

## Piper PA-28-181 Cherokee Archer II, G-BXWO

<b>AAIB Bulletin No: 11/2003</b>	<b>Ref: EW/G2003/08/39</b>	<b>Category: 1.3</b>
<b>Aircraft Type and Registration:</b>	Piper PA-28-181 Cherokee Archer II, G-BXWO	
<b>No &amp; Type of Engines:</b>	1 Lycoming O-360-A4M piston engine	
<b>Year of Manufacture:</b>	1981	
<b>Date &amp; Time (UTC):</b>	23 August 2003 at 0821 hrs	
<b>Location:</b>	Redhill Airfield, Surrey	
<b>Type of Flight:</b>	Private	
<b>Persons on Board:</b>	Crew - 2	Passengers - 2
<b>Injuries:</b>	Crew - None	Passengers - None
<b>Nature of Damage:</b>	Right main landing gear collapsed	
<b>Commander's Licence:</b>	Private Pilot's Licence	
<b>Commander's Age:</b>	47 years	
<b>Commander's Flying Experience:</b>	64 hours (of which 1 was on type)	
	Last 90 days - 3 hours	
	Last 28 days - 0 hours	
<b>Information Source:</b>	Aircraft Accident Report Form submitted by the pilot	

### Synopsis

Prior to taking off, the aircraft's weight and balance was determined to have been just below the maximum authorised take-off weight, and just inside the aft limit for the centre of gravity position. During the takeoff, the acceleration was seen to be slow and the aircraft 'struggled' into the air in a nose high attitude. At a height of approximately 50 feet, an un-commanded reduction in engine power occurred and the aircraft landed heavily on the right main landing gear, which broke off.

### History of the flight

The aircraft was one of a group of ten on a trip from several different airfields in the UK to Biarritz, France. The accident aircraft was planned to depart Redhill, Surrey for Deauville, France with four occupants, a limited amount of baggage and 70% full fuel load. Three of the aircraft occupants were qualified pilots, and the pilot occupying the right seat held a commercial licence. The three pilots shared the various tasks involved in preparing for the trip and planned to share the flying sectors to and from Biarritz. For the departure from Redhill one of the non-handling pilots prepared a weight and balance calculation which showed that the aircraft was 21 lb under the aircraft's maximum take-off weight of 2,550 lb, and the centre of gravity was 92.88 inches aft of datum, or 0.12 of an inch inside the aft limit. As the two front seat pilots walked out to board the aircraft, they agreed that the more experienced right seat pilot would take control in the event of any major emergency.

The aircraft started up and taxied for grass Runway 26 L. The weather was fine with a wind of about 360°/10 kt and, whilst the aircraft was taxiing, ATC asked the pilot if he would prefer to use Runway 01 for takeoff. The commander and the right seat pilot discussed the offer, but decided to use Runway 26 L, because of the flatter ground and fewer obstacles beyond the far end of the runway, and an extra 46 metres take-off run available on that runway. Whilst the aircraft was taxiing, the ATC controller noticed that the aircraft was in an unusually nose up attitude with the nose oleo almost fully extended.

All engine indications during the run up checks were normal, and the pilot applied full power with the brakes set before beginning the take-off roll. Acceleration was slow, but about half way down the runway the aircraft lifted off. The ATC controller, who watched the takeoff, described the aircraft 'struggling' into the air and maintaining the nose high attitude that he had earlier noticed whilst the aircraft taxied. At an estimated 50 feet above the ground both front seat pilots noticed a reduction in engine RPM and, almost immediately, the stall warning sounded and the right wing dropped as the commander tried to maintain a climbing attitude. Recognising that the aircraft would not be able to climb clear of obstacles, the right seat pilot took control, closed the throttle, lowered the nose and positioned the aircraft to land straight ahead. The aircraft landed heavily on the right main landing gear, which collapsed and detached from the aircraft as it came to a halt just beyond the airfield perimeter track. All the occupants vacated the aircraft through the normal exit, uninjured.

Some days after the accident the engineering company that normally maintained the aircraft carried out an aircraft examination. No fault could be found with the engine that could have explained the loss of power just after takeoff. However, the engine primer pump was found unlocked. Full power engine runs carried out by the engineering company revealed that with the primer unlocked the maximum rpm attainable reduced by 100 RPM. The pilots reported that the engine primer pump had not been used during the engine start on the day of the accident.