DATA SUMMARY

LOCATION

Date and time	**Friday, 7 April 2006; 19:30 h local time**
Site	**Benabarre Aerodrome (Huesca)**

AIRCRAFT

Registration	**EC-JAV**
Type and model	**TECNAM P92-JS**
Operator	**Ilerdair, S. L.**

Engines

Type and model	**BOMBARDIER-ROTAX GmbH 912 S2**
Number	**1**

Crew

Pilot in command

Age	**25 years**
Licence	**Commercial pilot License Aeroplane (CPL(A))**
Total flight hours	**800 h**
Flight hours on the type	**350 h**

INJURIES

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

DAMAGES

Aircraft	**Left wing, fuselage, engine, undercarriage and propeller**
Third parties	**None**

FLIGHT DATA

Operation	**General Aviation – Private**
Phase of flight	**Landing**

REPORT

Date of approval	**29 September 2006**

1. FACTUAL INFORMATION

1.1. History of the flight

The aircraft, registration EC-JAV, made a routine training flight and had been flying for half an hour. The incident took place during the landing manoeuvre at 17:30 UTC at the Benabarre (Huesca) airfield, coordinates 42° 1' 22" N and 0° 28' 56" E. The approach was made on runway 28. The wind had an average speed of between 10 and 15 kt and direction between 200° and 230°, that is to say, oriented between 50° and 80° of the runway axis. The aircraft was flying the final leg of the airfield circuit with the nose on course 250° (30° to the left of the centreline), and the contact with the runway was very abrupt, causing the aircraft to turn quickly to the left. Then, the aircraft rose slightly from the ground successfully avoiding the unevenness of the runway edge and planed over stones and scrub simultaneously as the aircraft turned more to the left. The aircraft finally stopped after breaking the left leg of the main undercarriage and having struck the left wing on the ground. The pilot was uninjured and left the aircraft by his own means.

1.2. Damage to the aircraft

The damage to the aircraft, as appraised after the impact, was:

— The wooden propeller had broken off and one of the blades was chipped for more than half its length from the end, and the other was chipped and broken from the first third, the other two thirds of its length having been broken off.

Figure 1. Photograph of the final position of the aircraft

Figure 2. Photograph of the status of the propeller

— The engine mounting was buckled, as was the cowling that protects it. Also buckled was the oil cooler, the exhaust and the rest of the elements of which it is comprised had been struck.
— The main landing gear was broken off, and the nose undercarriage leg had also suffered damage.
— All of the lower part of the fuselage was dented
— The left wing showed several strikes at the ends and the leading edge, whereas the right wing did not have any apparent strikes.
— The stabiliser was damaged at its end, but the rudder was not affected
— The rear fuselage was also dented and the hook that is used for banner towing, installed on this airplane, was full of grass due to the impact.

1.3. Information concerning the crew

The pilot had a current commercial pilot's licence for multi-engine airplane with instrument flying ratings. Also, he had an instructor type rating and had accumulated 800 flying hours experience, of which he had made 350 on type. In the last 90 days he had flown 40 h, of which 15 h had been undertaken in the last month.

1.4. Information concerning the aircraft

1.4.1. *Technical Data*

Model of aircraft:	Tecnam P92- JS
Serial number:	038
Year of manufacture:	2004
Model of engine:	Bombardier-Rotax GmbH 912 S2
Serial number:	492303
Model of propeller:	Hoffmann HO17GHM-174 177C

The Tecnam P92-JS is a single-engine, two-seater with braced, high wing and rectangular shape with tricycle landing gear and steerable nose wheel. Maximum zero fuel weight is 450 kg, and the maximum weight at takeoff is 550 kg. These characteristics imply it is included in the category of very light airplanes. It is certified under requirements JAR-VLA.

1.4.2. *Certificate of airworthiness*

The airworthiness certificate was issued on the 31st of August 2005 with a validity of one year.

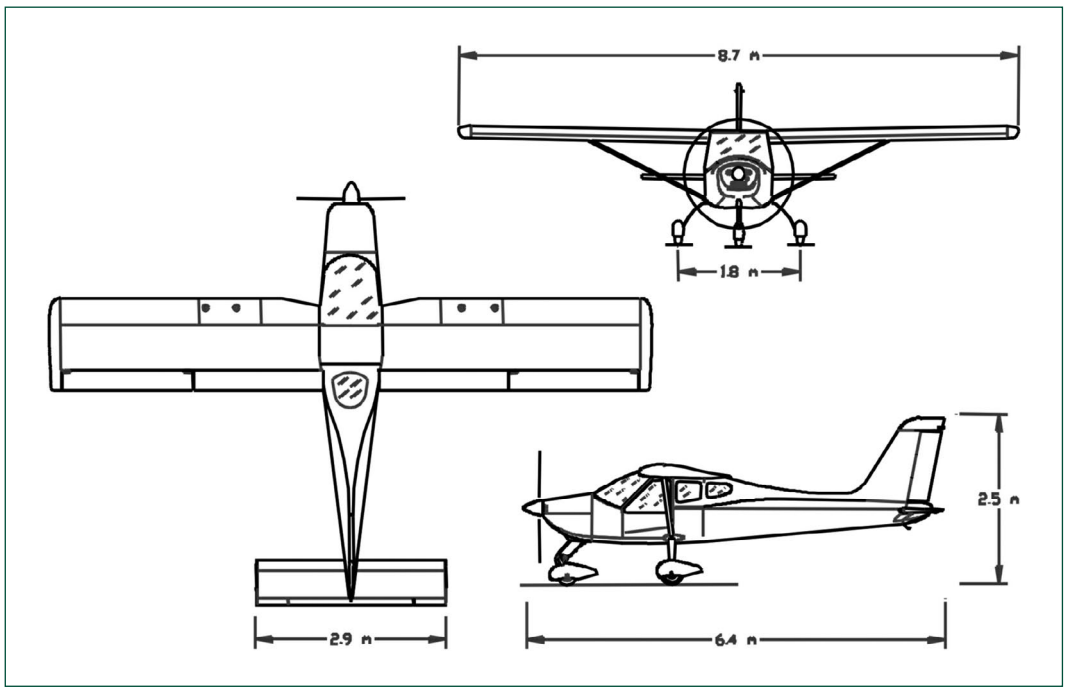

Figure 3. Three view drawing of the aircraft

1.4.3. *Information on the maintenance of the aircraft and the engine*

The aircraft and engine logs were reviewed and it showed that maintenance had been made correctly, complying with the servicing schedule.

1.4.4. *Calculation of the cross-wind component*

In the 'performance' part of the flight manual it is stated that the way to calculate the cross-wind component is by using the abacus shown in Figure 4. The initial data are the wind direction and its speed in knots. The maximum demonstrated cross-wind component on landing is 15 kt.

In this case the wind direction was between 200° and 230°, and the speed was between approximately 10 and 15 kt. Taking into consideration the worst-case scenario, which would be where the wind direction would be 200° (close to perpendicular to runway 28), this would incur a wind component that would form an angle of 80° with the flight direction, and a speed of 15 kt, which is greater than those under consideration.

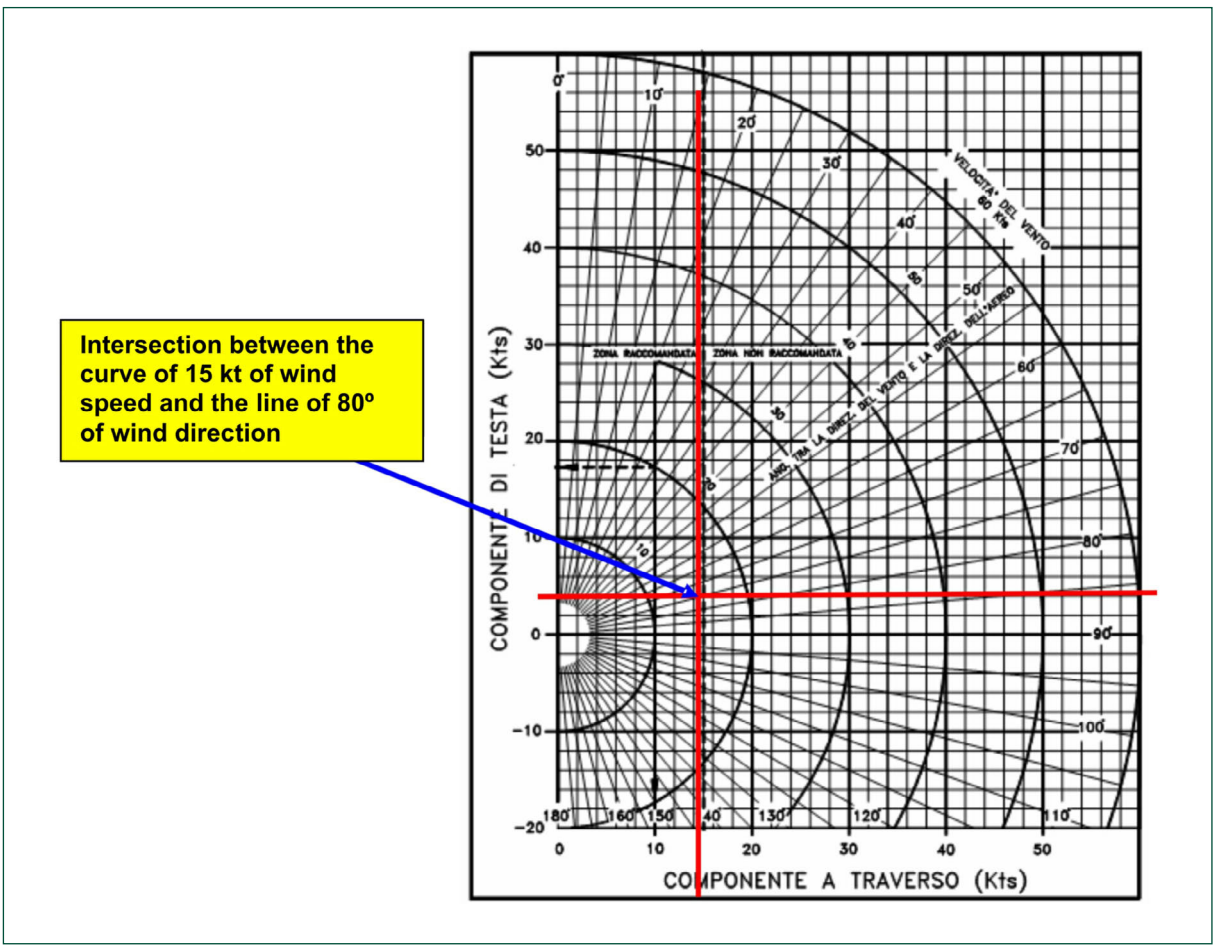

Figure 4. Table for calculation of the cross-wind component

With this data, it is obtained from the table that the maximum cross-wind component would be 14 kt. This result would be near to 15 kt, which is the maximum component described in the manual.

1.4.5. *Considerations over the aborted landing*

In the flight manual the procedure to make an aborted landing textually says "In the aborted landing manoeuvre, the flaps will have to be retracted immediately after the application of maximum power".

1.5. Pilot Statement

The incident took place during the landing manoeuvre after a half-hour training flight when landing on runway 28 with a cross wind at a speed of between 10 and 15 kt.

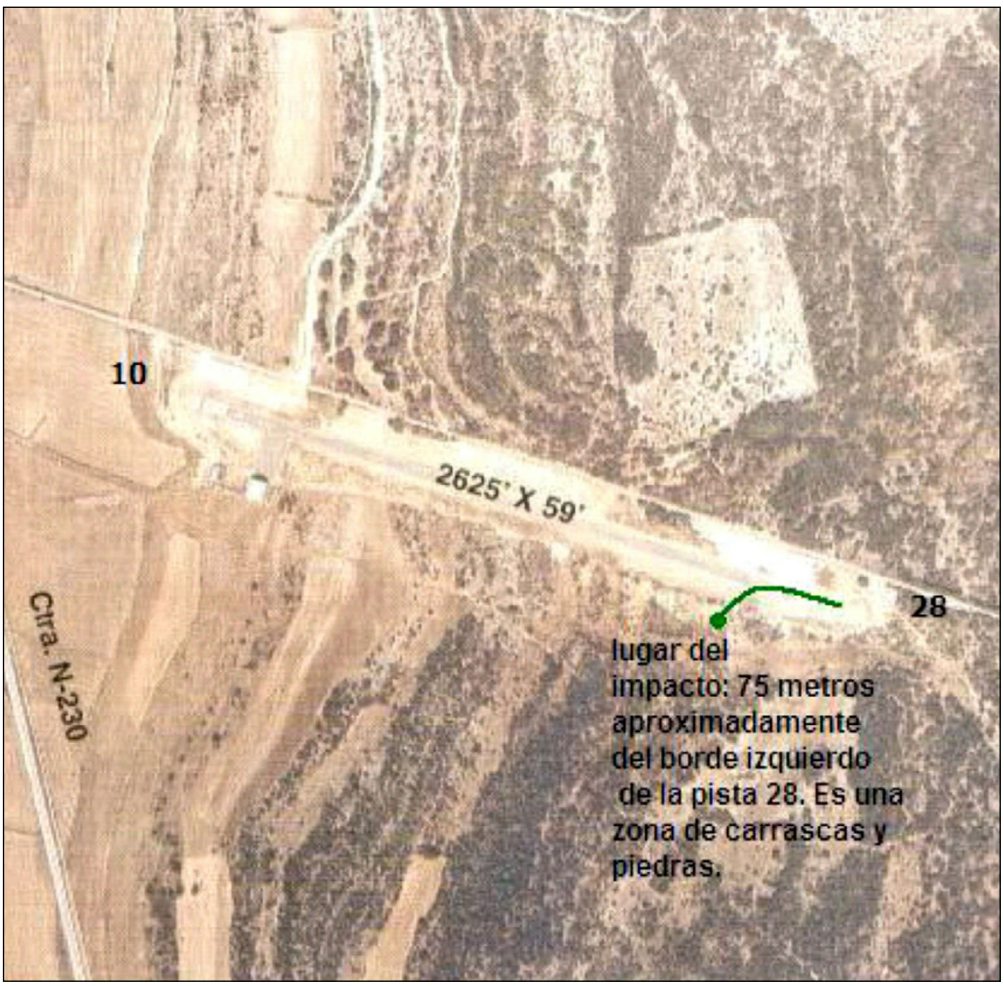

Figure 5. Trajectory of the aircraft

The runway has a steep incline and the contact was made some 30 m after the apron and it was reasonably hard, after which the aircraft quickly started to turn towards the left when it was approximately 70 m down the runway. The pilot applied right foot and did not achieve correction. As he saw that the direction of the aircraft was deviating from the runway he applied maximum power with the intention of becoming airborne again, but all he succeeded in doing was to make the aircraft go more to the left due to the effect of the torque of the engine. He also managed to lift the aircraft half a meter from the ground. By doing this he avoided the slope on the runway edge and planed over the scrub and baby oaks as the aircraft braked over them. He could see that the left leg of the main undercarriage was broken. The distance that the aircraft travelled from the runway was between 60 and 70 m approximately.

1.6. Meteorological Information

The only weather data available to the pilot at the time of the incident was from the wind-sock, which indicated a wind direction of between 200 and 230° approximately, and a constant speed of between 10 to 15 kt, although according to his estimation, the wind could have reached 15 kt at some times, even exceeding 20 kt. The cloud ceiling was, at the first hour of the afternoon 5,000 or 5,500 feet with scattered clouds, evolving to broken clouds and ending up at dusk with weak rain.

1.7. Additional Information

1.7.1. *Techniques for landing in a cross-wind*

Commonly there are two techniques to make the landing manoeuvre in a cross-wind, known as "sideslip" (cross control) and "crabbing" (drift correction). Both techniques may be combined during a given approach.

The method of cross control consists of lowering the wing on the windward side and avoiding turning with the opposite pedal throughout the descent. If the wind speed is varying while descending, this method requires continuous adjustments by cross control. The method for drift correction consists of undertaking the final approach by establishing a heading (crab) toward the wind with the wings level, without any roll, and just prior to touchdown the longitudinal axis of the airplane is aligned with the runway axis applying rudder.

Once the aircraft is on the ground and as it is losing speed, the head-wind component diminishes gradually, whereas the cross-wind component stays constant. In these conditions the aircraft will act as a weathercock tending to orientate itself to the wind and necessitating the use of the brakes and the rudder to maintain control. During the complete landing roll it is necessary to continue applying lateral control against the wind.

2. ANALYSIS

2.1. Analysis of the landing manoeuvre

In this case the aircraft made the final approach with the nose at a 30° deviation to the left of the runway. It was not possible to confirm whether any of the previously described techniques was consciously used to carry out the landing. At some moment during the approach the left wing had to turn to windward because otherwise the wind would have turned the airplane towards the right. Simultaneously, the pilot was trying to correct with the right pedal but without aligning the nose at any time. The wind came from the left practically perpendicular (at 80°) to the runway axis and at 14 kt, which is almost the maximum component allowed. The aircraft's light weight contributed decisively to the weathercock effect (tendency of the airplane to orient its longitudinal axis towards the wind), in addition to the fact that the nose was already deviated from the runway at the beginning of the approach. For that reason, the action on the rudder was not enough to counter the roll control applied and it was not possible to align the aircraft.

Once the left wheel touched the ground, the load on it was higher than its design limit and in addition, when leaving the runway, it was forced to roll over unprepared terrain, which contributed to the breaking of the landing gear.

When trying to make the go around manoeuvre, the ground clearance was too low and the flaps were not retracted, as indicated in the procedure. For that reason, with the aerodynamic drag being too high, the engine power was not sufficient to obtain the required lift for the aircraft to rise.

3. CONCLUSIONS

It is considered that the incident resulted from the simultaneous concurrence of several factors:

— The cross-wind component was almost the maximum allowed for landing
— None of the usual techniques for cross-wind landing were used
— No attempt was made to align the aircraft with the runway axis until the end
— The weathercock effect was increased by the light weight of the airplane.
— The go around manoeuvre was not made according to the established procedure, since the flaps were not retracted after applying maximum power and this was critical to the aircraft not being able to return to the air.