DATA SUMMARY

LOCATION

Date and time	**Wednesday, 29 March 2006; 14:53 UTC**[1]
Site	**Santander Airport (LEXJ)**

AIRCRAFT

Registration	**N65MJ**
Type and model	**BEECHCRAFT 58P**
Operator	**Private**

Engines

Type and model	**TELEDYNE CONTINENTAL Motor TSIO-520-WB**
Number	**2**

CREW

	Pilot in command	Copilot
Age	**43 years**	**N/A**
Licence	**PPL**	**CPL**
Total flight hours	**225 h**	**710 h**
Flight hours on the type	**117 h**	**42 h**

INJURIES

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

DAMAGE

Aircraft	**Damage in the nose landing gear and propeller blades**
Third parties	**None**

FLIGHT DATA

Operation	**General Aviation – Private**
Phase of flight	**Take off roll**

REPORT

Date of approval	**27 June 2007**

[1] Time reference in this report is Coordinated Universal Time (UTC) unless otherwise stated. It is necessary to add two hours to obtain the local time.

1. FACTUAL INFORMATION

1.1. History of the flight

On 29 March 2006, aircraft N65MJ was making a flight from Coventry (EGBE) to Jerez (LEJR) with two people aboard. It landed at Santander Airport (LEXJ) at 12:50 to refuel. The technical stopover complete, the crewmembers prepared to resume their trip to LEJR. During the takeoff run, while at 75 kt, they reported feeling a vibration through the control stick, after which the aircraft dipped forward, striking the runway with the nose and both propellers. The aircraft continued moving in a straight line and eventually drifted to the right of the runway before coming to a stop on the runway. The crew cut the mixture and gas, and the magnetos, battery and alternators were disconnected.

The occupants were not injured and exited the aircraft under their own power.

The airport's Firefighting Service (SEI) responded to the scene and discharged foam as a preventive measure.

The aircraft's nose section (heating and radar), nose gear, propellers and engines were damaged (see Picture 1).

The runway remained out of service until the aircraft was removed, almost two (2) hours after the incident. An inspection of the runway revealed tire debris and impact marks from the propellers.

Picture 1. View of the aircraft following the incident

1.2. Personnel and aircraft information

The crew had valid licenses and medical certificates. The pilot at the controls had 225 flight hours, 117 of them on the type. The copilot had 710 flight hours, 42 of them on the type.

The aircraft had valid Registration and Airworthiness Certificates. It had just completed a 50-hour inspection that same day, during which the main gear tires had been replaced. The maintenance center stated that the nose gear tire had been inspected but not replaced, though its pressure had been adjusted to that specified in the Maintenance Manual.

1.3. Meteorological information

According to airport data, wind conditions at the time of the incident were as follows:

- On runway 29, 15 kt from 170 degrees, gusting up to 22 kt.
- On runway 11, 13 kt from 180 degrees gusting up to 20 kt. (According to ATC communications (see Section 1.4), the last information given by TWR moments before the start of the takeoff run indicated 16 kt from 180 degrees, gusting up to 22 kt.)

Horizontal visibility was 40 km and the runway visual range was in excess of 2,000 m. CAVOK conditions prevailed (clear skies and visibility in excess of 10,000 m), with no cloud ceiling or convective clouds. The temperature was 20 °C and the dew point 7 °C. QNH was 1,014 mb.

1.4. ATC Communications

According to ATC communications with the control tower (TWR), the aircraft was cleared to start its engines at approximately 14:35. The wind at that time was from 200 degrees at 12 kt and runway 29 was in use. Minutes later, TWR cleared the aircraft to taxi, enter the runway and line up, indicated that the wind had shifted slightly to the east, 190 degrees and 15 kt, and asked the crew if it would rather use runway 11. The crew responded affirmatively and received a new clearance from TWR, which assigned it a departure point, initial flight level and transponder code. When the crew reported entering runway 11, TWR provided it with new wind data (180 degrees, 16 kt gusting up to 22 kt) and cleared it for takeoff. The crew acknowledged the data and informed it was commencing its takeoff run. Later the vehicle with the Chief of Firefighting Services onboard informed TWR that it was proceeding to the incident site.

1.5. Aircraft operations under crosswind conditions

During the takeoff run, by procedure the pilot should perform a check of the flight instruments at 70 kt before starting rotation at 81 kt.

According to the aircraft's Flight Manual, the maximum crosswind component is to be limited to 30 kt.

It should be noted that under crosswind conditions, the wind tends to push the aircraft laterally, creating considerable tension on the landing gear wheels.

1.6. Impact and runway trajectory

Upon inspecting the runway, airport personnel discovered tire debris. The skid marks from the nose gear and the impact marks from the propeller on the asphalt started at the runway center line light located at the 950-meter point.

From that point on, the aircraft continued moving forward on the runway another 345 m, the first 175 in a straight line before drifting to the right and coming to a stop near the right edge of the runway. The aircraft did not leave the runway (see Picture 2).

The nose gear structure was bent backwards in such a way that the nose and propellers were resting on the asphalt. The nose gear tire displayed a circular cut but retained its integrity (see Picture 3).

Rotura de neumático = Tire Rupture
Posición final de la aeronave = Aircraft's final position
Viento 180° = Wind at 180°

Picture 2. Path taken by the aircraft

Picture 3. Detail of the nose gear

2. ANALYSIS AND CONCLUSIONS

The nose gear tire had not been replaced during the maintenance check performed just before the flight to Santander, although its pressure had been adjusted. It is very likely that the tire's characteristics had been degraded by repeated low-pressure cycles (deformed casing, uneven wear, higher bending of the sidewalls). It is not known whether this loss of pressure reappeared following the check. Low tire pressure translates into increased friction since the contact area between the tire tread and the asphalt is larger. To this must be added the lateral forces produced by the crosswind on the nose wheel.

The circular shape of the cut in the tire appears to have been caused by a large momentary force on the nose wheel tire of such a magnitude that it allowed the casing to come in contact with the rim.

Given the prevailing crosswind conditions and the strong gusts, the aircraft probably bounced, lifting slightly only to fall again before reaching flying speed. At that time the crew was most likely focused on the cockpit (checking instruments), so the unexpected lifting of the aircraft could have instinctively led the crew to dive the airplane. The impact of the nose gear with the runway center line light and a possible low pressure of the tire contributed to the failure of the tire, and the resulting folding back of the nose gear.

The most likely cause of the collapse of the nose gear support structure, therefore, is considered to be the rupture of the tire as a result of low pressure while taking off under high intensity crosswind conditions.