DATA SUMMARY

LOCATION

Date and time	**Tuesday, 12 October 2010; 12:17 local time[1]**
Site	**Monte Alkurruntz, valle de Baztán (Navarre)**

AIRCRAFT

Registration	**F-GJLM**
Type and model	**PIERRE ROBIN DR 400-180**
Operator	**Private**

Engines

Type and model	**LYCOMING O-360-A**
Number	**1**

CREW

Pilot in command

Age	**70 years old**
Licence	**Private pilot license (A)**
Total flight hours	**618 h**
Flight hours on the type	**618 h**

INJURIES

	Fatal	Serious	Minor/None
Crew	**1**		
Passengers	**2**		
Third persons			

DAMAGE

Aircraft	**Destroyed**
Third parties	**None**

FLIGHT DATA

Operation	**General Aviation – Private**
Phase of flight	**En route**

REPORT

Date of approval	**25 January 2012**

[1] All times in this report are local unless otherwise specified.

1. FACTUAL INFORMATION

1.1. History of the flight

The Robin DR400-180 aircraft, registration F-GJLM, took off on Tuesday, 12 October 2010, at 10:36 h with three persons onboard from the Lezignan-Corbieres Airport in the south of France. It was taking part along with 11 other aircraft in a 18-day long benefit air race, the Raid Latecoere, the final destination of which was the Saint-Louis Airport in Senegal.

The aircraft had arrived at the departure aerodrome on Thursday, 7 October. The race was to have started on Saturday morning, and the plan was to cross the peninsula via the east coast (Valencia, Almeria and Gibraltar). The departure had to be delayed due to the weather. On Monday, 11 October, the weather forecast along the initial route continued to be bad, but the forecast for the west was more favorable, so all of the participants decided to reroute the race north of the Pyrenees to Biarritz and the San Sebastian (LESO) Airport, where they would refuel and continue the journey to the Salamanca Airport (LESA).

In keeping with this new plan, on Tuesday, 12 October, all of the aircraft departed, with aircraft F-GJLM taking off in the sixth position. The race organizer took off first, as he himself stated, and after verifying that the weather at Biarritz made landing there possible, instructed the other aircraft to start the journey. All of the aircraft were equipped with a satellite tracking system (GPS). Figure 1 shows the flight paths obtained from this system. The accident aircraft was flying practically on a westerly heading toward the Biarritz VOR/DME until, at 12:00 h, instead of continuing to San Sebastian to the southwest like the other aircraft, it turned south and headed for the Pyrenees.

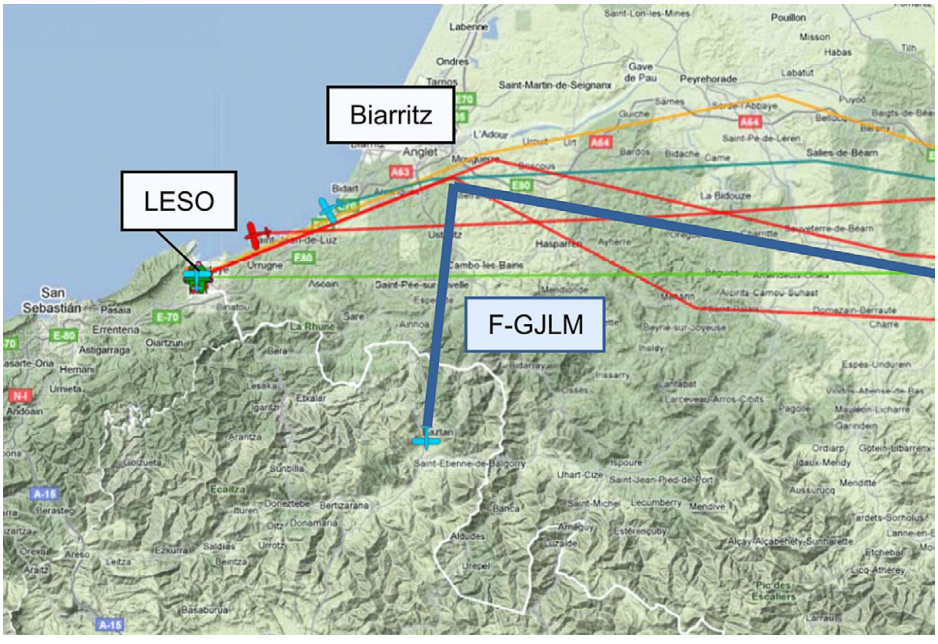

Figure 1. Race route: flight paths of other aircraft in the race and of F-GJLM

The aircraft flew south for 11 minutes to the locality of Elizondo. It then turned north and, at 12:17 h, impacted the northeast face of Alkurruntz Mountain, at an elevation of 1,710 ft. The wreckage was found at 12:44 h by three individuals who were passing through the area.

The aircraft was completely destroyed. The autopsy revealed that the three occupants died as a result of multiple trauma produced by the impact.

1.2. Personnel information

The three persons onboard were all pilots and had private pilot licenses. None was rated for instrument flight. They were 77, 70 and 58 years old.

Based on the information contained in the flight plan, the pilot was to have been the 77-year old occupant, though, as the investigation later revealed, a photograph taken before takeoff showed that the person seated in the pilot's seat was the 70-year old occupant. This information was corroborated by an entry in a notebook found at the accident site that indicated that the pilot was the 70-year old occupant.

The log books for each of the occupants indicated the following experience:

Occupant (age)	Flight hours		
	Dual control	Pilot flying	Total
70 (pilot)	166	452	618
77	134	707	841
58	54	660	714

Table 1. Experience of the persons onboard

The entries in the flight log of the pilot flying indicate that he had routinely flown on this aircraft. The last flight, three weeks prior, had lasted one hour and he had flown 11 hours in the last three months.

1.3. Aircraft information

At the time of the accident, the aircraft had 3,757 h and the engine 5,160 total hours. It had flown 80 hours in the last year and had undergone the following inspections:

- 05/10/2010: 50-hour inspection with 3,754 aircraft hours.
- 08/07/2010: 500-hour inspection with 3,724 aircraft hours.
- 24/10/2009: 50-hour inspection with 3,673 aircraft hours.

1.4. Meteorological information

The individuals who discovered the aircraft stated that there was dense fog at the accident site and the visibility was below 20 m. The Civil Guard and Regional Police Forces that reached the accident site at around 13:00 h stated that there was a dense fog. The 13:00 METEOSAT image shows the sky over the Baztán valley was covered by low clouds.

1.5. Aids to navigation

Figure 2 shows the aircraft's radar echo over the final 17 minutes of the flight.

At 12:00 h, the aircraft changed course to the south after reaching Biarritz. It followed road N121B to the town of Elizondo, which it reached at 12:11 h. From then on, the aircraft headed back to the north. It followed road N121B for two minutes, made a full turn, advanced to the north and then started another turn. It was during this turn that the impact occurred.

12:00-12:10	South heading along road N121B 2,200 ft altitude
12:10-12:11	Start of turn to change course from south to north. Climb and descent: 2,200-2,700-1,700 ft.
12:11	Flies over Elizondo at 1,700 ft.

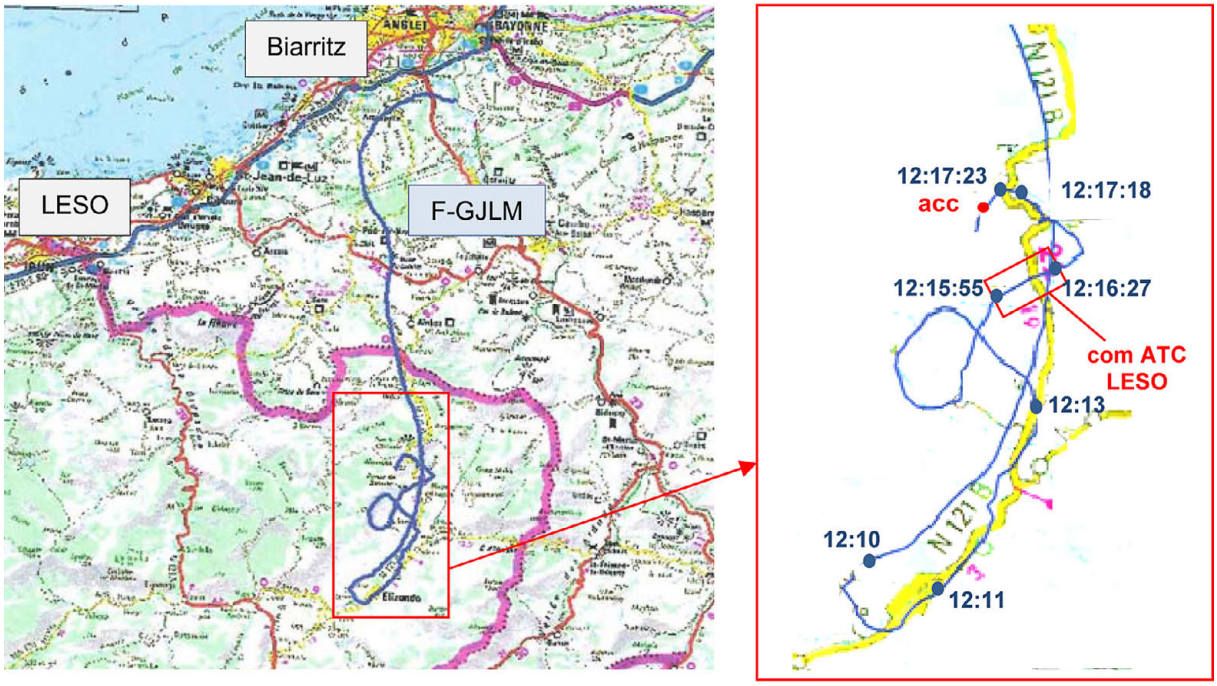

Figure 2. Radar flight path of final 17 minutes of flight

12:11-12:13	North heading along road N121B. Climb from 1,700 to 2,200 ft.
12:13-12:15:55	Full turn. Climb from 2,200 to 3,500 ft
12:15:55-12:16:27	Northeasterly heading and descent from 3,500 to 3,200 ft. 1st exchange with LESO TWR: 3,500 ft and 100 kt. 2nd exchange with LESO TWR: 3,400 ft and 100 kt. 3rd exchange with LESO TWR: 3,300 ft and 120 kt.
12:16:27-12:17:18	Northwesterly heading.
12:17:23	2,200 ft and 140 kt airspeed.
12:17:23-12:17:28	Southerly heading and descent from 2,200 to 2,000 ft.
12:17:28	Last confirmed radar echo: altitude 2,000 ft and 140 kt.

The last radar returns are consistent with the area in which the wreckage was found, as well as with the aircraft's heading at the time of impact, though the last radar echo received by ATC was at 12:17:35 h from a position slightly south of Alkurruntz Mountain, and the aircraft was found northeast of this peak. The last return, therefore, was likely calculated by the system and can be ruled out as a valid echo.

1.6. Communications

During the journey the aircraft were in contact with various ATC stations and with each other. The transcript of the ATC communications with the San Sebastian control tower (Table 2) shows that the aircraft transmitted three messages to ATC, the first two in French and the last in English during the segment shown in Figure 2.

Local time	LESO TWR ATC	F-GJLM
12:15:55		San Sebastián FLM bon jour
	FLM confirm?	
		FGJLM DR40, provenance Lezignan-Corbieres, pur aller ver vous
	FGJLM I read you two. Confirm requesting airfield data?	
12:16:27		...Our airfield de depart... (unintelligible)
	FLM I confirm wind calm, visibility more than 10 km, scattered 1500 feet, broken 3000, temperature 16, dew point 14 and QNH 1008. Confirm requesting runway 04 or 22?	
12:17:26	FGJLM on frequency?	
	FGJLM?	

Table 2. Communications with LESO control tower

When the aircraft failed to reply, the LESO controller contacted ATC Biarritz and the other aircraft on the frequency in an unsuccessful effort to reestablish communications with the aircraft.

According to statements made by two pilots onboard two other aircraft in the race, they heard the aircraft's crew state on the radio that they were in instrument flying conditions (IMC).

1.7. Flight recorders

The aircraft was equipped with three position tracking devices:

- Portable Garmin 92 GPS. Its information was downloaded at the French accident investigation agency (BEA). The accident flight had been recorded on it and the flight path registered matched that displayed on the ATC radar.
- Portable Spot Sierra Eco GPS. Used by race organizers to track the aircraft's position. The flight path recorded on this instrument is shown in Figure 1.
- Garmin 430 GPS integrated into the aircraft. This device was completely destroyed by the impact, which made it impossible to recover any information from it.

1.8. Wreckage and impact information

The aircraft struck the northeast face of Alkurruntz Mountain at an elevation of 1,710 ft. The area was very steep with large elevation differences between the valleys and mountains. The mountains surrounding the impact site are 2,300, 2,800 (Alkurruntz) and 3,000 ft high.

The wreckage showed signs of a frontal impact at high speed. The aircraft first struck a tree (Figure 3), which caused it to lose its wings, and then the side of Alkurruntz

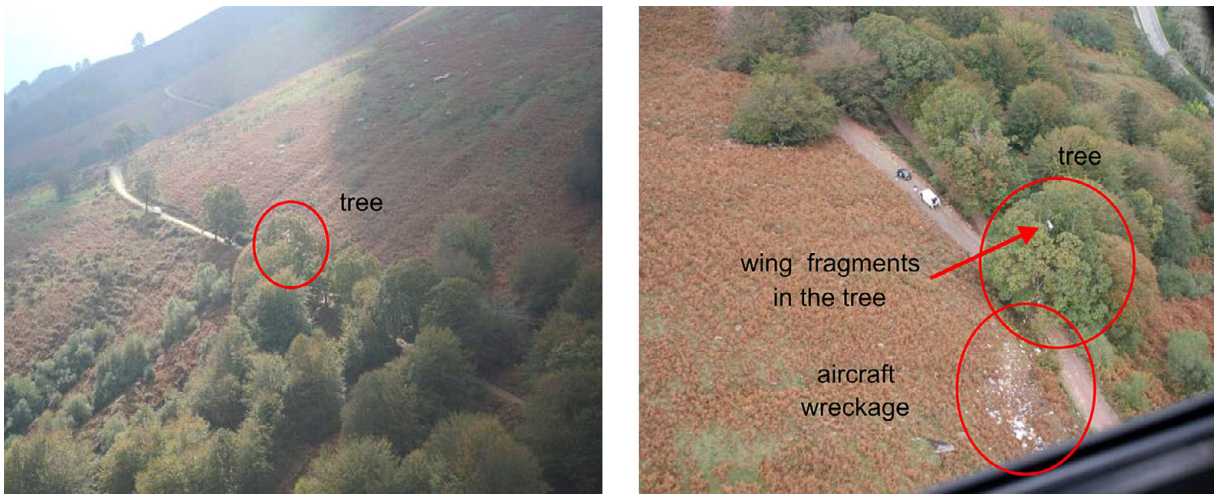

Figure 3. Aerial view in direction of flight (left) and debris field (right)

Mountain. The aircraft, made of wood and fabric, broke into small pieces that scattered along the mountainside. The most distant fragments were 68 m away from the tree. The bodies of the passengers and the pilot were between 51 and 68 m away, the propeller was 47 m away and the empennage was 27 m away. The fabric from one of the wings was hanging from a tree and fragments from the other wing were found on the ground.

The way in which some of the tree branches had been cut indicates that they were cut by the propeller. Other branches had been torn off and dragged and were found on the ground.

The propeller remained attached to the front of the engine crankshaft, which had fractured in a way indicative of an overloading bending stress. This means that the engine was under power at the moment of impact. The engine did not exhibit any signs of having failed prior to impact.

The anemometer needles froze on impact and indicated 130 kt.

2. ANALYSIS

2.1. Analysis of impact

The impact took place at power and at high speed, on a course toward the line of mountains that includes Alkurruntz. There was heavy fog at the accident site that persisted until one hour after the accident, meaning that the last phase of the aircraft's flight took place in instrument meteorological conditions. The presence of fog made the crew unaware that they were heading toward the mountain.

The flight profile over the final 17 minutes of the flight, once the aircraft had already entered the Pyrenees, suggests that the crew was unaware of being in the wrong location until 12:10 h. Until 12:13 h, the path followed by the aircraft exactly matched that of road N121B, meaning that visual meteorological conditions must have existed until then. The change in course to the north along the same road, the turns and the climbs to 3,500 and 3,700 ft to gain altitude are part of the maneuvers recommended for a lost aircraft that is attempting to return to a recognizable point along its planned route.

The final radar echoes before impact show a sharp descent over a very short time, during which the aircraft's speed rose to 140 kt. This descent took place in a foggy area and was probably made in an effort to find a low area with good visibility. The impact took place at an altitude of 1,710 ft and 130 kt. The last valid radar return showed the aircraft at an altitude of 2,000 ft and a speed of 140 kt.

The three transmissions the aircraft made to the LESO control tower took place over a span of 32 seconds. The last transmission was made approximately one minute before

impact. The crew did not declare an emergency or report its position or the situation they were in.

The investigation has ruled out any problem involving the operation of the aircraft, the fuel or the engine.

2.2. Analysis of the deviation from the planned flight path

The aircraft deviated in Biarritz toward the south instead of heading southwest, like the other aircraft. Investigators were unable to ascertain why the crew flew into the Pyrenees.

Extending the accident aircraft's flight path to the south leads to Pamplona. A likely option, then, is that the crew entered the coordinates for one of the Pamplona navaids by mistake and were heading toward it. The instrument into which they would have entered the navigation waypoints is the aircraft's Garmin 430 GPS unit, but it was destroyed by the impact, meaning no information could be retrieved from it. As a result, this hypothesis, which is considered the most likely, could not be confirmed.

3. CONCLUSIONS

3.1. Findings

- The route initially planned was modified the day before the accident due to weather conditions.
- The private pilots onboard had experience mainly in visual flying conditions.
- None of the occupants had an instrument rating.
- The aircraft deviated from its expected flight path 17 minutes before the accident and flew into the Pyrenees.
- The weather conditions transitioned from visual to instrument due to the presence of fog at the accident site.
- The accident took place at high speed and with the engine at power.
- The accident did not occur because of problems with the functioning of the aircraft or the engine.

3.2. Causes

Aircraft F-GJLM impacted the side of Alkurruntz Mountain due to the appearance of fog and the ensuing change in flying conditions, which went from visual to instrument. At the time of the accident the aircraft was flying in an unexpected area due to the wrong course having been input 17 minutes before the accident.