

INCIDENT

Aircraft Type and Registration:	BD700 Global Express, N618WF
No & Type of Engines:	2 BR700-710A-20 turbofan engines
Year of Manufacture:	1999
Date & Time (UTC):	12 January 2009 at 1352 hrs
Location:	Runway 26 Luton Airport
Type of Flight:	Commercial Air Transport (Non-Revenue)
Persons on Board:	Crew - 3 Passengers - None
Injuries:	Crew - None Passengers - N/A
Nature of Damage:	Left wing: tip (underwing), front edge slat, trailing edge flap, flap track fairings
Commander's Licence:	Airline Transport Pilot's Licence
Commander's Age:	49 years
Commander's Flying Experience:	5,600 hours (of which 900 were on type) Last 90 days - 120 hours Last 28 days - 55 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot and further enquiries by the AAIB

Synopsis

The aircraft was on final approach to Runway 26 at Luton Airport with the autopilot engaged. At about 210 ft above the touchdown zone, the aircraft suffered a disturbance probably due to a gust of wind. The autopilot was disengaged below a radio altitude of 10 ft but there was insufficient time for the pilot to prevent the left wingtip hitting the runway, marginally before the left landing gear. It is possible that the unusually high rate of decrease of radar altitude, a feature of the approach to this runway, contributed to the late disconnection of the autopilot.

History of the flight

The aircraft was on final approach to Runway 26 at Luton Airport and the crew had been instructed to maintain 160 kt to four nautical miles on the approach. The pilot reported that the wind was "53 kt, just from the left". At four nautical miles from touchdown, full flap was selected and the speed was reduced to 121 kt which corresponded to V_{REF} plus five knots. The pilot stated the approach was stable and that ATC reported the surface wind from 210°/15 kt.

The pilot reported that "below about 150 ft, but probably a lot lower, the left wing dropped, the nose pitched up and the plane suddenly lost height". N618WF landed

and the pilot was unaware of any further incident. After parking, the marshaller brought to the pilot's attention the fact that the left wing had been damaged.

The pilot believed the incident was caused by a strong gust of wind or some windshear just before landing.

Aircraft damage

Damage was limited to the left wing. A small section of the trailing edge of the flap delaminated. There was scrape damage to the underside of one flap track fairing and to the tip of another. The outboard end of the leading edge slat was damaged immediately inboard of the navigation light. There was scuff damage to the composite material underneath the wing tip.

Flight data recorder (FDR) information

The aircraft manufacturer provided the AAIB with data from the FDR. The data showed that the approach was flown by the autopilot, which was disengaged between 10 ft and 2 ft radar altitude. The auto-throttle was disengaged between 4 ft and 0 ft radio altitude.

During the last 80 seconds of flight, the flight management system (FMS) commanded a speed of 121 kt and the IAS deviated from this value by ± 6 kt. In the five seconds before touchdown the IAS dropped from 124 to 114 kt. During the approach, the pitch attitude varied by 2° either side of a mean value of approximately 4° nose up. In the three seconds before touchdown, the nose attitude increased to 8° nose up.

During the approach, the bank angle varied by up to 10° either side of wings level. Twenty seconds before touchdown, at about 210 ft above the touchdown zone, there was a wing drop from wings level to 10° left wing low followed by a reversal over five seconds to 8° of right bank. The bank angle reduced slightly over

the next four seconds but returned to 8° six seconds before touchdown. In the following six seconds, the bank angle changed from 8° right wing low back to 9° left wing low. Approximately half a second before the left landing gear touched the runway, the bank angle reversed direction abruptly, probably due to the wingtip coming into contact with the surface. The left landing gear weight on wheels switch activated between 4 ft and 2 ft radar altitude.

Wind velocity

The crosswind component of the wind velocity was forecast to be 13 kt, temporarily 16 kt gusting to 26 kt.

Airplane Flight Manual

The airplane flight manual states that the minimum altitude for the autopilot to be used '*for a precision approach (Category I or II ILS) is 50 ft AGL*'. The Global Express is not equipped with an autoland capability.

UK Air Information Publication (AIP) entry for Luton Airport

The UK AIP entry for Luton Airport states that

'due to the sloping terrain in the approach area of ILS Cat II operations, the rate of radio altimeter height reduction prior to the threshold will be approximately double the normal rate.'

Analysis

It appeared that while descending through approximately 210 ft above the touchdown point, the aircraft suffered a disturbance which caused it to roll first left, then right and then left again. It is probable that the disturbance was caused by a gust in the wind. During the second roll to the left, the IAS decreased and the nose pitched up, possibly due to the autopilot trying to maintain the ILS glideslope at the lower

speed. This left the aircraft in a nose up, left wing down attitude when the left wingtip hit the runway marginally before the left landing gear.

Following the initial disturbance, the autopilot was unable to regain a normal aircraft attitude before it was disconnected. After disconnection at between 10 ft and

2 ft radar altitude, N618WF was at such a low level that the pilot had insufficient time prior to landing to prevent the wingtip impacting the runway. The unusually high rate of decrease of the radar altitude may have contributed to the pilot disconnecting the autopilot below its minimum disconnection height.