

## ACCIDENT

<b>Aircraft Type and Registration:</b>	Piper PA-28-140 Cherokee, G-COLH	
<b>No &amp; Type of Engines:</b>	1 Lycoming O-320-E2A piston engine	
<b>Year of Manufacture:</b>	1967 (Serial no: 28-23143)	
<b>Date &amp; Time (UTC):</b>	30 October 2014 at 1345 hrs	
<b>Location:</b>	Full Sutton Airfield, Yorkshire	
<b>Type of Flight:</b>	Private	
<b>Persons on Board:</b>	Crew - 1	Passengers - 2
<b>Injuries:</b>	Crew - None	Passengers - 1 (Serious)
<b>Nature of Damage:</b>	Significant damage to upper fuselage	
<b>Commander's Licence:</b>	Private Pilot's Licence	
<b>Commander's Age:</b>	19 years	
<b>Commander's Flying Experience:</b>	121 hours (of which 2 were on type) Last 90 days - 12 hours Last 28 days - 12 hours	
<b>Information Source:</b>	Aircraft Accident Report Form submitted by the pilot, Pilot's Operating Manual information, and published guidance on light aircraft performance matters	

## Synopsis

The aircraft experienced a multiple bird strike on final approach. The pilot continued to a landing but the aircraft landed long and there was insufficient runway remaining in which to stop. The aircraft overran onto unprepared ground and overturned. The occupants vacated the aircraft, with one passenger suffering a serious injury.

## History of the flight

The pilot reported that the accident occurred at the end of a flight from Wellesbourne Mountford Airfield, near Stratford-upon-Avon, to Full Sutton Airfield near York. As the aircraft approached Full Sutton, the pilot assessed the surface wind as blowing directly across the single grass runway (04/22), so elected to land on Runway 04. The visibility was good, but there had been recent rain and the grass surface was described as soft and wet. The final approach was flown with full flap (40°) and at an approach speed of about 75 kt. Aircraft mass for the approach would have been about 872 kg, about 10% below the maximum permitted.

Late on the final approach, the pilot noticed a flock of birds on the runway. She thought they would disperse as the aircraft got nearer but, as the aircraft descended though about 100 to 150 ft, the birds rose from the runway and into the aircraft's path. The aircraft struck at

least two birds; one hit the left wing, and one hit the propeller which left bird remains on the windscreen on the passenger's side. Being concerned for the safety of the aircraft, the pilot continued the approach. The aircraft landed some distance along Runway 04, immediately beyond the point where a hard taxiway crossed the grass runway.

The aircraft landed on all three wheels together and the pilot applied wheel brakes, but the aircraft appeared to skid on the wet grass and did not decelerate. It overran the runway onto the adjacent field, where it encountered uneven ground and overturned. The pilot and her two passengers evacuated the aircraft through the left cockpit window. It was subsequently established that one of the passengers had suffered a hairline fracture of an arm.

The pilot believed that the encounter with the birds had led to her landing further along the runway than intended. This, combined with the lack of braking action on the wet grass, had led to the overrun. The surface wind at Leeds Bradford Airport (29 nm to the west) at the time of the accident was 8 kt from 210°, so it was possible that a small tailwind component was present for landing.

### **Airfield information**

Full Sutton Airfield has a single grass runway, designated 04/22. The published length and landing distance available on Runway 04 is 772 m. A hard taxiway (formerly a runway) crosses Runway 04 about 420 m from the start of the runway. About 330 m of runway is available for landing beyond the hard taxiway.

### **Light aircraft landing performance**

The manufacturer's Pilot's Operating Manual for the PA28-140 gives take off and landing performance data, based on a standard aircraft at maximum mass (975 kg). The data assumes a landing on a level paved runway, in zero wind, with 40° flaps, using an approach speed of 62 kt and touching down on the main wheels at between 48 and 56 kt. The landing distance required from 50 ft in this case is 330 m.

Guidance for pilots of light aircraft in respect of takeoff and landing performance is published by the CAA in its *Safety Sense Leaflet 7c: Aeroplane Performance*, and also in the UK Aeronautical Information Circular (AIC) 127/2006. Information in these two documents highlights the fact that the manufacturer's performance figures are those achieved by a highly experienced pilot in ideal conditions using a new aircraft. The figures should be factored to take account of the actual conditions (factors being multiplied together), and it is strongly recommended that an additional safety factor (mandatory for commercial operations) is applied when deciding on the suitability of a particular runway for landing. The main conditions and performance factors pertinent to this case are shown at Table 1.

Condition	Increase in landing distance from 50 ft	Factor
A 10% decrease in aircraft mass	-10%	0.9
Wet grass up to 20 cm length (firm soil)	35%	1.35
Very short wet grass (firm soil)	60%	1.6
Tailwind component 10% of landing speed	20%	1.2
Soft ground	25% or more	1.25+
Additional safety factor		1.43

**Table 1**

Landing distance conditions and correction factors

Based on the aircraft details supplied by the pilot and using a tailwind of up to 5 kt, the expected landing distance from 50 ft would have been between 600 m and 710 m (depending on which factor is used for the wet grass), before any allowance is made for an increased approach speed or additional safety factor is added.

### Discussion

The relatively inexperienced pilot was faced with a critical situation just before landing and had to decide quickly between continuing to a landing some way up the runway or to go-around and make a further approach with the full landing distance available. Uncertainty over the aircraft's condition and the probable shock factor of an unexpected and unpleasant event would have been factors in the pilot's decision to continue the approach. The pilot did not intend to land long but it was a consequence of her decision.

Pilots require a good understanding of the factors influencing landing performance, as well as an appreciation of how these factors can combine to produce unexpectedly long landing distances, even in normal operation. By applying this knowledge to the runway in use on the day, a pilot should be able to determine an acceptable touchdown area, beyond which there is an increasing risk of overrunning the runway.

The value of having this knowledge can be seen in situations such as that reported on here, whereby an emergency situation develops quickly, leaving the pilot very little time to decide on the safest course of action.