

# Technical report

## ULM A-029/2022

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Accident on 01 October 2022 involving a RANS COYOTE II S 6ES VF EC912 aircraft, registration 32GX, in the municipality of El Álamo (Madrid).

Please note that this report is not presented in its final layout and therefore it could include minor errors or need type corrections, but not related to its content. The final layout with its NIPO included (Identification Number for Official Publications) will substitute the present report when available.



## **Notice**

This report is a technical document that reflects the point of view of the Civil Aviation Accident and Incident Investigation Commission regarding the circumstances of the accident that is the object of the investigation, its probable causes, and its consequences.

In accordance with the provisions of Article 5.4.1 of Annex 13 of the International Civil Aviation Convention, Article 5.5 of Regulation (EU) No. 996/2010 of the European Parliament and of the Council of 20 October 2010, Article 15 of Law 21/2003 on Air Safety, and Articles 1, 4 and 21.2 of RD 389/1998, this investigation is exclusively of a technical nature and its objective is the prevention of future aviation accidents and incidents by issuing, if necessary, safety recommendations to prevent their recurrence. The investigation is not intended to attribute any blame or liability, nor to prejudge any decisions that may be taken by the judicial authorities. Therefore, and according to the laws specified above, the investigation was carried out using procedures not necessarily subject to the guarantees and rights by which evidence should be governed in a judicial process.

Consequently, the use of this report for any purpose other than the prevention of future accidents may lead to erroneous conclusions or interpretations.

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## Abbreviations

°C	Degrees Celsius
AEMET	State Meteorological Agency
ANAC	Portuguese Civil Aviation Authority
CIAIAC	Civil Aviation Accident and Incident Investigation Commission
CV	Horsepower
dgac	French Directorate-General for Civil Aviation
h	Hours
kg	Kilograms
km	Kilometres
kt	Knots
LEBA	Casarrubios del Monte Aerodrome
LT	Local time
m	Metres
MAF	Multi-axis fixed-wing
ULM	Ultralight motorised aircraft
VFR	Visual flight rules

## Synopsis

<b>Operator:</b>	Private
<b>Aircraft:</b>	RANS COYOTE II S 6ES VF EC 912, registration 32GX
<b>Date and time of the accident:</b>	01/October/2022, 12:27 LT
<b>Site of the accident:</b>	Municipality of El Álamo (Madrid)
<b>Persons on board:</b>	1, unharmed
<b>Type of flight:</b>	General aviation - Private
<b>Flight rules:</b>	VFR
<b>Phase of flight:</b>	En route – climbing to cruise level
<b>Date of approval:</b>	29 March 2023

### Summary of the incident:

On Saturday, 01 October 2022, the RANS COYOTE II S 6ES VF EC 912 aircraft, registration 32GX, suffered an accident during a flight bound for the runway<sup>1</sup> at Praia Verde (Monte Gordo-Castro Marim, Portugal).

The aircraft, which was taking part in an aerial tour ending in Africa, had taken off from Casarrubios del Monte (LEMT) Aerodrome and was bound for the Praia Verde runway in Monte Gordo-Castro Marim (Portugal). The pilot was the only occupant on board.

During the climb phase, shortly after take-off, the pilot noticed an electrical failure. At that moment, the engine cut out, forcing him to conduct an off-airfield landing in an agricultural field.

The pilot was unhurt, but the aircraft sustained significant damage.

The investigation has concluded that the cause of the accident was the performance of an off-airfield emergency landing due to an electrical fault in the aircraft and a subsequent loss of engine power.

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<sup>1</sup> Runway approved by the ANAC for use by ultralight aircraft

## **1. FACTUAL INFORMATION**

### **1.1. History of the flight**

On Saturday, 01 October 2022, the RANS COYOTE II S 6ES VF EC 912 aircraft, registration 32GX, took off from Casarrubios del Monte Aerodrome, intending to fly to a runway located in Praia Verde (Monte Gordo, Portugal), with only the pilot on board.

Along with four other aircraft, it was taking part in an aerial tour from France to Senegal.

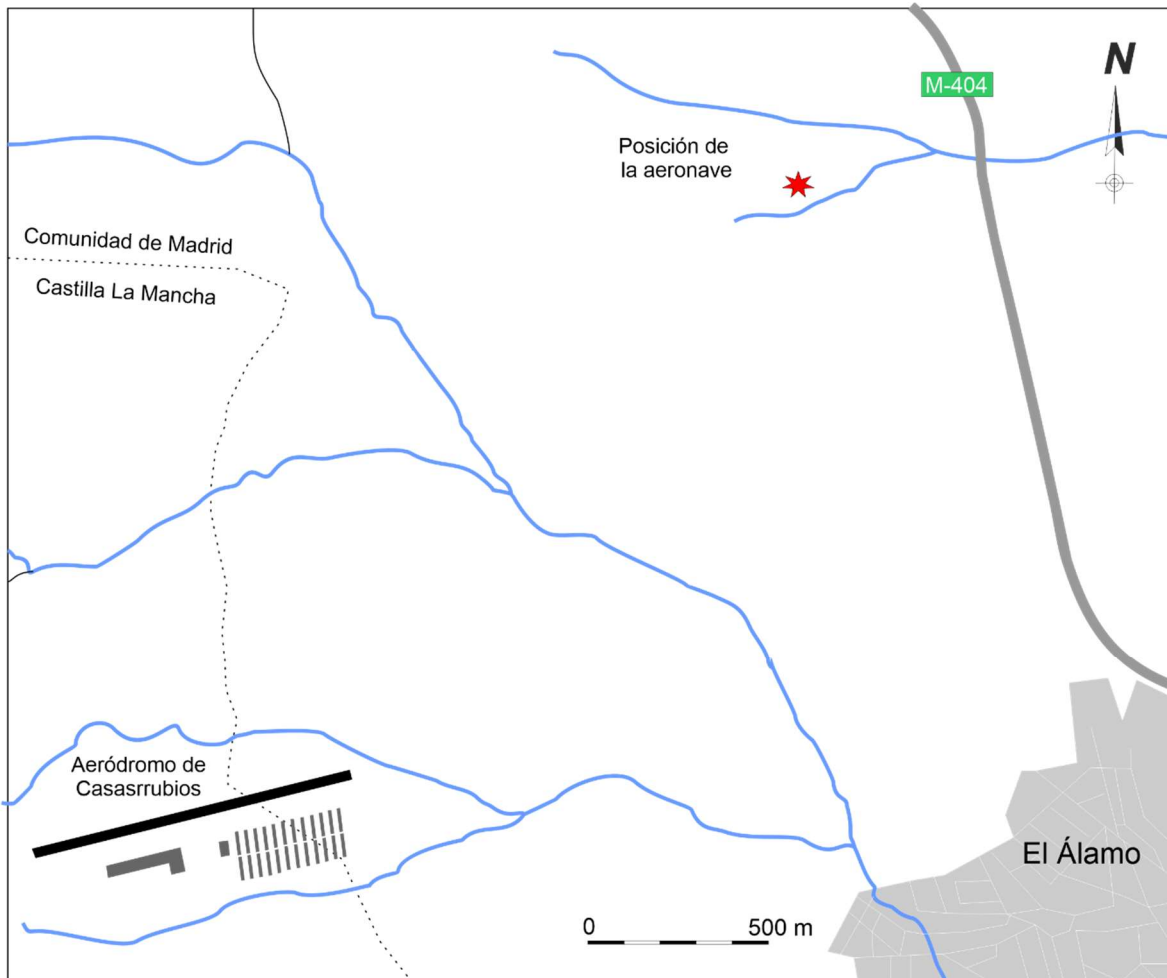
They had flown the first stage of the tour from the airfield at Mimizan (Landes-France) to Garray (Soria-Spain) the day before. On Saturday the 1st, the aircraft took off to complete the second stage between Garray and Monte Gordo in the south of Portugal, landing mid-morning at Casarrubios del Monte (Toledo) Aerodrome to refuel.

After refuelling, the aircraft took off again to fly the second half of the stage. According to the pilot, shortly after this take-off, at the start of the flight and while still climbing, the aircraft experienced a total power failure and an engine shutdown almost simultaneously.

The pilot immediately decided to head back towards the airfield but, on realising he wouldn't reach it, was forced to carry out an emergency landing on one of the fields within range.

After touching down, the aircraft taxied over the terrain smoothly until it crossed a small raised ridge, at which point the right main landing gear leg collapsed, and it then slid along the ground before coming to a complete stop.

The pilot was unhurt, but the aircraft sustained significant damage.



**Fig. no.1. - Sketch showing the location of the aircraft**

### 1.2. Injuries to persons

<i>Injuries</i>	<i>Crew</i>	<i>Passengers</i>	<i>Total in the aircraft</i>	<i>Others</i>
Fatalities				
Serious				
Minor				
Unharmmed	1		1	
TOTAL	1		1	

### **1.3. Damage to the aircraft**

The aircraft sustained significant damage.

### **1.4. Other damages**

N/A.

### **1.5. Information about the personnel**

#### **Information about the aircraft crew**

The 59-year-old pilot had an Ultralight Pilot Certificate and Licence issued by the French Republic's Direction Générale de l'Aviation Civile (dgac) on 24 June 1991, with a Multi-Axis Fixed Wing Instructor (MAF) rating, valid until 30 April 2024. He also had a Class 2 medical certificate, valid until 13 June 2023.

He had 6,335 hours of flight, of which 1,350 hours were in type.

### **1.6. Information about the aircraft**

The aircraft was a RANS COYOTE II motorised ultralight, model S 6ES VF EC 912, with a maximum take-off weight of 450 kg. The serial number of the aircraft involved in the accident is 1193557. It is equipped with a Rotax 912 S 100 hp injection engine.

It had an "*Accuse de reception de la declaration d'aptitude au vol d'un ULM*" issued by the Direction Générale de l'Aviation Civile (dgac) on 12 April 2021, valid until 11 April 2023.

It also had a Declaration to operate in Spain with ULM registered in other State between 09/01/2022 and 12/31/2022.

According to the pilot, prior to the start of the flight, the aircraft had undergone a general overhaul, including a 25-hour engine overhaul, which included changing the oil and filters, inspecting the spark plugs, etc.

At the time of the accident, the aircraft had 1,350 hours of flight time.



### **1.7. Meteorological information**

According to the information provided by the State Meteorological Agency (AEMET), there are no observation instruments at the accident site. The most representative meteorological stations for that location are the ones at Arganda del Rey, Villanueva de la Cañada and Toledo, located 43 km to the east, 21 km to the north and 41 km to the south, respectively.

The data recorded shows no precipitation, temperatures between 19 °C and 20 °C, and winds from different directions depending on the station, with speeds of around 1.6 kt and maximum gusts of 8 kt at the Toledo station.

There were no limiting meteorological conditions for the flight.

### **1.8. Aids to navigation**

N/A.

### **1.9. Communications**

N/A

### **1.10. Information about the aerodrome**

N/A

### **1.11. Flight recorders**

The aircraft was not equipped with a conventional flight data recorder or a cockpit voice recorder. The applicable aeronautical regulations do not require the installation of any type of recorder on this type of aircraft.

### **1.12. Aircraft wreckage and impact information**

The wreckage was concentrated in one spot in a harvested cereal field comprising a large area of compact and almost flat land.



***Fig. no. 2 - Aircraft in its final position***

It had come to rest with the lower part of its fuselage, left main gear leg and right-hand wing tip touching the ground.

There were cracks in the right-hand underside of the fuselage and on the end of the right wing, which was also deformed. The right main gear leg was broken and separated from the aircraft.

The tracks on the ground were spread over a length of 36 m. The first section consisted of two lines running parallel to one other up to the intersection with a slight ridge running transversely to the aircraft's direction of travel. The second section consisted of more pronounced marks covering the remaining 9 m to the aircraft's final location.

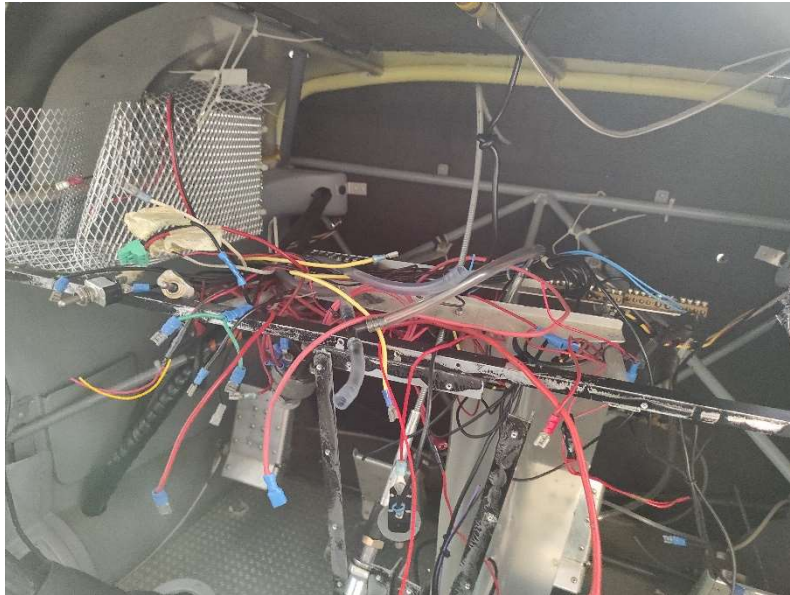


**Fig. no. 3 - Detail of the track marks on the ground**



**Fig. no. 4 - Detail of the track marks on the ridge**

At the time of accessing the wreckage, the aircraft had been disassembled and prepared for transport. The cockpit instruments were removed prior to notifying the CIAIAC of the accident, cutting the relevant electrical circuitry, altering the wreckage and interfering with the investigation.



*Fig. no. 5 - Condition of electrical circuitry inside the aircraft*

During the comment period, the pilot reported a possible internal sulphation problem in the battery connection switch.

**1.13. Medical and pathological information**

There is no evidence of any physiological factors or disabilities that may have affected the pilot's actions.

**1.14. Fire**

No fire broke out.

**1.15. Survival aspects**

The harnesses and restraint systems worked adequately, and the cabin interior maintained its structural integrity.



### **1.16. Tests and research**

Once the wreckage had been moved to a hangar at Casarrubios Aerodrome, the electrical system was inspected, verifying that the battery was in good condition and charged and that the circuit between the battery and the connection point on the engine bulkhead had good continuity.

No further inspections of the condition of the wiring to the various instruments and the starter motor were possible since most of them had been tampered with and removed from the aircraft.

The engine was removed and underwent a detailed inspection in a specialised workshop, which found that it was in good condition and working order.

### **1.17. Organisational and management information**

N/A

### **1.18. Additional information**

N/A

### **1.19. Useful or effective investigation techniques**

N/A

## **2. ANALYSIS**

### **2.1**

### **2.3 Regarding the wreckage**

The layout of the tracks on the ground corresponds, in the first 27 m section, to the main landing gear wheels making contact with the ground during the initial taxi. In the second 9 m section, the marks were made by the fuselage as it dragged along the ground after the right landing gear leg collapsed on hitting the ridge.

According to the results of the engine inspection, it was in good condition and functioning correctly. This finding suggests that its shutdown was possibly a consequence of external factors. However, this could not be confirmed because the wreckage was altered before the inspectors arrived.

Moreover, the pilot's description of a sudden and total electrical failure would be consistent with the above and would explain a malfunction of the engine's injection system and, thus, the engine shutdown. The investigation was unable to verify this situation because although it was able to confirm that the battery and its connection to the point of contact in the engine bulkhead were in good working order, it was unable to carry out a more extensive analysis of the entire electrical system, as the cockpit instruments and their electrical wiring had been removed from the aircraft prior to notifying the CIAIAC of the accident, altering the wreckage and interfering with the investigation.

#### **2.4 Regarding the operation**

According to the pilot's statement and as suggested by the tracks on the ground, the operation, including the touchdown, proceeded normally until the aircraft encountered a ridge while taxiing, which caused the right landing gear leg to collapse.

### **3. CONCLUSIONS**

#### **3.1 Confirmed findings**

There were no limiting meteorological conditions for the flight.  
The engine was in good condition and functioning correctly.  
The cockpit instruments and electrical circuitry had been removed from the aircraft.  
The aircraft touched down and taxied normally for 27m.

#### **3.2 Causes/contributing factors**

The cause of the accident was the performance of an off-airfield emergency landing due to an electrical fault in the aircraft and a subsequent loss of engine power.

### **4. OPERATIONAL SAFETY RECOMMENDATIONS**

None