of Foz (Lugo, Spain)</b>

**AIRCRAFT**

Registration	<b>EC-GF8</b>
Type and model	<b>PIPISTREL SINUS 912</b>
Operator	<b>Private</b>

**Engines**

Type and model	<b>ROTAX 912 UL</b>
Serial number	<b>4408837</b>

**CREW**

**Pilot in command**

Age	<b>52 years old</b>
Licence	<b>Glider Pilot (GPL) and ULM Pilot (TULM)</b>
Total flight hours	<b>185 h on a glider and 52:35 h on ULM</b>
Flight hours on the type	<b>41:35 h</b>

**INJURIES**

	Fatal	Serious	Minor/None
Crew			<b>1</b>
Passengers			<b>1</b>
Third persons			

**DAMAGE**

Aircraft	<b>Destroyed</b>
Third parties	<b>None</b>

**FLIGHT DATA**

Operation	<b>General aviation – Private</b>
Phase of flight	<b>En route</b>

**REPORT**

Date of approval	<b>27 November 2013</b>
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<sup>1</sup> All times in this report are local. To obtain UTC, subtract two hours from local time.

## 1. FACTUAL INFORMATION

### 1.1. History of the flight

The PIPISTREL SINUS 912 aircraft, registration EC-GF8, arrived on the morning of Saturday, 20 July 2013, at the Villaframil Aerodrome (LEVF), located in the municipality of Ribadeo (Lugo, Spain), from the airfield in Alcazarén, located in the municipality of Alcazarén (Valladolid, Spain), with two occupants onboard. Weather conditions at the Villaframil Aerodrome were changing, with periods of fog.

According to the information provided by the pilot, they carried out several local flights in the morning and, as they were preparing to leave the aerodrome, a thick fog rolled in, as a result of which they decided to stay.



In the afternoon, another aircraft took off, the pilot of which reported clear areas over Foz (Lugo, Spain). In light of this information, they decided to carry out a local flight to evaluate the situation in preparation for returning to the airfield in Alcazarén.

Once airborne, they saw a clear area and headed for it. As they were about to clear the clouds, they were surrounded by a thick fog that disoriented the pilot. By the time they exited the cloud layer, which was located at an altitude of about 900 m, the aircraft was in an uncontrolled spin.

In these circumstances, the pilot decided to deploy the emergency parachute outfitted on the aircraft. When it opened, the aircraft experienced a structural failure that caused both wings and the tail to detach. The cockpit, suspended from the canopy, fell to the ground, with the two occupants inside, who suffered slight bruises.

### 1.2. Personnel information

The pilot had an Ultralight Pilot's License issued in Spain on 29/03/2011 and valid until 27/03/2014, and a class 1 Medical Certificate valid until 05/03/2014.



He also had a Glider Pilot's Permit issued in Spain on 10/07/1987. The corresponding license had expired on 11/08/2009 and had not been renewed since.

### 1.3. Aircraft information

The PIPISTREL SINUS aircraft is a high-wing ultralight motor glider made entirely from composite materials. It has a wingspan of 14.97 m and it is 6.6 m long and 1.7 m high. It has a wing surface area of 12.26 m<sup>2</sup>. In its original version its landing gear is in a conventional configuration, with a tail skid. A new version introduced later features a tricycle landing gear with a nose leg. The accident aircraft had this latter configuration. The 912 model is equipped with an 80-HP Rotax 912 UL engine.

This type of aircraft was approved in Spain by the DGAC (Civil Aviation General Directorate) on 22/06/2007. It is covered by AESA (National Aviation Safety Agency) Type Airworthiness Certificate no. 290-I/1, revision no. 3, which was approved on 14/03/2012.

The PIPISTREL SINUS aircraft with registration EC-GF8 and serial number 253SN9120108 had been manufactured in 2008 and it had a maximum authorized weight of 450 kg. It had a ROTAX 912 UL engine installed with serial number 4408837.

The aircraft had a Special Restricted Airworthiness Certificate no. 1403 dated 06/10/2011. With regard to its validity, on the back of said certificate it states:

Based on the M.O. (Ministry Order) of 14 November 1988, this certificate shall be valid for as long as the specifications contained in the Type Airworthiness Certificate referenced in Section 5 of this Certificate apply.

The owner shall be responsible for maintaining and preserving airworthiness conditions.

The National Aviation Safety Agency reserves the right to inspect the status of the aircraft to verify its airworthiness conditions as it sees fit.

At the time of the accident, the aircraft had approximately 110 total hours, the engine had three total hours less, since the aircraft had been operated as a glider during those hours, and both had 20 h since the last 100-h inspection, carried out in June 2013.

#### 1.3.1. Parachute rescue system

The aircraft was equipped with a Galaxy Rocket System (GRS) parachute rescue system, located behind the cockpit. The system consists of a parachute, components to attach it to the aircraft's fuselage, a deployment rocket and an activation handle located in the top part of the cockpit's aft panel.

The system is actuated by pulling the activation handle forward. This launches the rocket upward, which deploys the parachute. A properly functioning parachute will deploy a distance of 15 to 18 m in 0.4 to 0.7 seconds and be fully inflated 3.2 seconds after actuation.

### 1.3.2. *Flight Manual. Use of the parachute rescue system*

The aircraft's Flight and Maintenance Manual has an appendix that, among other things, includes directions for the use, operation and maintenance of the parachute rescue system. The instructions for using the system state:

#### **Use of parachute rescue system**

In situations such as:

- Structural failure.
- Mid-air collision.
- Loss of control over aircraft.
- Engine failure over hostile terrain.
- Pilot incapacitation (incl. heart attack, stroke, temp. blindness, disorientation...).

**The parachute MUST be deployed. Prior to firing the system:**

- Shut down the engine and set master switch to OFF (key in full left position).
- Shut both fuel valves.
- Fasten safety harnesses tightly.
- Protect your face and body.

**To deploy the parachute jerk the activation handle hard a length of at least 30 cm towards the instrument panel.**

Once you have pulled the handle and the rocket is deployed, it will be less than two seconds before you feel the impact produced by two forces. The first force is produced by stretching of all the system. The force follows after the inflation of the canopy from opening impact and it will seem to you that the aircraft is pulled backwards briefly. The airspeed is reduced instantly and the aircraft now starts to descend to the ground underneath the canopy.

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## 1.4. **Meteorological information**

The area where the accident took place, in the vicinity of Foz, is about 15 km away from the aerodrome of Villaframil, where there is an automatic weather station. In

addition, the Asturias and A Coruña airports are 85 km east and 100 km west of the aerodrome, respectively.

According to information supplied by the AEMET (National Weather Service), the overall situation between 11:00 and 20:00 on 20/07/2013 was one of thermal low pressure over the Iberian Peninsula, with low-level high-pressure areas to the west and north of the peninsula. At high levels, there was instability to the north and northeast of the peninsula, with afternoon storms forming over the peninsula.

The forecast for coastal areas in the province of Lugo called for low clouds with mist and fog, improving temporarily at midday, with weak, variable winds predominantly from the west. The low-level significant weather prognostic chart called for fog and low clouds on the Lugo coast between 05:00 and 11:00, and low clouds for the rest of the day.

The satellite images show low clouds over the Cantabrian coast from A Coruña to the vicinity of Cape Peñas in Asturias, with daytime oscillations, with the area affected diminishing during the midday hours. Areas near Foz were not affected by storms or by precipitation.

Weather and climate conditions at the A Coruña and Asturias airports are very similar, since both are very close to the sea. The general conditions conducive to the formation of low clouds (with the associated mist and fog) that were present on that day are typical in the area, especially in early summer, with an area of clouds forming from the north of the province of A Coruña eastward, sometimes as far as the province of Cantabria.

The A Coruña and Asturias METAR reports for that day reflect that situation with changing visibilities and cloud ceilings. Fog reduced visibility at the Asturias Airport to as little as 300 m between 19:00 and 20:00, while low clouds and fog banks prevailed in the vicinity of the airport the rest of the day. At the A Coruña Airport on 20 July 2013, fog banks reduced visibility to 1,000 m between 11:00 and 20:00, and low clouds prevailed throughout the day, with the cloud ceiling and visibility improving during midday hours. Conditions in the area of Foz were most likely very similar.

As for the conditions recorded by the automatic station in Villaframil, the most significant factor was the presence of weak northwesterly winds throughout the day that pushed a mass of humid, almost saturated air, with a relative humidity of over 90% the entire day and over 95% from 16:00 to 20:00.

## **2. ANALYSIS**

On the afternoon of 20 July 2013, the aircraft took off from the Villaframil Aerodrome with two occupants onboard to make a local flight for the purpose of evaluating the weather conditions in preparation for returning to the airfield in Alcazarén, from where it had departed that same morning.

Once airborne, the aircraft's occupants saw a clear area and headed for it. As they were about to clear the clouds, they were surrounded by a thick fog that disoriented the pilot. By the time they exited the cloud layer, which was located at an altitude of about 900 meters, the aircraft was in an uncontrolled spin.

Weather conditions throughout the day in the area of Villaframil had been characterized by the presence of low clouds and fog banks, with varying visibility and cloud ceilings. This was caused by the presence of weak northwesterly winds that were pushing a mass of almost saturated humid air.

Considering how the presence of fog is conditioned by the existence of 100% relative humidity, and that at a lower relative humidity saturation conditions are reached at higher altitudes, the cloud ceiling was fairly low for a relative humidity value in excess of 95%, as reflected in the weather reports from nearby areas.

In these circumstances, with the aircraft flying at an altitude near the cloud ceiling, it is likely that during the flight, saturation conditions existed at altitudes below the flight level, with the consequent drop in the cloud ceiling causing them to suddenly find themselves in the cloud layer.

Once they were surrounded by clouds, the aircraft's pilot lost all external visual references, became disoriented and lost control. By the time he regained the external references, the aircraft was in an attitude from which the pilot could not recover, so he decided to open the emergency parachute. It should be noted that this is one of the situations described in the aircraft's Flight and Maintenance Manual for its use.

During the parachute's deployment, the aircraft was subjected to the two forces described in 1.3.2, as the nearly instantaneous reduction in the aircraft's speed subjected the structure to loads in excess of design forces. This caused the frame to fracture, with the two wings and the tail detaching. The cockpit fell to the ground suspended from the parachute, which had performed as intended.

### **3. CONCLUSIONS**

The accident took place when the pilot lost control of the aircraft and actuated its emergency parachute, which caused the aircraft's structure to fail in flight.

This happened as a result of flying the aircraft near the cloud ceiling in atmospheric conditions of nearly saturated relative humidity. When the aircraft was suddenly enveloped in clouds, the pilot lost all external visual references and became disoriented.