ACCIDENT

Aircraft Type and Registration:	Piper PA-30 Twin Comanche, G-ATMT
No & Type of Engines:	2 Lycoming IO-320-B1A piston engines
Year of Manufacture:	1964
Date & Time (UTC):	14 August 2011 at 1315 hrs
Location:	Maypole Aerodrome, Kent
Type of Flight:	Private
Persons on Board:	Crew - 1 Passengers - 3
Injuries:	Crew - None Passengers - None
Nature of Damage:	Main and rear wing spars bent, skin rippling
Commander's Licence:	Basic Commercial Pilot's Licence
Commander's Age:	59 years
Commander's Flying Experience:	10,400 hours (of which 2,000 were on type) Last 90 days - 24 hours Last 28 days - 12 hours
Information Source:	AAIB Investigation

Synopsis

The aircraft was damaged during a hard landing. The landing distance required shown in the aircraft flight manual was greater than the length of the grass runway. Low airspeed on short final may have been a factor.

History of the flight

The aircraft left Alderney on a private flight to Maypole Airfield. The pilot, three passengers and a small amount of baggage were on board. The fuel load was 470 lb of Avgas, the wingtip tanks were relatively full, the takeoff weight was 3,484 lb, and the pilot calculated that the centre of gravity was near the centre of the allowable range. The pilot planned to visit an event at Maypole, run by an aviation organisation with which he was associated, on his way back to the aircraft's base.

Before flight, he obtained weather forecasts for a number of airports, the only mainland UK one being Southampton, where the forecast wind was westerly at 8 kt. The weather throughout southern England was fine, with a relatively high cloudbase and good visibility.

During the flight, the pilot selected wingtip tank fuel for a short time but recalled that there was still a significant quantity of fuel in the wingtip tanks on landing. Before reaching his destination, he obtained weather information including the latest Manston METAR.

The pilot contacted the air/ground radio operator at Maypole and was informed that Runway 20 (which had

a grass surface) was in use. The airfield website stated that Runway 02/20 was 560 m long, and that:

> *'clearways at either end (not useable in winter months) give 700 m maximum.'*

Runway 02 sloped uphill, but the airfield operator had not measured the slope.

The pilot joined the circuit for Runway 20, but before turning onto final approach, he saw another aircraft making an approach onto Runway 02, and he flew away from the circuit area and re-joined for an approach onto Runway 02.

The pilot usually flew the approach with full flap at 95 KIAS, reducing to 80 KIAS shortly before touchdown. He stated that he would have monitored airspeed indications, but that "I don't think anyone who's experienced on an aeroplane… looks at the airspeed indicator whilst they are on the approach …". He added that "When you fly an aeroplane regularly, I don't think you stare at the airspeed indicator".

When interviewed some months after the accident the pilot could not recall what indications the windsock had given during the approach. He stated that the wind was variable in direction, and that there was "a lot of sink" on final approach, which prompted him to apply "a lot of power". The touchdown was "quite firm" and the aircraft yawed significantly on touchdown, which he countered with rudder and differential power. The landing run was short. An eyewitness commented that the aircraft fell suddenly immediately before touchdown.

The pilot inspected the aircraft after it had been moved clear of the runway. He saw that the left main landing gear tyre had deflated and that there were "definite lines" on the wing skin. Subsequent engineering inspection confirmed that the left wing main and rear spars were distorted and the left main landing gear had over-travelled.

Performance

The landing weight was calculated to have been approximately 3,300 lb. The aircraft flight manual[1] showed that the approach speed at the landing weight would have been approximately 76 KIAS. It added that:

> *'in all cases, turbulent air or crosswind may dictate higher approach speeds and judicious use of flaps.'*

Examination of the landing distance table in the flight manual, and addition of the factor for a dry grass runway given in the flight manual[2], of 10%, showed that the minimum landing distance required (with a safety factor of 100/70 included in the flight manual graph) was 972 m. Without the flight manual 100/70 safety factor, the actual landing distance (on grass) was 618 m.

The airfield website stated that the runway length, including *'clearway'* was 700 m. Discussions with the airfield operator revealed that the available runway length was 700 m, when the ends were not water-logged. The whole distance was available on the date of the accident.

The pilot stated that he felt under no pressure to carry out a slow approach.

Footnote

[1] At a gross weight of 3,600 lbs, on a normal two-engine approach, the runway threshold should be crossed at 79 KIAS, this speed reducing by 1 mph (0.87 kt) for every 100 lbs reduction in weight.

[2] CAA Safety Sense Leaflet 7 *'Aeroplane Performance'* suggests a factor of 15% for dry grass up to 20 cm on firm soil.

Meteorology

The European Low Level Spot Wind Chart for flights between 0900 and 1500 hrs on the day of the accident showed that the 2,000 ft wind near Maypole was approximately westerly at 10-15 kt. This suggests that the surface wind was west-south-westerly at 7-12 kt.

METARs at Manston Airport (7 nm east of Maypole) were:

141250Z 23008KT 160V290 9999 SCT041
22/11 Q1007=
141320Z 26007KT 200V320 9999 SCT043
21/10 Q1007=

Analysis

The flight towards Maypole Airfield was routine until the aircraft joined the circuit. Although the pilot was informed that Runway 20 was in use, he followed another aircraft's example and made an approach to Runway 02. The meteorological information suggests that there may have been a tailwind on Runway 02, and that Runway 20 (as promulgated by the air/ground radio operator) would therefore have offered a slight headwind.

The landing distance available, assuming that the *'clearway'* mentioned on the airfield website was available for the landing run, was less than the landing distance required indicated in the aircraft flight manual, and 82 m more than the unfactored landing distance required.

In these circumstances a pilot might be particularly focussed on achieving an accurate touchdown close to the beginning of the runway and without excessive speed, although in this case the pilot stated that he felt under no such pressure. Although the flight manual speed for short final at his approximate landing weight was 76 KIAS, and the flight manual suggested that turbulence may dictate higher approach speeds, he stated that he used his routine approach speed of 80 KIAS. His habit of giving greater attention to outside cues than the information from the ASI may have been a factor in the aircraft reaching a low speed without him being aware.

If there is a tailwind component, a pilot who judges speed primarily by reference to cues outside the aircraft, which relate to groundspeed rather than IAS, may fly too slowly. It is possible that the pilot, already focussed on achieving a prompt touchdown on a relatively short runway, may have allowed the speed to reduce close to, or down to, the stall, immediately before touchdown, precipitating a heavy landing.

The "sink" (loss of energy) encountered on approach may also have contributed to the development of a low speed situation.

A stall, at low height, would be consistent both with the damage sustained by the aircraft and the witness account. The mass of the wingtip tank fuel may have contributed to the bending load on the main and rear spars.

Reporting of the accident

A third party notified the AAIB of the accident in February 2012. The pilot did not consider that the damage to the aircraft constituted a reportable occurrence. Accidents and serious incidents that are reportable to the AAIB are defined in the Civil Aviation (Investigation of Air Accidents and Incidents) Regulations 1996, available on the AAIB website.

Safety action

The operators of Maypole Airfield stated that they would revise their website to take account of the correct definition of clearway.