

**ACCIDENT**

<b>Aircraft Type and Registration:</b>	RAF 2000 GTX-SE, G-HOWL	
<b>No &amp; Type of Engines:</b>	1 Subaru EJ22 piston engine	
<b>Year of Manufacture:</b>	1997	
<b>Date &amp; Time (UTC):</b>	31 March 2007 at 1220 hrs	
<b>Location:</b>	Eddsfield Airfield, North Yorkshire	
<b>Type of Flight:</b>	Private	
<b>Persons on Board:</b>	Crew - 1	Passengers - None
<b>Injuries:</b>	Crew - 1	Passengers - N/A
<b>Nature of Damage:</b>	Cockpit, rotor, propeller, undercarriage and mast damaged	
<b>Commander's Licence:</b>	Private Pilot's Licence	
<b>Commander's Age:</b>	60 years	
<b>Commander's Flying Experience:</b>	1,017 hours (of which 207 were on type) Last 90 days - 14 hours Last 28 days - 7 hours	
<b>Information Source:</b>	Aircraft Accident Report Form submitted by the pilot	

**Synopsis**

The aircraft experienced a high rate of descent during a downwind takeoff and impacted the ground before the pilot was able to take corrective action.

**History of the flight**

The pilot had flown to Eddsfield, an unmanned grass airfield near the East Coast in North Yorkshire, where he landed and refuelled. Prior to his next flight he assessed the wind to be approximately 020°/7 kt. He decided to accept the slight tailwind component and use Runway 27 for takeoff, to avoid a 15 ft high hedge at the eastern end of the runway. Before takeoff he switched on the fuel pump, applied carburettor heat, span the rotor up to 200 rpm, selected carburettor heat off and

applied full throttle. He reported that the takeoff was normal and that the aircraft climbed rapidly to a height of approximately 160 ft. It then encountered a severe downdraft and descended rapidly. The pilot initially thought the engine had lost power but then saw an indicated airspeed of 50 mph and a normal full power engine speed of 5,220 rpm. He attempted to turn into wind but this resulted in an increased rate of descent.

The pilot turned the aircraft back onto its original westerly heading. This arrested the rate of descent, which nevertheless remained rapid and he attempted to land on the runway remaining ahead of him. The airspeed had reduced to approximately 30 mph but the

pilot did not notice the low speed warning light flashing. This warning light flashes when the airspeed falls below 46 mph.

At approximately 50 ft the pilot lowered the nose of the aircraft and partially closed the throttle resulting in an almost vertical descent. The aircraft impacted the ground on its left side in a shallow nose-down attitude, bounced and rolled to the right. The rotor and propeller were destroyed when the right hand side of the aircraft impacted the ground. The pilot was able to turn the ignition switch off with his foot and vacated the aircraft having sustained superficial head injuries.

#### **Airfield information**

Eddsfield Airfield has a single grass runway aligned east-west and is situated on high ground at the head of a shallow valley which slopes down from the airfield in the direction that G-HOWL took off. The airfield guide used by the pilot indicated that turbulence was possible from trees rising to 80 ft on the approach to Runway 27. A website which provided information about the airfield indicated that this runway was 800 m long with a takeoff run available (TORA) of 700 m and a landing distance available (LDA) of 775 m.

#### **Discussion**

The pilot considered that experiencing a high rate of descent after takeoff distracted him from monitoring his

airspeed. Although he attempted to increase airspeed by lowering the nose, his instinctive reaction to the aircraft approaching the end of the runway was to partially close the throttle. This prevented any increase in airspeed and led to the final vertical descent.

Pilots familiar with the RAF 2000 have stated that the minimum power required speed (MPRS)<sup>1</sup> for this aircraft with a single occupant and full fuel would be approximately 60 mph. The accident aircraft had decelerated to half this speed. At full power, the RAF 2000 fitted with the Subaru EJ22 engine was considered unlikely to maintain level flight at 30 mph and the reduction in the vertical component of lift during a turn would exacerbate the problem.

The angle of climb of any aircraft is reduced by a tailwind on takeoff.

#### **Conclusion**

The aircraft experienced a high rate of descent during a downwind takeoff. The pilot attempted to manoeuvre the aircraft and climb at an airspeed at which the aircraft was unlikely to be able to maintain height. Although the pilot lowered the nose in an attempt to recover the aircraft to stable flight, there was insufficient height remaining in which to do so before it impacted the ground.

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#### **Footnote**

<sup>1</sup> MPRS is equivalent to the best lift/drag speed and is also the best rate of climb speed for a gyroplane.