

## ACCIDENT

<b>Aircraft Type and Registration:</b>	DH82A Tiger Moth, G-ANMO	
<b>No &amp; Type of Engines:</b>	1 De Havilland Gipsy Major 1C piston engine	
<b>Year of Manufacture:</b>	1935 (Serial no: 3255)	
<b>Date &amp; Time (UTC):</b>	26 August 2021 at 0940 hrs	
<b>Location:</b>	Headcorn Aerodrome, Kent	
<b>Type of Flight:</b>	Training	
<b>Persons on Board:</b>	Crew - 2	Passengers - None
<b>Injuries:</b>	Crew - 2 (Minor)	Passengers - N/A
<b>Nature of Damage:</b>	Damage to landing gear, propeller, wings and fuselage	
<b>Commander's Licence:</b>	Private Pilot's Licence	
<b>Commander's Age:</b>	73 years	
<b>Commander's Flying Experience:</b>	21,154 hours (of which 770 were on type) Last 90 days - 29 hours Last 28 days - 5 hours	
<b>Information Source:</b>	Aircraft Accident Report Form submitted by the pilot and subsequent AAIB enquiries	

## Synopsis

During a flight to teach a qualified pilot to land on a short unlicensed grass strip, the aircraft was low and slow on short final. It contacted a tree followed by a power line, which was atop wooden pylons, before toppling to the ground onto its back. Both occupants were uninjured apart from a few scratches. The instructor was sat in the front cockpit where both the altimeter and airspeed indicator (ASI) were unserviceable, and his seating position meant that he had difficulty seeing the strut-mounted ASI and he did not have a clear forward view to offer appropriate instruction to the pilot flying (PF). This information was not communicated to the PF, nor were the PF's own concerns communicated to the instructor before or during the flight. As a consequence, several opportunities were lost, both on the ground and in the air, to discuss these before commencing or continuing the flight.

## Background

The instructor was teaching a qualified pilot (who was PF and with 21 hours on type in the previous 30 days) to take off and land on Runway 03 of the unlicensed grass strip (03/21) at the airfield (Figure 1). The instruction was a familiarisation flight to meet a requirement within the Aerodrome Operations Manual. Both the instructor and PF were instructors for the aircraft's operator and the instruction being given was conducted under the operator's training organisation approval (ATO).

To the north of the main grass strip (10/28), Runway 03 is used by biplanes when the crosswind component across Runway 10 is too strong. The use of this short grass strip (269 m) is restricted to pilots who have received instruction and have been formally checked out. The start of Runway 03 is 323 m north of a tree line and power lines (atop wooden pylons) that are either side of the road at the entrance to the airfield. The last third of the runway slopes gently towards a river on the northern boundary of the airfield, giving a foreshortened view of the runway on the approach.



**Figure 1**

Overview of airfield and approach to Runway 03

### History of the flight

The instructor and PF briefed the landing technique for about 5 minutes at the aircraft and about 10 minutes before engine start. There were time pressures on the instructor that morning and so he was keen to fly. The technique he taught was to be over the trees at 50-60 ft and 50 kt (5 kt below the normal approach speed and at least 15 kt above the stall speed) with some power and, when just clear of the trees, to close the throttle fully while at the same time easing the stick forward to maintain speed. Finally, the aircraft should be flared for a three-point landing where Runways 10/28 and 03/21 intersect. If the touchdown was delayed, given the runway's downward slope towards the river and the lack of brakes on the aircraft, then a go-around would be necessary.

So that the PF could familiarise himself with the unusual approach and foreshortened view of the runway they planned to go around from the first approach regardless.

In the forward cockpit, where the instructor was seated, there was an altimeter and ASI both of which were unserviceable. The PF's altimeter and ASI in the rear cockpit were both serviceable. The aircraft was equipped with a strut-mounted spring-operated ASI, but did not have leading-edge slats that, from the forward cockpit, can give visible clues that the aircraft is approaching the stall. The instructor was sitting on a parachute rather than the taller cushion in the rear cockpit that he was used to and had his head to one side to give

the PF “a better view.” However, this meant that the instructor’s perspective of the approach was compromised as well as the view of the strut-mounted ASI. The PF was aware that the front ASI was unserviceable but understood that the instructor used the strut-mounted ASI. However, he was unaware that the instructor did not have a good view of this and so was unable to monitor the airspeed.

The aircraft took off from Runway 03 and the wind during the flight (recorded by the weather station at the airfield) was from the north between 7 and 10 kt.

On the initial part of the first approach to Runway 03 the PF was told that the aircraft was too high and was instructed to “slip” off some height. The PF did this but felt uncomfortable with how low they then were but assumed, as he was under instruction, that this was the correct flight profile for landing. After the flight, observers on the ground advised the instructor that the aircraft had been low and, in his statement, he commented that he had “failed to notice” this.

The go-around appeared “OK” to the instructor, but he was unaware of the speeds flown.

During the downwind leg, the instructor commented to the PF on the initial high approach but seemed happy with the rest of descent profile. There was no discussion about airspeed.

For the second approach the instructor again told the PF they were too high so the PF sideslipped the aircraft slightly to the right to lose some height. The PF, feeling the aircraft was getting low checked the altitude on his instruments, and noted they were descending through 300 ft aal at 50 kt. He then turned his attention to the touchdown point. By the time the aircraft neared the trees, the airspeed had decayed to near stalling speed. The PF felt the aircraft sinking and applied full power. In the meantime, the instructor hadn’t noticed that the aircraft was again low but also slow over the trees. The aircraft then started to buffet, which is an indication of an approaching stall, so the instructor took control just as the left wingtip hit a tree and the tailskid caught the power line. The aircraft pitched down and hit the ground, with very little forward speed, on the undercarriage and the nose, and finally onto its back (Figure 2).

Both pilots were wearing a full harness and helmet and were uninjured apart from a few scratches. They were helped from the aircraft by witnesses and members of the airport fire service.

### **Pilots’ assessments**

The instructor stated that, having already checked the PF out to fly the Tiger Moth a few months earlier without any concern during “two very good flights”, he was complacent with his expectations of how the flight would proceed, particularly on the approach, even though the approach was “unusual” and of “high” workload. He noted that had the ASI in the front cockpit been serviceable and he “had taken a more normal position in the cockpit” the accident would have probably been avoided.



**Figure 2**

The aircraft with the trees and power line on the approach to Runway 03

The PF felt that briefing could have been more thorough given the fact that he had no experience of landing on Runway 03 and was totally reliant on the instruction given. He also did not feel comfortable with using the runway in the wind conditions, which he thought favoured Runway 28 on occasion. In hindsight he realised that he should have expressed and discussed his concerns, and perhaps rescheduled the flight for another day, rather than feeling “pressured to not waste time” given the instructor’s own time pressures that morning. Following the first (intentional) go-around, he felt the “approach was wrong” and that the instructor’s comments downwind did not reflect his own assessment of how it had been flown. He stated that, with the benefit of hindsight, he should have either handed control to the instructor or landed on Runway 28.

## Discussion

Both pilots failed to notice that they were too slow on the approach until the aircraft started to stall. By the time the aircraft was nearing the trees, the PF was focussed on looking out of the aircraft at the landing point, and no longer monitoring the airspeed on his cockpit ASI. He was, therefore, reliant on the instructor to say if the speed and position of the aircraft was wrong for the approach. The instructor was unaware of the reliance placed on him and given that his view of the approach and the strut-mounted ASI was compromised by his seating position, and with no serviceable altimeter or ASI in his cockpit, he was unable to monitor the progress of the approach and give effective instruction. The instrument unserviceabilities and compromised view would have been evident before the flight commenced and so this was an opportunity for the intended flight to have been rescheduled.

The instructor was also unaware of the PF's concerns about the flight, which in hindsight the PF stated that he should have voiced. As such, opportunities were lost, both on the ground and in the air, to discuss these to the satisfaction of both before commencing or continuing with the instructional flight.

The AAIB sought the opinion of another Qualified Flying Instructor regarding the technique for this approach. He advised that, although the approach is challenging, it is not difficult. He advises pilots new to this runway to come in high rather than fly the aircraft in under power (as this helps to avoid losing sight of the trees), and to aim to land as they cross the main 10/28 runway.