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Report ULM A-020/2020

Accident involving a Tecnam
P-92 ECHO, ultralight aircraft,
registration EG-GQ4, at Alcocer
de Planes Aerodrome (Alicante)



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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 5.6 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 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.

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Abbreviations

° ' "	Sexagesimal degree(s), minute(s) and second(s)
%	Per cent
°C	Degree(s) Celsius
AEMET	Spain's State Meteorological Agency
AESA	Spain's National Aviation Safety Agency
AFM	Aircraft flight manual
AMM	Aircraft maintenance manual
cm ³	Centimetre(s) cubed
E	East
FI	Flight instructor rating
h	Hour(s)
HP	Horsepower
kg	Kilogramme(s)
km	Kilometre(s)
km/h	Kilometre(s)/hour
kt(s)	Knot(s)
l, l/h	Litre(s), litre(s)/hour
LAPL	Light Aircraft Pilot License
LEAL	ICAO code for Alicante-Elche Airport (Alicante)
m	Metre(s)
m ²	Metre(s) squared
MAF	Multi-axis fixed-wing
MHz	Megahertz(s)
mm	Millimetre(s)
N	North
s/n	Serial number
W	West
rpm	Revolutions per minute
TULM	Ultralight aircraft pilot license
ULM	Motorised ultralight aircraft
VFR	Visual Flight Rules

Synopsis

Owner and operator:	Santiago Reig Martínez ULM flight school
Aircraft:	TECNAM P-92 ECHO, EC-GQ4, s/n: P92-E-1534
Date and time of accident:	Wednesday 30/December/2020, 14:50 local time
Site of accident:	Alcocer de Planes Aerodrome - Alicante
Persons on board:	Two (instructor and student pilot)
Type of flight:	General Aviation - Instruction flight
Phase of flight:	Take off – Take off run
Flight rules:	VFR
Date of approval:	24/March/2021

Summary of incident

On Wednesday, 30 December 2020, the TECNAM P-92 ECHO ultralight aircraft, registration EC-GQ4, was preparing to carry out an instruction flight at the Alcocer de Planes Aerodrome in the province of Alicante. During the take-off run, it veered off the side of the runway and impacted rocky terrain, resulting in significant damage to the propeller and landing gear.

The crew were unharmed and exited the aircraft without assistance.

The investigation has revealed the most probable cause of the accident to be a loss of directional control of the aircraft during the take-off phase, due to the late and incomplete correction of the student's manoeuvre by the instructor.

No operational safety recommendations are proposed.

1. FACTUAL INFORMATION

1.1. History of the flight

On Wednesday, 30 December 2020, the TECNAM P-92 ECHO aircraft, registration EC-GQ4, operated by the Santiago Reig Martínez ULM Flight School, began a local training flight at the Alcocer de Planes Aerodrome (Alicante), with an instructor as pilot-in-command and a student pilot on board. It was the student's second training flight.

The student initiated the take-off run on runway 03, and the aircraft began to move towards the left side of the runway. At the point of take-off, the instructor announced he was taking the controls, but the student moved the throttle to idle when they were approximately one metre off the ground, causing the aircraft to drop back onto the runway and veer off it towards an area of rocky ground.

After bouncing several times and travelling about twenty metres from the edge of the runway, the aircraft's nose landing gear and propeller impacted the rocky terrain, and it came to a halt.

The crew were unharmed and exited the aircraft without assistance.



Photograph 1. Aircraft at the accident site

1.2. Injuries to persons

Injuries	Crew	Passengers	Total in the aircraft	Other
Fatal				
Serious				
Minor				
None	2		2	
TOTAL	2		2	

1.3. Damage to the aircraft

The aircraft incurred significant damage to its propeller, landing gear, and the underside of its nose.

1.4. Other damage

There was no third-party damage.

1.5. Personnel information

1.5.1. Instructor

The 61-year-old Spanish instructor and pilot-in-command had the following pilot license issued by Spain's National Aviation Safety Agency (AESA):

- Ultralight pilot license (TULM) issued on 27/05/2013, with a Multi-Axis Fixed-wing (MAF) rating and instructor (FI) rating valid until 31/03/2021.

He had a class 2 medical certificate valid until 23/02/2021 and a LAPL medical certificate valid until 23/02/2022.

He had a total of 346:27 flight hours in ULM aircraft, of which 100:43 hours were in the type of aircraft involved in the incident and 11:04 hours were as an instructor.

His last flight prior to the incident had been an instruction flight on 01/12/2020, with a duration of one hour five minutes.

The accident flight was the first flight the instructor and student pilot had flown together.

1.5.2. Student pilot

The 28-year-old Spanish student pilot had a class LAPL medical certificate valid until 28/10/2025.

He had just started his practical training, and the incident flight was his second flight. His total flight experience was 1:25 hours, performed in the type of aircraft involved in the event.

1.6. Aircraft information

1.6.1. General information

The TECNAM P92-ECHO is an Italian-made single-engine, strut-braced high-wing ultralight aircraft with a fixed tricycle landing gear.

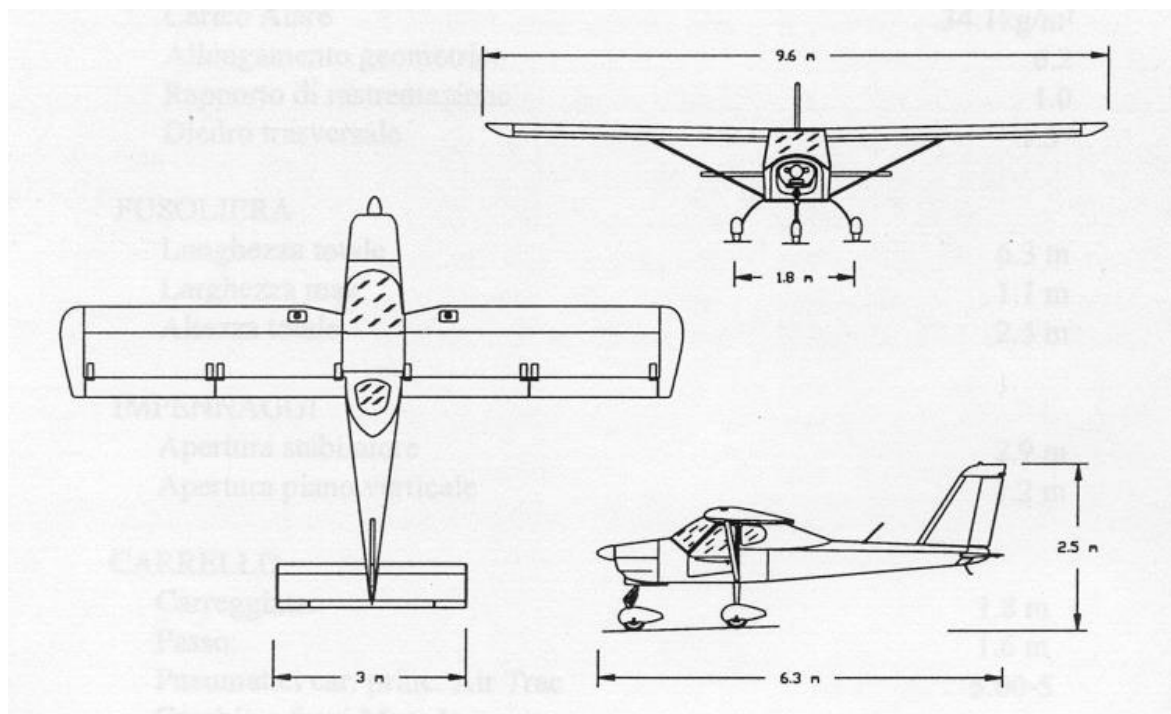


Figure 1. Tecnam P92 ECHO

Dimensions:

- Wingspan: 9.6 m
- Length: 6.3 m
- Wing area: 13.2 m²
- Height: 2.5 m
- Empty weight: 286 kg
- Maximum take-off weight: 450 kg

Engine:

The aircraft was equipped with a ROTAX 912 UL engine, s/n: 6771470 with the following characteristics:

- Maximum power: 80 HP at 5800 rpm
- Four opposed cylinders
- Cylinder capacity 1211.2 cm³
- Mixed water cooling with air-cooled cylinders
- Double carburettor

Propeller:

The propeller installed was a wooden, two-bladed, fixed-pitch Sensenich W68RD2-56, s/n: AK4000.

Fuel:

The fuel authorised and used was AVGAS 100LL. The aircraft had two built-in 35 l fuel tanks (one on the leading edge of each wing) with a drainage valve on the engine bulkhead.

1.6.2. Maintenance information

The aircraft was built in 2015. At the time of the event, both the engine and the airframe had accrued 1240:70 flight hours.

The aircraft's owner was responsible for its maintenance and continuing airworthiness.

It had a maintenance program approved by AESA dated 01/04/2016 valid and in force, where are detailed as scheduled inspections for the airframe, the pre-flight inspections, daily inspections, periodic 100 h or twelve-month overhauls and special inspections at 600 hours and 1200 hours in line with the scopes of tasks stipulated in the manufacturer's AMM and AFM. The 100-hour overhaul tasks are carried out in all of the scheduled inspections.

The engine should be inspected, according to its manufacturer, every 25, 50, 100, 200, and 600 flight hours.

The pilot school was in charge of the scheduled inspections up to 100 flight hours, with a specialist aircraft maintenance workshop performing the more extensive overhauls.

The last maintenance inspection were carried out on 05/11/2020 when the aircraft had 1198:50 flight hours (consisting of the 600 h gearbox check and a complete carburettor inspection); and on 07/11/2020 when the aircraft had 1200 h (consisting of a 100-hour overhaul, changing the oil, spark plugs and filters).

1.6.3. *Airworthiness status*

According to AESA's record of active registrations, the aircraft with serial number P92-E-1534 and registration EC-GQ4 was registered on 29/03/2016, with registration number 9705. The aircraft's 26/11/2020 registration certificate lists the aircraft's base as Muro de Alcoy (Alicante) and the leaseholder as the operator at the time of the incident.

The aircraft had a valid special restricted certificate of airworthiness, no.1498, issued by AESA on 04/01/2016 for the "PRIVATE, AERIAL WORK (SCHOOL) - (3) - NORMAL (ULM) category.

It also had an aircraft station license with reference no.1498/20-01, which included an ICOM A210E communications device and a FUNKE TRT800H transponder.

1.7. Meteorological information

AEMET does not have a meteorological station in the area of the accident, so the following information recorded at the closest stations has been taken as a reference:

- Alcoy: latitude y longitude: 38° 42' 39.6" N, 0° 27' 36" O; altitude: 530 m. Variable wind direction with a speed of about 10 kts and gusts of around 25 kts.
- Jávea: latitude y longitude: 38° 47' 2.4" N, 0° 10' 1.2" E; altitude: 15 m. Practically constant wind direction (around 270°) with an average speed of approximately 10 kt and a gust exceeding 20 kt.
- Alicante-Elche Airport – LEAL: latitude y longitude, 38° 16' 56"N, 0° 33' 29"O; elevation: 43 m. Average wind direction remained practically constant, varying between 280° and 310°. The calculated wind speeds were high, exceeding 10 kt in all the reports, and visibility in all cases was optimal.

Therefore, the meteorological information recorded around the Alcocer de los Planes Aerodrome showed that, at low levels, the conditions were favourable for wind shear and turbulence.

The meteorological conditions consulted by the crew prior to the flight were clear skies, a 300° wind direction and a speed of 5 kts, which meant there was a crosswind on runway 03 during take-off.

1.8. Aids to navigation

The flight was to operate under visual flight rules (VFR).

1.9. Communications

There were no radio communications.

1.10. Aerodrome information

The Alcocer de Planes Aerodrome is located in the north of the province of Alicante at the bottom of a valley formed by the Serpis river, between the towns of Alcocer de Planes and Benimarfull. It is a restricted aerodrome, privately owned by a ULM Club with a ULM flight school.



Photograph 2. Alcocer de Planes Aerodrome

It has a compacted earth runway with a 03/21 orientation, measuring 500 x 30 m. There is no lighting. Its elevation is 320 m, and its GPS coordinates are: 38° 47 '25" N - 000° 23 '59" O.

The aerodrome's traffic pattern is west of the airfield and its radio frequency is 130.125 MHz.

1.11. Flight recorders

The aircraft was not equipped with a flight data recorder or a cockpit voice recorder, as the aeronautical regulations in force do not require any recorders on such aircraft.

1.12. Wreckage and impact information

The aircraft's nose gear hit the runway, lost its nose wheel, and veered off the left side of runway 03, travelling about 20 m over a rocky area of scrub land until the propeller impacted a mound that stopped the aircraft.

The following damage was incurred when the aircraft impacted the ground:

- Nose landing gear: destroyed with loss of wheel.
- Main landing gear: broken anchor points, damaged tyres and brakes.



Photograph 3. Damage to the propeller



Photograph 4. Damage to the landing gear



Photograph 5. Damage to the nose of the aircraft

- Nose cone and broken and deformed propeller coupling flange.
- Propeller: broken and twisted.
- Engine mount: deformed
- Engine: broken exhaust pipes and oil and water distributors.
- Engine cowling and nose fairing: dented and deformed.
- Right wing: damage to the underside of the wingtip and strobe light.

1.13. Medical and pathological information

N/A.

1.14. Fire

Not applicable.

1.15. Survival aspects

Both the student and the instructor were wearing their four-point safety seat belts when the accident occurred, which worked efficiently.

The aircraft's structure retained its shape and there was no damage to the cabin, which meant the crew were able to evacuate without assistance.

1.16. Tests and research

1.16.1. Instructor's statement

After conducting the pre-flight inspection, they entered the head of runway 03 for a local training flight.

According to the instructor's statement, he explained the take-off manoeuvre to the student, telling him that he would correct him if he drifted to either side. His instructions were to proceed at half throttle for two seconds, then power to full throttle by pressing the right pedal and keeping the aircraft on the runway centreline. After approximately 130 m, the aircraft began to drift to the left, so the instructor insisted the student put pressure on the right pedal. Eventually, the instructor put pressure on the right pedal, and the aircraft took off approximately 150 to 160 m from the runway exit.

As the aircraft's nose was slightly angled to the left of the runway axis, the instructor told the student he was taking the controls. The student reacted by pulling the throttle back to idle then taking his hands off the controls. The aircraft was approximately one metre above the ground.

According to his testimony, the instructor then lowered the nose and tried to turn back to the runway, but only managed to bring the aircraft almost parallel to it. He cut the power to the engine, felt a slight bump on the landing gear, and the aircraft bounced back into the air.

He tried to touch down and roll out gently but after a few seconds of taxiing they hit a small obstacle (possibly a stone, according to the instructor) that lifted them off the ground. On dropping back down again, the aircraft lost speed, its nose lowered, and the front landing gear hit a mound a few metres to the left of the runway; the nose wheel came off and the propeller impacted the ground, stopping the aircraft and almost causing it to flip over.

The instructor secured the aircraft and exited with the student, unharmed and unassisted.

1.16.2. Student pilot's statement

The student pilot stated that at approximately 15:00 h on 30 December, they proceeded to the runway after carrying out the pre-flight inspection. He went on to say that, although he couldn't explain why, as he began the take-off run the aircraft drifted to the left until it veered off the runway.

The flight instructor tried to correct the aircraft's trajectory but didn't have time. In the student's words, "the aircraft continued until it hit a hole and fell onto its nose, breaking the nose wheel".

1.16.3. Tests/Inspections

1.16.3.1. Checklists

The school's normal operating procedures state that students should apply the following checklists during the flight phases executed by the crew:

Antes del rodaje

Altimetro Calar QNH
 Avionics Master.....ON
 Radio COM / intercom ON y TEST
 GPS Funcionando
 Trim NEUTRO
 Flaps Arriba
 Radio Solicitar rodaje si procede
 Manga de viento Comprobar
 Plano izquierdo Libre
 Plano derecho Libre
 Trayectoria de rodaje Libre
 Luces..... Según se requiera

Antes de entrar en pista

Prueba de motor REALIZADA OK
 Puertas Cerrar y asegurar
 Cinturones de seguridad Ajustados
 Luz aterrizaje.....Según se requiera
 Válvulas de combustible. Ambas ON
 Fuel pump ON
 Flaps TAKE OFF
 Viento Comprobar
 Autorización (Si procede).....Obtenida
 Chequeo visual tramos base y final.....OK
 ALINEAR PISTA SI ESTA LIBRE
BRIEFING EMERGENCIA.....COMPROBAR

Durante el rodaje

Frenos Comprobar
 Dirección Comprobar
 Trayectoria de rodaje Libre
NO ENTRAR EN LA PISTA SIN VERIFICAR VISUALMENTE QUE REALMENTE ESTÁ LIBRE, COMPROBANDO LOS TRAMOS BASE Y FINAL DE AMBAS APROXIMACIONES.

Despegue

Gas Máxima potencia
 Tacómetro (rpm).+5000 rpm
 Anemómetro.....Vivo
 V Rotación 30 Kts
 V despegue 45 Kts
 V ascenso Flaps 15° 55 Kts
 Altura 300' AGL
 Flaps ARRIBA
 Ascenso 65 Kts
 Luz aterrizaje OFF
 Gas Reducir a 4800-5000
 Fuel pump OFF
 Trim.....Ajustar

CONTINUAR CON ASCENSO NORMAL

1.17. Additional information

Not applicable.

1.18. Useful or effective investigation techniques

Not applicable.

2. ANALYSIS

2.1. Analysis of the meteorological conditions

The meteorological conditions in the Alcocer de Planes Aerodrome (Alicante) area around the time of the event (14:50 local time) were suitable for the flight.

The take-off was executed with a 5 kt crosswind. This meant that when the student throttled back, the aircraft quickly lost speed, and, despite the instructor attempting to land on the runway, it dropped down and bounced off it.

No unforeseen adverse conditions influenced the incident.

2.2. Operational analysis

The student pilot had just started his practical training phase, had 1:25 h of flight experience, and the incident flight was his second flight.

The instructor had 11:04 hours of flight instructor experience. We can assume the instructions for take-off given by the instructor to the student were incomplete, as the procedure to follow in an emergency, particularly any situation where the instructor needs to take the controls, should have been covered in the pre-flight briefing.

Although the instructor told the student that if the aircraft deviated, he would correct its direction, when he took the controls, the student pulled back on the throttle and released them. Therefore, it seems likely that the instructor neglected to explain the procedure to be followed should he have to take control of the aircraft. The instructor failed to supervise the manoeuvre adequately by ensuring he had control of the throttle.

3. CONCLUSIONS

3.1. Findings

- The instructor had an Ultralight pilot license (TULM) with MAF and FI ratings and valid class 2 and LAPL medical certificates. He had a total of 346:27 hours of flying time, of which 100:43 hours were in the type of aircraft involved in the incident and 11:04 hours were as an instructor.
- The student pilot had a valid LAPL medical certificate. He had just started his practical training phase, and the 1:25 h incident flight was his second flight.
- The aircraft was built in 2015, and both the airframe and engine had 1240 flight hours. It was registered on 29/03/2016 and had a valid airworthiness certificate.
- The aircraft's owner performed the scheduled maintenance inspections up to 100 flight hours and contracted a specialist aircraft maintenance workshop to carry out the more extensive subsequent revisions.
- The aircraft's most recent maintenance inspection included all the 100 h-service tasks and was carried out on 07/11/2020 when the aircraft had 1200 flight hours.
- There were no limiting meteorological conditions for visual flight.
- The wreckage analysis confirmed that the nose gear impacted on uneven and rocky terrain, damaging the nose cone, propeller, main and nose landing gear and engine mount, as well as various elements such as the exhaust manifolds and oil ducts among others.
- The investigation has concluded that the aircraft's condition was not a factor in the accident.

3.2. Causes/contributing factors

The investigation has revealed the most probable cause of the accident to be a loss of directional control of the aircraft during the take-off phase, due to the late and incomplete correction of the student's manoeuvre by the instructor.

A lack of flight experience on the part of both, the student pilot and the instructor, is considered as a contributing factor to the accident.

4. OPERATIONAL SAFETY RECOMMENDATIONS

No operational safety recommendations are proposed.