

CIAIAC

COMISIÓN DE
INVESTIGACIÓN
DE ACCIDENTES
E INCIDENTES DE
AVIACIÓN CIVIL

Report ULM A-014/2018

Accident involving a Flight Design
CTSW aircraft, registration EC-EV5, in
the aerodrome of Algodor (Madrid) on
3 July 2018.



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DE ESPAÑA

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SUBSECRETARÍA

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DE ACCIDENTES E INCIDENTES
DE AVIACIÓN CIVIL

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Notice

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

In accordance with the provisions in Article 5.4.1 of Annex 13 of the International Civil Aviation Convention; and with articles 5.5 of Regulation (UE) n° 996/2010, of the European Parliament and the Council, of 20 October 2010; Article 15 of Law 21/2003 on Air Safety and articles 1., 4. and 21.2 of Regulation 389/1998, this investigation is exclusively of a technical nature, and its objective is the prevention of future civil aviation accidents and incidents by issuing, if necessary, safety recommendations to prevent from their reoccurrence. The investigation is not pointed to establish blame or liability whatsoever, and it's not prejudging the possible decision taken by the judicial authorities. Therefore, and according to above norms and regulations, the investigation was carried out using procedures not necessarily subject to the guarantees and rights usually used for the evidences in a judicial process.

Consequently, any use of this report for purposes other than that of preventing future accidents may lead to erroneous conclusions or interpretations.

This report was originally issued in Spanish. This English translation is provided for information purposes only.

Contents

- ABBREVIATIONS..... v
- SYNOPSIS vi
- 1. FACTUAL INFORMATION..... 1
 - 1.1. History of the flight..... 1
 - 1.2. Injuries to persons..... 2
 - 1.3. Damage to aircraft..... 2
 - 1.4. Other damage..... 2
 - 1.5. Personnel information..... 2
 - 1.6. Aircraft information 2
 - 1.6.1 General information..... 2
 - 1.7. Meteorological information..... 3
 - 1.8. Aids to navigation 4
 - 1.9. Communications..... 4
 - 1.10. Aerodrome information 4
 - 1.11. Flight recorders 4
 - 1.12. Wreckage and impact information 4
 - 1.13. Medical and pathological information 6
 - 1.14. Fire 6
 - 1.15. Survival aspects..... 6
 - 1.16. Tests and research 6
 - 1.16.1. Interview with the pilot 6
 - 1.17. Organizational and management information 7
 - 1.18. Additional information..... 7
 - 1.19. Useful or effective investigation techniques..... 7
- 2. ANALYSIS..... 8
 - 2.1. General..... 8
 - 2.2. Of the weather conditions..... 8
 - 2.3. Of the operation 8
- 3. CONCLUSIONS 9
 - 3.1. Findings..... 9
 - 3.2. Causes/Contributing factors..... 9
- 4. SAFETY RECOMMENDATIONS..... 10

Abbreviations

°	Sexagesimal degrees
° C	Degrees centigrade
AEMET	National Weather Agency
AESA	National Aviation Safety Agency
HP	Horsepower
ft	Feet
Kg	Kilograms
Km	Kilometers
Km/h	Kilometers per hour
LT	Local time
m	Meters
MAF	Multi-axis fixed wing
s/n	Serial number
TULM	Ultralight pilot license
UTC	Coordinated universal time
VFR	Visual flight rules

Synopsis

Operator:	Private
Aircraft:	Flight Design CTSW, registration EC-EV5
Date and time of accident:	3 July 2018 at 18:15 LT ¹
Site of accident:	Aerodrome of Algodor (Madrid)
Persons on board:	1, uninjured
Type of flight:	General aviation - Private
Flight rules:	VFR
Date of approval:	

Summary of event:

On Tuesday, 3 July 2018, a Flight Design CTSW aircraft, registration EC-EV5, was involved in a runway overrun while landing at the aerodrome of Algodor.

After landing on runway 32 at the aerodrome, the aircraft was unable to stop within the runway limits and veered off the opposite end, flipping over meters later in an adjacent crop field.

The pilot was uninjured, but the aircraft sustained heavy damage.

The investigation has concluded that the accident was caused by an improperly executed approach and landing maneuver.

¹ All times in this report are local unless otherwise specified. On the date of the accident, local time was equal to UTC+2 hours.

1. FACTUAL INFORMATION

1.1. History of the flight

On Tuesday, 3 July 2018 at 17:30 local time, a Flight Design aircraft, registration EC-EV5, took off from the aerodrome of Casarrubios (Toledo) with the intention of going on a flight to practice short-runway landings and takeoffs. The pilot was the sole occupant.

After carrying out an initial landing at the aerodrome of Casarrubios, the pilot flew to the aerodrome of Camarenilla (Toledo), where he landed on runway 23. He then proceeded to the aerodrome of Algodor. After flying the relevant circuit, and one established on final with 15° flaps at a speed of 110 km/h, the aircraft contacted runway 32 over two-thirds of the way down the runway.

After applying the brakes, the aircraft exited the end of the runway and went into the adjacent field, which had recently been plowed. The ground was soft and the furrows were perpendicular to the runway heading. As a result, after traveling about 30 m, the nose gear collapsed, driving the propeller into the ground and causing the aircraft to flip over.



Figure 1. Condition of the aircraft

The pilot later secured the aircraft and exited via the copilot's window. Once outside, he deactivated the ballistic parachute.

The pilot was uninjured but the aircraft was significantly damaged.

1.2. Injuries to persons

Injuries	Crew	Passengers	Total in the aircraft	Others
Fatal				
Serious				
Minor				
None	1		1	
TOTAL	1		1	

1.3. Damage to aircraft

The aircraft sustained significant damage, primarily to the lower front part of the fuselage, the landing gear and propeller.

1.4. Other damage

Not applicable.

1.5. Personnel information

The pilot, a 59-year-old Spanish national, had an ultralight pilot license (TULM) issued by Spain's National Aviation Safety Agency (AESA), with a multi-axis fixed-wing (MAF) rating that was valid until 31 December 2019. He also had a class-2 medical certificate that was valid until 15 November 2018.

He had a total of 678:38 flight hours on powered ultralights, of which 511:28 had been on the type.

1.6. Aircraft information

1.6.1 General information

The aircraft is an Aerodesign Flight Design CTSW ultralight with a maximum takeoff weight of 450 kg. The accident aircraft has s/n 06-10-23-AR and was built in 2006. It was registered with AESA on 27 May 2009. It is outfitted with a ROTAX 912 ULS engine with 100 HP, s/n 6784039, and 1204 hours of operation.

It had a certificate of airworthiness issued on 1 March 2007 by the National Aviation Safety Agency (AESA).

The aircraft had an insurance policy that was valid until 5 July 2018.

The aircraft's original three-point seatbelts had been replaced by four-point safety harnesses, which were deemed safer.

In March 2015, with 2006 hours on the aircraft, the engine and the silent blocks were replaced, the mount was checked, the exhaust and gasoline lines were replaced, and the gear was fully removed and reinstalled to repair cracks.

One month later, in April 2015, with the same aircraft hours, the propeller was overhauled.

Later, in May 2015, with 2102:35 hours, the airframe was overhauled and the main gear was replaced.

In June 2018, with 3192 flight hours, the engine underwent a 100-hr scheduled check, which involved an inspection of the engine. The oil, oil filter, spark plugs and air filters were also replaced.

On the date of the accident, the aircraft had 3210 flight hours.

1.7. Meteorological information

According to information provided by Spain's National Weather Agency (AEMET), there were no significant phenomena and few to no clouds in the area at the time of the accident.

The closest AEMET weather stations to the accident site were in Toledo, Mora and Aranjuez, located 14 km southwest, 26 km southeast and 27 km northeast, respectively.

The following data were recorded:

Satellite imagery indicates the absence of clouds or significant phenomena in the area. There had been no convective activity in the area in the hours prior to or at the time of the accident.

1.8. Aids to navigation

Not applicable.

1.9. Communications

Not applicable.

1.10. Aerodrome information

The aerodrome of Algodor is a non-controlled aerodrome located in the province of Madrid, 17 km northeast of Toledo.

It has one runway in a 14/32 configuration. It is completely paved and is 430 m long and 15 m wide. The aerodrome is at an elevation of 1739 ft.

1.11. Flight recorders

Not applicable

1.12. Wreckage and impact information

The accident occurred while landing on runway 32 at the aerodrome of Algodor.

The aircraft stopped 37 m beyond the end of the runway in an adjacent crop field. It was inverted, with the nose facing in the opposite direction of the approach.

The aircraft touched down in the final third of the runway. It traveled along the centerline for 78 m. After this, two 45-m parallel tracks were observed on the asphalt that continued until the right shoulder at the end of the runway.

From that point on, outside the runway and on the crop field, there were two parallel tracks that traveled for 37 m, ending at the final location of the aircraft.

As a result of the impact, the aircraft sustained significant damage to the lower front part of the fuselage, and to the landing gear and propeller.

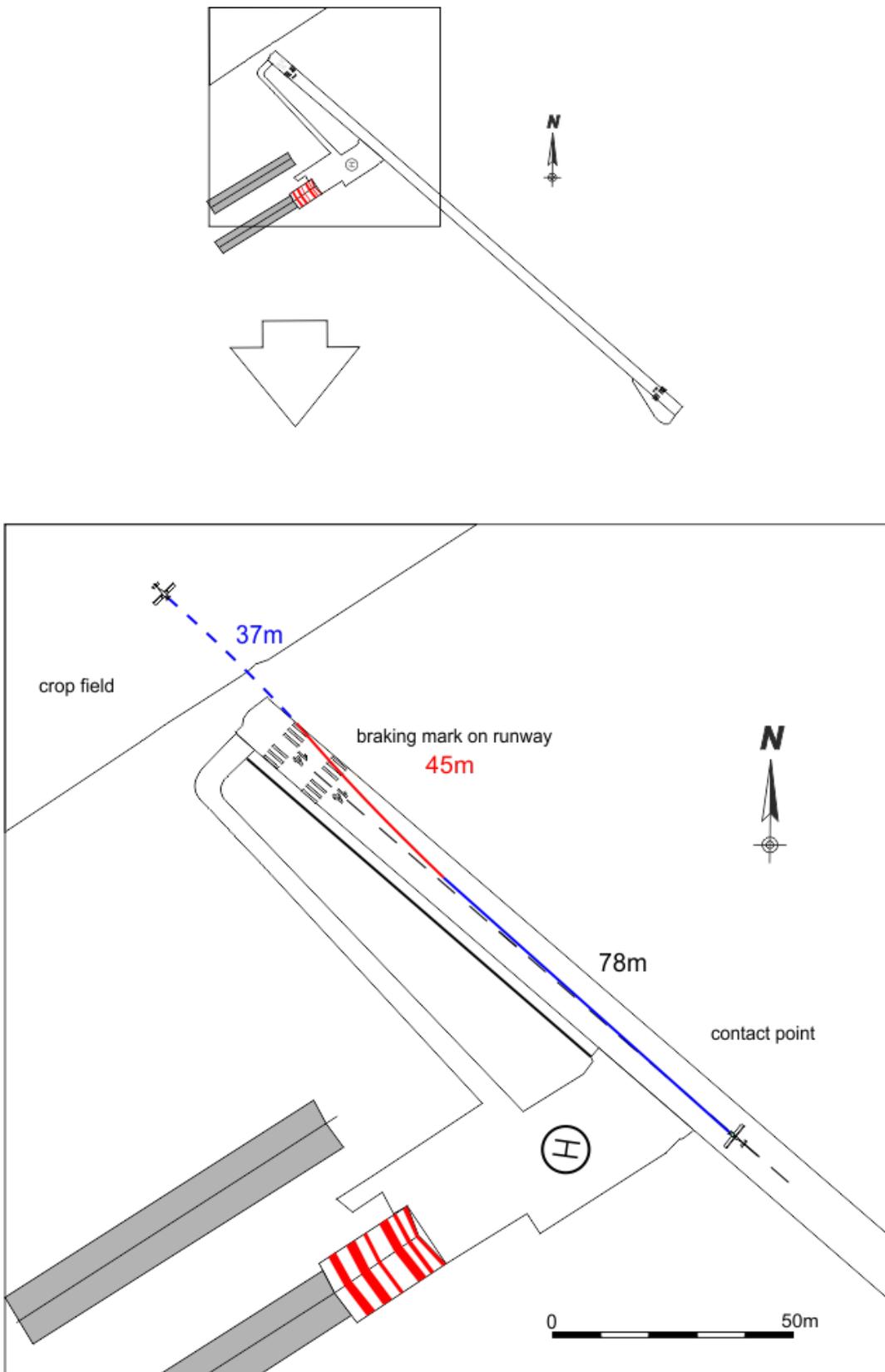


Figure 2. Diagram of the tracks and location of the aircraft

1.13. Medical and pathological information

Not applicable.

1.14. Fire

There was no fire.

1.15. Survival aspects

Not applicable.

1.16. Tests and research

1.16.1. Interview with the pilot

Investigators were able to obtain a statement from the pilot, in which he indicated that he *"had taken off from the aerodrome of Casarrubios (Toledo) with the intention of practicing short-runway landings and takeoffs."*

After doing an initial landing at the aerodrome of Casarrubios, *"to warm up,"* he flew to the aerodrome of Camarenilla (Toledo), where he landed normally on runway 23. He then proceeded to the aerodrome of Algodor.

According to the pilot's statement, *"the weather conditions were good, with a weak, variable wind predominantly from the north-northeast, good visibility (>20 km) and scattered cumulus clouds from thermal convection with ceilings at around 9000 ft. There was a lot of rising air, which suggested the need to fly approaches a little faster in order to offset any thermals encountered on final that could jeopardize the maneuver."*

I landed on runway 32 after completing the relevant circuit to the east of the runway, entering the final leg with 15° flaps at 110 km/h (10 km/h faster than normal for this runway, given its length and the airplane type) so as to offset the temperature effect and any potential thermals that could jeopardize the aircraft by causing it to stall. I touched down before the final third of the runway, practically at the runway exit, and not near the threshold, which would have been preferable.

After touching down I applied the brakes, not having calculated that there was not enough runway remaining to brake completely. Once I realized my mistake, I considered two solutions:

- *Do a go-around, which the length of runway remaining and the low speed I had made this a highly dangerous option if I went airborne in such precarious speed conditions. This could have resulted in a low-altitude stall, with catastrophic consequences not only for the airplane, but for my own safety.*
- *Continue braking, knowing for certain that I would overrun the runway.*

I finally decided for the latter option, thinking it would give me a better chance of walking away from the accident, which was fortunately the case.

I entered the field, which was recently plowed. The ground was soft and the furrows were at a 90° angle to my direction of motion. As a result, after traveling some 20 m, the nose gear collapsed. This dug the propeller into the ground and the aircraft flipped over.

Once the airplane stopped and I regained my bearings, I secured the airplane by turning off the ignition, closing the fuel valve and turning off switches. After releasing my harness, I got out through the copilot's window, which was broken. I waited a while, called some colleagues from the club, who later came to help me, the airfield manager to inform him of the event and, when I saw that the airplane was stable and there was no fire, I approached it, open the pilot's door and deactivated the ballistic parachute. I got a bag and gathered loose items from the cockpit – documents, emergency radio, vests, etc.

Some 15 minutes after the runway overrun, some people approached me and to inquire about my condition.

Once help arrived, we managed to secure the airplane, turn it over and push it to the aerodrome.”

1.17. Organizational and management information

Not applicable.

1.18. Additional information

Not applicable.

1.19. Useful or effective investigation techniques

Not applicable.

2. ANALYSIS

2.1. General

The pilot had the flight license and medical certificate required to make the flight.

The pilot had planned to go on a flight to practice short-runway landings and takeoffs and was familiar with the runway's characteristics.

The aircraft had the documentation required for the flight.

2.2. Of the weather conditions

The data recorded at the various weather stations in the area show that the weather conditions were not limiting for the flight.

2.3. Of the operation

The pilot's statement and an analysis of the wreckage and of the tracks on the ground indicate that the aircraft contacted the runway near the exit taxiway, past the two-thirds point with only 123 m of runway remaining. For the first 78 m, the aircraft traveled along the runway centerline and then, as shown by the tracks on the asphalt, the brakes were applied as the aircraft veered to the right for 45 m before going off the far right corner of runway. It then traveled a further 37 m over the adjacent terrain until the nose gear collapsed, causing the aircraft to turn over.

In his statement the pilot said that he realized he had landed long at a higher speed than normal, and even considered the possibility of going around.

He thought that going around with the little runway distance remaining and at such a low speed would have been extremely dangerous and could have led to catastrophic results; therefore, and cognizant that he would surely overrun the runway, he decided for this option, as it seemed less dangerous.

In this regard, and considering the position he was in, his decision is deemed to have been correct; however, as the final outcome shows, the consideration and decision to go around should have been carried out earlier, when the conditions for safely executing the maneuver still existed.

3. CONCLUSIONS

3.1. Findings

The pilot had the flight license and medical certificate required to make the flight.

The pilot had planned to go on a flight to practice short-runway landings and takeoffs and was familiar with the runway's characteristics.

The pilot did not consider, and therefore did not carry out, a go-around maneuver while the conditions for safely doing so still existed.

The aircraft had the documentation required for the flight.

Weather conditions were not limiting for the flight.

3.2. Causes/Contributing factors

The accident was caused by an improperly executed approach and landing maneuver, which resulted in touching down without sufficient runway remaining.

4. SAFETY RECOMMENDATIONS

None.

