
AAIB Bulletin

1/2018

**TO REPORT AN ACCIDENT OR INCIDENT
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AAIB Correspondence Reports

These are reports on accidents and incidents which were not subject to a Field Investigation.

They are wholly, or largely, based on information provided by the aircraft commander in an Aircraft Accident Report Form (AARF) and in some cases additional information from other sources.

The accuracy of the information provided cannot be assured.

SERIOUS INCIDENT

Aircraft Type and Registration:	Airbus A319-111, G-EZAW	
No & Type of Engines:	2 CFM 56-5B5/P turbofan engines	
Year of Manufacture:	2006 (Serial no: 2812)	
Date & Time (UTC):	3 July 2017 at 1931 hrs	
Location:	Munich Airport, Germany	
Type of Flight:	Commercial Air Transport (Passenger)	
Persons on Board:	Crew - 6	Passengers - 149
Injuries:	Crew - None	Passengers - None
Nature of Damage:	Damage to the nose and right main landing gear	
Commander's Licence:	Airline Transport Pilot's Licence	
Commander's Age:	41 years	
Commander's Flying Experience:	11,179 hours (of which 9,300 were on type) Last 90 days - 192 hours Last 28 days - 35 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot and further enquiries by the AAIB	

Synopsis

The aircraft was established on an ILS approach to Runway 26L at Munich Airport. When the aircraft was at about 1,500 ft aal, the commander's Flight Management Guidance Computer (FMGC)1 failed. The crew were unable to alter the target approach speed, and the engines began to spool up un-commanded. The pilot flying disconnected the autopilot and autothrust and the rest of the approach was flown manually. Below 50 ft the pitch attitude of the aircraft was reduced slightly just before the aircraft was flared for landing, and it touched down heavily in a relatively flat attitude. The normal acceleration recorded at touchdown was 3.01 g, which is classified as a Severe Hard Landing. All three landing gear legs were replaced, although subsequent examination revealed that only the nose and right main gear were damaged.

History of the flight

The aircraft was performing a scheduled passenger service between Edinburgh and Munich Airports. The co-pilot was pilot flying (PF). The aircraft was established on an approach to Runway 26L at Munich when, at about 1,500 ft aal, FMGC1 froze. Both flight crew attempted to alter the target approach speed but were unable to do so through either the FMGC or the Flight Control Unit. At 1,288 ft aal, the engines began to spool up un-commanded by the crew, so the autopilot (AP) and autothrust (A/THR) were disconnected by the PF. The rest of the approach was flown manually with manual thrust.

During the approach, a cabin pressure landing elevation fault was triggered, thought to be associated with the failure of FMGC1.

As the aircraft approached the touchdown point, the PF selected a lower-than-normal pitch attitude and the aircraft touched down firmly. The crew taxied the aircraft to the stand as normal but a LOAD<15> report¹ was printed automatically, indicating the aircraft had suffered a hard landing. Subsequent enquiries revealed the touchdown had resulted in a maximum recorded vertical acceleration of 3.01 g.

Aircraft information

Autothrust

When disconnecting the AP on the A319 to fly manually, the system is designed so that the A/THR can remain engaged because it offers protection against gusts and possible airspeed excursions. Although it is usual to fly the approach and landing with the A/THR engaged, the company Operations Manual requires it to be disconnected '*in case the PF is not satisfied with the A/THR operation*', and the operator considered disconnection of the A/THR to be an appropriate response to an un-commanded thrust increase.

Sidesticks

The aircraft is fitted with a sidestick for each pilot located outboard of the seating position. The sidesticks are not linked mechanically so the movement of one sidestick will not move the other. It can be difficult for one pilot to see the inputs of the other pilot because of the sidestick location.

LOAD <15> report

The A319 is fitted with a system that senses when landing parameters have been exceeded and generates a LOAD<15> report, following which the aircraft must be inspected for damage. A LOAD<15> report will automatically be sent to the aircraft printer and the operator's engineering centre during a landing if any of the following conditions are met:

- The normal acceleration is greater than 2.6 g at touchdown. If the aircraft weight exceeds the maximum landing gross weight, the normal acceleration is reduced to 1.7 g.
- The rate of descent on the radio altimeter is greater than 9 ft/sec at touchdown. If the aircraft weight exceeds the maximum landing gross weight, the radio altimeter descent rate is reduced to 6 ft/sec.
- During a bounced landing, the normal acceleration exceeds 2.6 g.

The normal acceleration data for the LOAD <15> report is provided by an accelerometer mounted near the aircraft's centre of gravity which also provides data for the flight data

Footnote

¹ Details of load report printing (LOAD<15>) contained in Aircraft information.

recorder (FDR). The output of the accelerometer is only recorded at a certain frequency which means that the maximum recorded normal acceleration may not always reflect the maximum actually attained. It also cannot measure the acceleration levels which may be experienced by other areas of the airframe such as the nose landing gear.

Aircraft examination

The aircraft was inspected for a Severe Hard Landing as required by the manufacturer's Aircraft Maintenance Manual. This inspection revealed damage to the nose landing gear and the right main landing gear as well as some cracking of the paint and sealant in the nose gear bay and avionics bay. The inspection showed there was no other damage to the aircraft.

On the advice of the manufacturer, all three landing gears on the aircraft were replaced and sent for detailed inspection. These inspections revealed that both the nose landing gear and the right main landing gear had suffered excessive loads during the landing and could not be returned to a serviceable condition. The nose landing gear shock-absorber cylinder was found buckled (Figure 1) with the barrel and forestay lower arm pin found to be out of tolerance. The right main landing gear sliding tube and shock-absorber were also found to be outside acceptable tolerances when measured. The left main gear was undamaged.

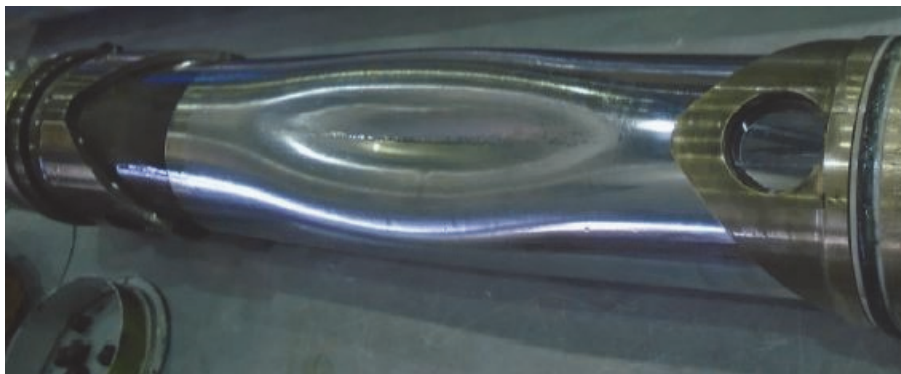


Figure 1

Nose landing gear shock absorber cylinder

Recorded flight data

The aircraft's FDR was removed from the aircraft, downloaded and the recordings analysed by the AAIB.

The data (Figure 2) shows the aircraft established on a stable ILS approach, correctly configured and at the approach speed. At 1,228 ft radio altitude, the AP and A/THR were disconnected. As the aircraft approached 30 ft radio altitude, there was a forward sidestick input and the pitch attitude began to decrease. The aircraft reached close to 1° nose-down less than a second before touchdown. At around 10 ft radio altitude, the PM applied a small amount of aft stick but this had a negligible effect on the pitch attitude and touchdown.

The LOAD <15> report showed that, at touchdown, the aircraft's attitude was 0.7° nose-down with a slight roll to the right, and its rate of descent was 11.9 ft/sec. The maximum recorded vertical acceleration was 3.01 g.

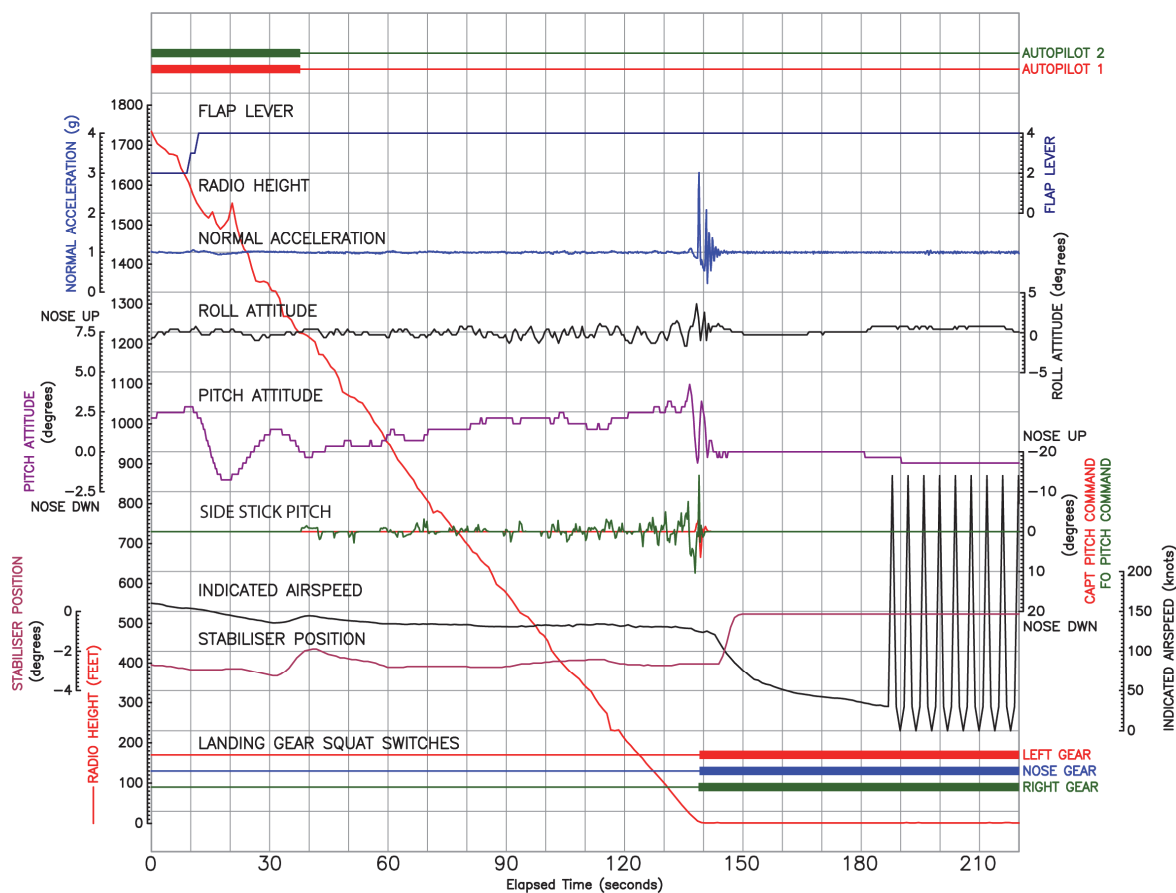


Figure 2

Salient FDR parameters for the approach and touchdown

Meteorology

The weather report for Munich at 1920 hrs showed a surface wind of 290°M at 2 kt, CAVOK, temperature 20°C, dewpoint 10°C and pressure 1022 hPa. There was no significant change between 1920 hrs and 1950 hrs.

Sunset at Munich Airport was at 1916 hrs with the end of civil twilight² at 1957 hrs. The aircraft landed in the period of civil twilight which, under EASA rules, is defined as daylight.

Footnote

² Civil twilight is defined as the period at sunrise and sunset when the sun's centre is between 0° 50' and 6° below the horizon.

Airfield information

After receiving radar vectors to the approach, the aircraft was cleared for an ILS approach to Runway 26L. The runway has a full set of approach lights which were illuminated, including a standard approach light system, touchdown zone lights, sequenced flashing lights and PAPI set at 3°. There is no displaced threshold. The runway is 4,000 m long and 60 m wide, and slopes down by 0.1°.

Personnel

The co-pilot had just over two years flying experience with the operator during which he had completed 1,644 hours flying on Airbus A320 series aircraft.

The commander was initially dealing with the failure of FMGC1 and the cabin pressure landing elevation fault and, from his perspective, the aircraft was on a normal stable approach. He did not notice any nose-down control inputs because he was concentrating on the runway and touchdown point. Approximately 0.5 seconds before touchdown, the commander called out “watch it”, as he detected the aircraft was not in the usual attitude for landing, but the aircraft had touched down before he had time to react in any way which might have altered the outcome.

Analysis

The aircraft was established on a standard approach to Munich Airport in good weather and light winds. At around 1,500 ft aal, FMGC1 froze. Because of the perceived misbehaviour of the failed FMGC, including the un-commanded increase in thrust, the PF disconnected both the AP and A/THR and flew the approach manually. This would have increased his workload, as would the distraction caused by the FMGC failure and cabin pressure landing elevation fault.

As the aircraft passed through 30 ft radio altitude, there was a nose-down sidestick input which lowered the pitch attitude of the aircraft. The commander did not notice the control input because he was looking ahead and did not notice the abnormal landing attitude until it was too late to act effectively. The touchdown was flat or slightly nose-down with a rate of descent high enough to damage the right main and nose landing gear.

The reason for the nose-down sidestick input could not be determined but it was possible that a combination of the distractions caused by the FMGC1 failure with the higher workload of flying the aircraft with the A/THR disconnected had a contributory effect.

Conclusion

Following an ILS approach during which an FMGC failed, neither pilot realised that the aircraft was in the incorrect attitude for landing until it was too late to take corrective action. As a result, the aircraft landed heavily causing damage to the nose and right main landing gear. It is possible that distractions and high workload during the approach contributed to the nose-down pitch input being made immediately before touchdown.

SERIOUS INCIDENT

Aircraft Type and Registration:	Britten-Norman Islander BN2B-26, VP-FBR	
No & Type of Engines:	2 Lycoming O-540-E4C5 piston engines	
Year of Manufacture:	1992	
Date & Time (UTC):	4 September 2017 at 1147 hrs	
Location:	9 nm south of Mount Pleasant Airport, Falkland Islands	
Type of Flight:	Commercial Air Transport (Passenger)	
Persons on Board:	Crew - 1	Passengers - 2
Injuries:	Crew - None	Passengers - None
Nature of Damage:	Left engine failure, small hole in top cowling	
Commander's Licence:	Commercial Pilot's Licence	
Commander's Age:	25 years	
Commander's Flying Experience:	2,310 hours (of which 2,130 were on type) Last 90 days - 66 hours Last 28 days - 27 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot	

Approximately 10 minutes after takeoff the commander heard a loud "bang", which was accompanied by strong vibration and white smoke was seen emanating from the left engine. He shut down the engine in accordance with the emergency procedure and commenced a shallow dive to increase airspeed until the smoke had ceased. A MAYDAY was declared and the aircraft returned to Mount Pleasant Airport where it landed without further incident.

Initial inspection found a hole in the left engine top cowling. When the cowling was removed, a hole in the crankcase and some liberated internal engine parts were apparent (Figure 1).

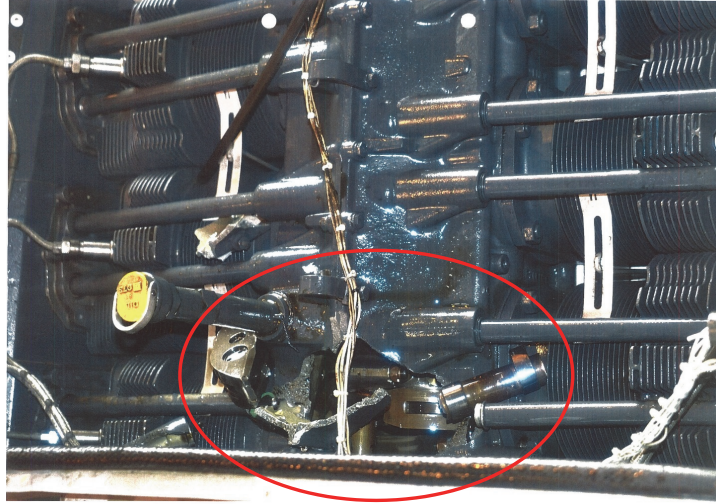


Figure 1

View of top of left engine showing hole in crankcase and liberated parts

ACCIDENT

Aircraft Type and Registration:	Cessna 152, G-BKAZ
No & Type of Engines:	1 Lycoming O-235-L2C piston engine
Year of Manufacture:	1979 (Serial no: 152-82832)
Date & Time (UTC):	14 September 2017 at 1500 hrs
Location:	Perth Aerodrome, Perthshire
Type of Flight:	Training
Persons on Board:	Crew - 1 Passengers - None
Injuries:	Crew - None Passengers - N/A
Nature of Damage:	Propeller strike, engine frame and firewall distortion
Commander's Licence:	Student pilot
Commander's Age:	34 years
Commander's Flying Experience:	61 hours (of which 60 were on type) Last 90 days - 38 hours Last 28 days - 11 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot

Synopsis

A student pilot had carried out a short solo cross-country flight and returned to Perth Aerodrome. Just prior to touchdown the aircraft drifted slightly off the centre line, which the pilot attempted to correct but the aircraft landed heavily and bounced. During the landing the aircraft sustained damage to the propeller, engine frame and firewall.

History of the flight

A student pilot had completed a short solo cross-country flight and was returning to Perth Aerodrome. He carried out an overhead join and as he turned onto finals it started to rain which reduced the visibility. He continued with his approach for landing. However, just prior to touchdown, a crosswind caused the aircraft to drift off the centre line, which he tried to correct. The aircraft then landed heavily and bounced. The pilot taxied the aircraft back to the parking area but noted whilst taxiing, that the rudder "was not operating properly". It became apparent the aircraft had sustained a propeller strike and damage had been caused to the engine frame and firewall.

Discussion

The pilot was of the opinion that the wind direction had changed in the "last moments" of his final approach and that "a sudden windshear" unexpectedly increased his rate of descent resulting in a touchdown sooner than he expected.

His instructor had flown twice with the student on the same day including a circuit in a “stiff” crosswind which he considered the student had handled well. The instructor had no doubts about the student’s ability to carry out the flight as planned and had briefed him on the possibilities of variable wind conditions and localised showers. The instructor was of the view that the propeller strike and frame damage had occurred after the bounced landing.

ACCIDENT

Aircraft Type and Registration:	Cessna 182T, N60554	
No & Type of Engines:	1 Lycoming IO-540-AB1A5 Piston Engine	
Year of Manufacture:	2006	
Date & Time (UTC):	28 August 2017 at 1640 hrs	
Location:	Private airstrip, near Stockbridge, Hampshire	
Type of Flight:	Private	
Persons on Board:	Crew - 1	Passengers - None
Injuries:	Crew - None	Passengers - N/A
Nature of Damage:	Damaged beyond economic repair	
Commander's Licence:	Private Pilot's Licence (Federal Aviation Administration, USA)	
Commander's Age:	64 years	
Commander's Flying Experience:	1,329 hours (of which 950 were on type) Last 90 days - 27 hours Last 28 days - 5 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot and further enquires by the AAIB	

Synopsis

Following a hard landing, the aircraft departed from the prepared section of a narrow grass airstrip, the pilot lost control and the aircraft spun around its nose.

History of the flight

Visibility was good and there appeared to be a light southerly breeze when the pilot arrived overhead this private grass airstrip, which is almost entirely surrounded by trees and has rising ground to the east. The pilot had not landed there previously, so two practice approaches and go-arounds were flown to Runway 18 before the pilot approached, with the aim of clearing the obstacles to the north and landing a short way along the 700 m strip. The aircraft touched down "hard" and the pilot immediately lost control as the aircraft deviated off the runway into an area of longer grass and soft ground (Figure 1). The left wing tip and the propeller struck the ground and the aircraft spun around its nose before coming to rest upright, facing towards the north-east. The pilot noted that the motion did not feel excessively violent and observed that the airbags fitted to the aircraft were not triggered. No injury was sustained by the pilot, who was able to open the door and step out of the aircraft without difficulty.

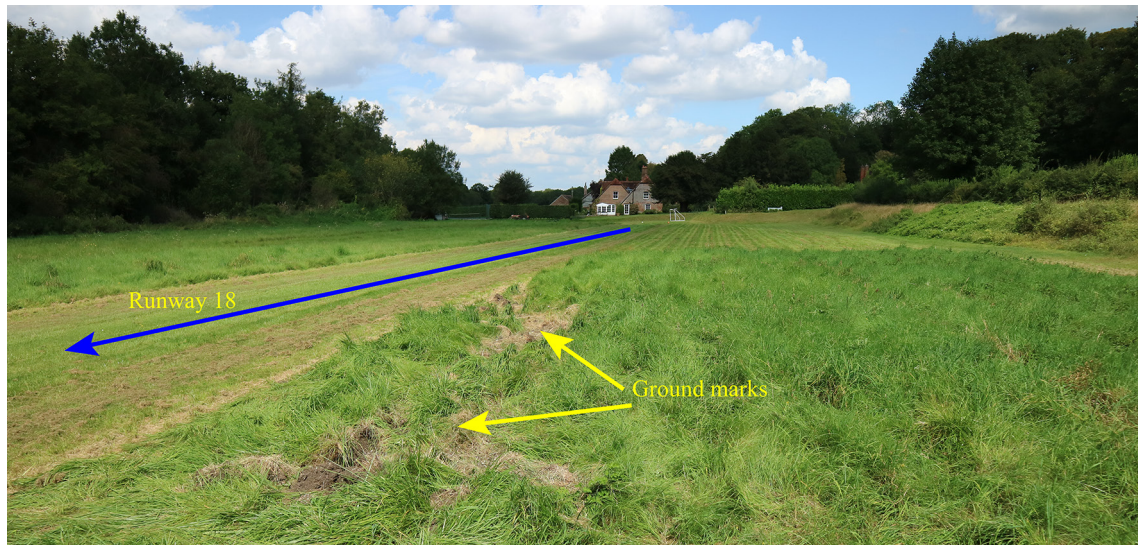


Figure 1

A northerly view of Runway 18.

Note the trees and buildings to the north of the airstrip, on the approach to Runway 18

Other information

Photographs taken after the accident indicated the grass airstrip had been cut to a width of approximately eight metres. An engineer who examined the aircraft found evidence that the left mainwheel deviated into long grass on the left side of the strip before the left wing and the propeller struck the ground. This caused the aircraft to spin around to the left quickly and shock-loaded the engine and the airframe. Both wings were damaged, the fuselage was distorted and the nose and right main landing gear legs were detached, while the left main landing gear collapsed (Figure 2).



Figure 2

A southerly view along Runway 18, showing the aircraft pointing to the north-east, with the left wing severely damaged and with a tarpaulin over the rear fuselage

AAIB Comment

The CAA's Safety Sense Leaflet 12 titled '*Strip Flying*' contains guidance for pilots who intend to fly to an unfamiliar airstrip. It suggests that the best way for a pilot to understand the constraints of an unfamiliar airstrip is by first visiting in the company of a pilot who has prior experience of operating from there.

ACCIDENT

Aircraft Type and Registration:	Diamond DA42 Twin Star, G-OCCX	
No & Type of Engines:	2 Thielert TAE 125-02-99 piston engines	
Year of Manufacture:	2006 (Serial no: 42.155)	
Date & Time (UTC):	22 August 2017 at 1528 hrs	
Location:	Coventry Airport	
Type of Flight:	Training	
Persons on Board:	Crew - 2	Passengers - None
Injuries:	Crew - None	Passengers - N/A
Nature of Damage:	Damage to both propellers and engines, the underside of the fuselage, antennas and entry steps	
Commander's Licence:	Airline Transport Pilot's Licence	
Commander's Age:	74 years	
Commander's Flying Experience:	15,100 hours (of which 25 were on type) Last 90 days - 52 hours Last 28 days - 17 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot	

On returning to Coventry Airport, after conducting upper air exercises as part of the first sortie of a Multi-Engine Piston Flight Instructor's course, the pilot under training who was flying the aircraft was introduced to asymmetric handling of the aircraft. During this time, as one engine was operated at 10% of engine load to give zero thrust, the landing gear warning horn sounded continuously. The pilot under training then joined right base for a flapless landing on Runway 05 with the engine still set at zero thrust. Although, the commander believed that he had verified the landing gear was down, the aircraft was subsequently landed gear-up.

The commander noted that the landing gear warning horn had been operating for the 10 minutes prior to the landing and, having grown accustomed to the sound, that this may have led to his failure to recognise that the landing gear was not down.

ACCIDENT

Aircraft Type and Registration:	Mooney M20J, G-OBAL	
No & Type of Engines:	1 Lycoming IO-360-A3B6D piston engine	
Year of Manufacture:	1988 (Serial no: 24-1601)	
Date & Time (UTC):	15 September 2017 at 1421 hrs	
Location:	Elstree Aerodrome, Hertfordshire	
Type of Flight:	Private	
Persons on Board:	Crew - 1	Passengers - 1
Injuries:	Crew - None	Passengers - None
Nature of Damage:	Damage to propeller and right main landing gear door	
Commander's Licence:	Light Aircraft Pilot's Licence	
Commander's Age:	59 years	
Commander's Flying Experience:	98 hours (of which 14 were on type) Last 90 days - 16 hours Last 28 days - 5 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot	

The pilot was flying from Gloucester Airport to Elstree Aerodrome with a colleague. He reported that the circuit was normal, but considered he was too high on final approach. Adjustments prior to landing caused the aircraft to touch down too fast, resulting in it bouncing twice. The pilot aborted the landing and proceeded to go around.

On the second attempt, the aircraft bounced again, so the pilot performed another go-around. During the climb out the air traffic controller informed the pilot that the propeller may have contacted the runway. The pilot broke off the third approach, but successfully landed the aircraft on the fourth attempt.

Examination of the aircraft revealed damage to the propeller and right main landing gear door.

ACCIDENT

Aircraft Type and Registration:	Nipper T.66 RA45 Series 3, G-AVKI	
No & Type of Engines:	1 Sauer SE 1800 E2S piston engine	
Year of Manufacture:	1967 (Serial no: S102)	
Date & Time (UTC):	17 October 2017 at 1320 hrs	
Location:	RAF Henlow, Bedfordshire	
Type of Flight:	Private	
Persons on Board:	Crew - 1	Passengers - None
Injuries:	Crew - None	Passengers - N/A
Nature of Damage:	Damage to propeller, wings, engine cowling and rudder. Damage to hangar door	
Commander's Licence:	National Private Pilot's Licence	
Commander's Age:	51 years	
Commander's Flying Experience:	703 hours (of which 2 were on type) Last 90 days - 53 hours Last 28 days - 23 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot	

The pilot was stowing the aircraft's restraining strap and chocks in the cockpit with the engine at idle. As he leaned into the cockpit to secure them for flight, he inadvertently advanced the throttle, causing the aircraft to move forward under its own power. The pilot attempted to stop the aircraft by holding onto the left wing. He was able to guide it onto a grassed area adjacent to the hangars, but was unable to bring it to a stop. The aircraft then completed approximately three full rotations before the pilot was forced to let go; it then continued forward until it struck the hangar doors and came to a stop.

ACCIDENT

Aircraft Type and Registration:	Piper PA-25-235 Pawnee, G-BCBJ	
No & Type of Engines:	1 Lycoming O-540-B2C5 piston engine	
Year of Manufacture:	1963 (Serial no: 25-2380/R)	
Date & Time (UTC):	28 October 2017 at 0910 hrs	
Location:	Aboyne Airfield, Aberdeenshire	
Type of Flight:	Private	
Persons on Board:	Crew - 1	Passengers - None
Injuries:	Crew - None	Passengers - N/A
Nature of Damage:	Damage to propeller	
Commander's Licence:	Light Aircraft Pilot's Licence	
Commander's Age:	74 years	
Commander's Flying Experience:	14,100 hours (of which 75 were on type) Last 90 days - 3 hours Last 28 days - 2 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot	

The pilot was taxiing the aircraft from Runway 09N towards Runway 09S in a strong crosswind. He reported that, as the aircraft approached the end of the taxiway, a gust caused it to yaw to the right and pitch forward simultaneously. He closed the throttle and applied full rearward deflection of the control column but the tail continued to rise causing the propeller to strike the ground.

ACCIDENT

Aircraft Type and Registration:	Piper PA-28-140 Cherokee, G-BCJM	
No & Type of Engines:	1 Lycoming O-320-D3G piston engine	
Year of Manufacture:	1974 (Serial no: 28-7425321)	
Date & Time (UTC):	28 August 2017 at 1030 hrs	
Location:	Near Parbold, Lancashire	
Type of Flight:	Training	
Persons on Board:	Crew - 2	Passengers - None
Injuries:	Crew - None	Passengers - N/A
Nature of Damage:	Left flap buckled and left stabilator tip fairing damaged	
Commander's Licence:	Private Pilot's Licence	
Commander's Age:	53 years	
Commander's Flying Experience:	972 hours (of which 700 were on type) Last 90 days - 106 hours Last 28 days - 64 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot	

The aircraft departed Liverpool Airport for a training flight and, during the first 15 minutes, two practice engine failures were completed. Then, at approximately 2,300 ft while climbing with maximum engine rpm set, power suddenly reduced and the instructor took control and adopted a glide attitude. With the fuel pump already switched ON and mixture RICH, the other fuel tank was selected and the carburettor heat was set to HOT, but the engine rpm did not recover.

A suitable field was selected, a distress call was made and the engine was secured; the propeller continued to windmill until the aircraft was flared for landing. After touchdown the instructor spotted a low fence ahead and briefly lifted the aircraft off the ground again and "hopped" over the fence.

During the subsequent ground roll several sheep ran in front of the aircraft and one was hit, causing the damage shown in Figures 1 and 2. The aircraft was stopped close to a second fence and the electrics and fuel were then turned OFF before the crew exited through the door. Some unidentified debris was later found in the carburettor but the examining engineer was unsure if this was sufficient to have caused the engine failure.



Figure 1
Damage to left flap



Figure 2
Damage to tip of left stabilator

ACCIDENT

Aircraft Type and Registration:	Piper PA-28RT-201, N2136E	
No & Type of Engines:	1 Lycoming IO-360-C1C6 piston engine	
Year of Manufacture:	1978 (Serial no: 28R-7918002)	
Date & Time (UTC):	22 July 2017 at 1350 hrs	
Location:	Sandtoft Airfield, Lincolnshire	
Type of Flight:	Private	
Persons on Board:	Crew - 1	Passengers - 3
Injuries:	Crew - None	Passengers - None
Nature of Damage:	Extensive	
Commander's Licence:	Private Pilot's Licence	
Commander's Age:	56 years	
Commander's Flying Experience:	791 hours (of which 236 were on type) Last 90 days - 10 hours Last 28 days - 3 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot	

Synopsis

The aircraft suffered an electrical failure after the electrically actuated landing gear had been selected DOWN but was still in transit. The aircraft landed with the landing gear unlocked.

History of the flight

Approximately 45 minutes into a local flight from Sandtoft Airfield, a passenger became unwell and the pilot initiated a return to land. The pilot was in radio contact with Sandtoft and informed them of his intention to make a straight-in approach to Runway 23.

Approximately five miles from the airfield, landing checks were initiated, the landing gear was selected DOWN and, two to three seconds later, the aircraft lost all electrical power. The pilot checked the circuit breakers, which were all in. He was concerned that any faulty electrical circuit may still be live and could cause a fire. He could see Sandtoft and elected to continue with his plan even though the radio had stopped working following the power failure. There were no gear down light indications but the landing gear lever was in the DOWN position. The approach was normal until the propeller struck the ground after which the aircraft slid to a halt on the runway. The electrical master switch was set to OFF and the fuel set to CUT-OFF before the aircraft stopped. The four occupants evacuated without injury.

The landing gear is electrically actuated and it is most probable that it had not locked down before the failure occurred. The fault was traced to a faulty Battery Master switch.

ACCIDENT

Aircraft Type and Registration:	Piper PA-32R-301 Saratoga SP, G-RIGH	
No & Type of Engines:	1 Lycoming IO-540-K1G5 piston engine	
Year of Manufacture:	1998 (Serial no: 3246123)	
Date & Time (UTC):	28 August 2017 at 1016 hrs	
Location:	Faversham Road, Seasalter, Kent	
Type of Flight:	Private	
Persons on Board:	Crew - 1	Passengers - 5
Injuries:	Crew - None	Passengers - None
Nature of Damage:	Right landing gear detached, propeller bent and right side skin damage	
Commander's Licence:	Commercial Pilot's Licence	
Commander's Age:	34 years	
Commander's Flying Experience:	303 hours (of which 4 were on type) Last 90 days - 20 hours Last 28 days - 11 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot	

In the cruise, during his second flight of the day, the pilot reported that he noticed the alternator light was lit. Attempts to troubleshoot the problem did not resolve it and electrical systems progressively failed, also affecting engine indications. He briefed his passengers and elected to carry out a forced landing in a field. The touchdown was hard and the pilot reported that the right wheel "stuck in the mud" before the landing gear detached. There were no injuries.

In hindsight, the pilot stated that he could have landed safely at an airfield but that the number of problems being presented to him restricted his thinking and mental capacity. The CAA publication Safety Sense Leaflet 23, '*Pilots – it's your decision*' provides some information on human performance limitations. There is a significant amount of published information regarding human factors, highlighting the decision making limitations we can suffer under high workload situations.

ACCIDENT

Aircraft Type and Registration:	Piper PA-32R-301T, N414AG	
No & Type of Engines:	1 Lycoming T10-540-AH1A piston engine	
Year of Manufacture:	2000 (Serial no: 3257184)	
Date & Time (UTC):	23 August 2017 at 0827 hrs	
Location:	5 miles south of Linton-on-Ouse Airfield	
Type of Flight:	Private	
Persons on Board:	Crew - 1	Passengers - None
Injuries:	Crew - None	Passengers - N/A
Nature of Damage:	Extensive	
Commander's Licence:	Commercial Pilot's Licence	
Commander's Age:	63 years	
Commander's Flying Experience:	3,088 hours (of which 1,904 were on type) Last 90 days - 188 hours Last 28 days - 56 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot	

Synopsis

The engine failed when heavy rain was encountered while flying in sight of the ground at approximately 1,900 ft agl. A forced landing was made in a field but, before the aircraft came to a halt, it hit trees and was extensively damaged.

History of the flight

The pilot was flying in a northerly direction from Retford (Gamston) Airport towards Bagby (Thirsk) Airfield and the forecast weather was for rain showers and a consequential reduction in visibility to six kilometres. As the aircraft approached York, in Instrument Meteorological Conditions (IMC), the pilot encountered rain and observed on his Stormscope¹ a large number of returns from precipitation close to his route. He reduced power and descended to 2,000 ft amsl (approximately 1,900 ft agl) but, once below cloud and in sight of the surface, the rain became extremely heavy. While he was levelling (he was unsure if he had begun to increase the power or not), the engine suddenly stopped and the propeller then windmilled.

No unusual noises were apparent before the engine stopped and it did not "cough", as it might when starved of fuel, but the pilot immediately switched to the right fuel tank and turned-on the electric fuel pump. He also cycled the magneto switch and adjusted the mixture before switching back to the left fuel tank, which contained more fuel. None of these

Footnote

¹ A Stormscope provides a pilot with information about weather hazards.

actions restarted the engine so he selected the alternate air intake source while establishing the aircraft in a glide, with 10° of flap extended for the optimum glide angle. When the engine still did not restart, he re-selected the primary air source and, passing approximately 1,000 ft agl, he chose a group of small fields to aim towards. He could see there were cattle in these fields and therefore assumed they would be relatively flat and not furrowed.

During his descent the pilot was in radio contact with RAF Linton-on-Ouse and when he declared an emergency he was asked to select the emergency code 7700 on his transponder. He started to do this before realising that he ought to keep his attention outside, where he estimated that the slant visibility was approximately 3,000 m. He continued towards his chosen fields on a northerly heading, aware that the estimated wind at ground level was five knots from the southeast but thought it better to accept a tailwind than to look for an alternative landing site.

Approximately 200 ft above the chosen field he selected the landing gear down and full flap, maintaining a relatively fast airspeed to avoid stalling; he had read of this happening to other pilots when on final approach for a forced landing. He also managed to reach across the cockpit and release the door catch. He wanted to jam the door open with an available object but this proved impracticable from the left seat.

As the pilot flared the aircraft he retracted the flaps to try to improve the braking action on wet grass, and he turned off the master switch. The touchdown and ground roll felt relatively gentle and it became apparent that the aircraft was going to pass through an old hedge line consisting of numerous trees and bushes. The pilot steered towards a gap between two trees but the right wing and associated landing gear detached upon impact with one of the trees (Figure 1). The outboard section of the left wing also hit a tree and sustained damage, but without detaching from the fuselage. The aircraft then skidded across the adjoining field, losing the left main landing gear leg in the process. However, the nosewheel steering was still effective and the pilot used this to direct the aircraft between two ponds which he spotted ahead.



Figure 1

Detached right wing with trees which the aircraft hit in the background

The aircraft came to a halt approximately one metre from the edge of one of the ponds (Figure 2) and the pilot, who was uninjured, escaped through the door without difficulty. He checked the left wing tank and estimated it still held 25 gallons of fuel but the tank in the right wing had burst and he was unable to determine how much fuel it contained at touchdown.



Figure 2

Final position of N414AG close to the pond

Engineering inspection

Several days after the accident, engineers inspected the engine and noted the paper air filter element was swollen and puffy, indicating that it had been very wet but had begun to dry out. The air filter was replaced and the engine subsequently started and ran normally. It was assessed that the extremely heavy rain had caused the paper element in the air filter to become saturated with water and this had starved the engine of air.

The alternate air source bypasses the air filter and the engineers suggested that, had it been selected before the primary source became blocked, the engine may have continued to run. The pilot has since heard anecdotal evidence from another pilot who believed that his aircraft's air filter was partially blocked by water while in heavy rain but, although his engine ran roughly, it did not stop. When this pilot opened the alternate air source, the engine immediately recovered.

AAIB comment

In 2010, the engine manufacturer wrote a 'Tech Tips' document appertaining to its range of general aviation aircraft engines and included the following generic statement concerning piston engines:

'Several years ago, there was a reported loss of engine power in heavy rain. In that case, a paper air filter was being used. When saturated with water, the paper filter element became swollen so that airflow was impeded. In this case, the use of carburettor heat to bypass the filter and re-leaning to achieve a better fuel/air mixture were successful tactics that kept the aircraft flying until

a safe, on-airport landing could be made. We should keep in mind that it is not the ingestion of water through the engine that causes a serious loss of power; it is the reduced airflow.'

It should be noted that the accident described in this report concerned an aircraft with a turbo-charged engine which was not fitted with carburettor heat control.

ACCIDENT

Aircraft Type and Registration:	Piper PA-34-200T Seneca II, G-BPXX	
No & Type of Engines:	2 Continental Motors Corp TSIO-360-EB piston engines	
Year of Manufacture:	1979 (Serial no: 34-7970069)	
Date & Time (UTC):	13 October 2017 at 0800 hrs	
Location:	Sherburn-in-Elmet Aerodrome, West Yorkshire	
Type of Flight:	Private	
Persons on Board:	Crew - 1	Passengers - 2
Injuries:	Crew - None	Passengers - None
Nature of Damage:	Damaged beyond economic repair	
Commander's Licence:	Private Pilot's Licence	
Commander's Age:	65 years	
Commander's Flying Experience:	3,036 hours (of which 1,442 were on type) Last 90 days - 50 hours Last 28 days - 14 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot	

Synopsis

The pilot rejected the takeoff after encountering resistance when trying to move the control column to initiate rotation. Despite maximum braking, the aircraft overran the asphalt runway and traversed a level grass area before the left main landing gear collapsed while crossing a patch of rough ground. All three occupants escaped uninjured after the aircraft stopped against a hedge.

History of the flight

At 70 kt IAS during the takeoff roll on Runway 28, the pilot applied rearwards pressure to the control column but the aircraft did not rotate as expected. At 80 kt IAS, he applied increased pressure but the aircraft still did not respond, so he selected idle power and depressed the toe brakes. He later estimated that the IAS was close to 90 kt when he started to reject his attempted takeoff.

Despite application of maximum braking, the aircraft overran the runway and then ran across approximately 200 m of short grass before encountering a patch of rough ground, where the left main landing gear collapsed. The aircraft continued moving over a disused area of concrete and the pilot kept it straight with continued, full application of the right brake pedal. It eventually came to a halt, after impacting a hedge at an estimated groundspeed of two or three knots, and the three occupants exited without injury.

After the accident the pilot photographed tyre marks left by the mainwheels on the asphalt runway during braking. These marks began approximately 100 m prior to the end of the runway and indicate that the aircraft remained on the centreline until it departed the paved surface. The pilot had earlier calculated that the factored¹ takeoff ground roll required for the aircraft, which was at maximum takeoff weight, was 600 m while the takeoff run available was 799 m.

Pilot's assessment

From experience, the pilot estimated that in similar circumstances his aircraft normally rotated after a ground run of approximately 500 m. He believed that 4-5 seconds elapsed after his initial attempt to rotate until he first acted to reject the takeoff and that he had pulled the throttle levers back and was applying brake pressure with 120 m of runway remaining.

The pilot concluded that, as this was an operation from an unbalanced runway, he should have rejected the takeoff attempt immediately he realised the control response was not normal. By allowing the aircraft to continue to accelerate, and then making a further attempt to rotate, the available stopping distance was substantially reduced.

When the pilot examined the aircraft he found that the stabilator trim tab was at the fully nose-down position but the cockpit indication suggested it was positioned slightly nose-up, as required for takeoff. However, for his pre-flight external checks the pilot had set the indicator to the takeoff position and then verified that the tab was positioned appropriately. He then recalled that, after getting into the aircraft and commencing his internal preparations, he had noticed his front seat passenger, who is also a pilot qualified on-type, exercising the trim wheel fully in both directions. He had not seen any reason to challenge the passenger at the time and had, before departure, verified that the trim indicator was at the desired takeoff position. He concluded that the mis-positioned trim tab was the cause of the unexpected resistance he encountered when he applied rearwards pressure to the control column.

Engineering inspection

A subsequent inspection by an aircraft engineer confirmed that the trim tab position indicator was de-synchronised from the trim tab position and, with a neutral position indicated, the tab was at or near to the maximum nose-down deflection. The engineer suspected that, for a reason he could not identify, the trim indicator needle had become de-synchronised from the actuator when the trim wheel had been exercised quickly through its entire range. He stated that he had occasionally seen this happen previously to other aircraft types made by the same manufacturer and noted that in the PA-34 it is difficult to view the achieved trim tab position from the cockpit.

Footnote

¹ Aircraft Flight Manuals typically contain Net Performance data and the CAA strongly recommend that appropriate Public Transport factors are applied to take account of: lack of pilot practice, aeroplane/engine wear and tear, less than favourable conditions, and use of incorrect speeds/techniques.

ACCIDENT

Aircraft Type and Registration:	Titan T-51 Mustang, G-DHYS	
No & Type of Engines:	1 Suzuki V6 Mini Merlin piston engine	
Year of Manufacture:	2015 (Serial no: LAA 355-15190)	
Date & Time (UTC):	31 May 2017 at 1433 hrs	
Location:	Gloucestershire Airport, Gloucestershire	
Type of Flight:	Private	
Persons on Board:	Crew - 1	Passengers - None
Injuries:	Crew - None	Passengers - N/A
Nature of Damage:	Main landing gear, propeller and right wing damaged	
Commander's Licence:	Commercial Pilot's Licence	
Commander's Age:	60 years	
Commander's Flying Experience:	2,462 hours (of which 51 were on type) Last 90 days - 95 hours Last 28 days - 24 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot	

Synopsis

The aircraft's right main landing gear collapsed during the latter stages of a normal landing rollout, whilst the aircraft was travelling at low speed. The cause of the landing gear collapse was not positively identified.

History of the flight

Following a local flight in good weather conditions, with light winds, the pilot landed the aircraft normally on Runway 27. As the aircraft slowed to approximately 10-15 mph at the end of the landing roll the pilot gently applied the brakes, but as he did so the aircraft yawed to the left which he could not control using right rudder and right brake. The pilot reported that the wings remained level as the aircraft yawed to the left. The weight transferred to the right main landing gear leg, which collapsed inwards, causing the propeller and right wingtip to contact the runway as the aircraft came to a stop, Figure 1.



Figure 1

G-DHYS following the collapse of the right main landing gear

Aircraft information

The Titan T-51 Mustang is a three-quarter scale replica of the North American P-51 Mustang. It is a homebuilt kit aircraft of steel frame and aluminium skin construction, with a retractable main landing gear. The aircraft was first flown in 2015 and had accumulated 41 hours at the time the accident occurred. The main landing gear (MLG) is of the oleo-pneumatic type with an upper outer cylinder and a lower piston assembly that is attached to the main wheel. The lower piston and main wheel is restrained in rotation by a torque link assembly, Figure 2.

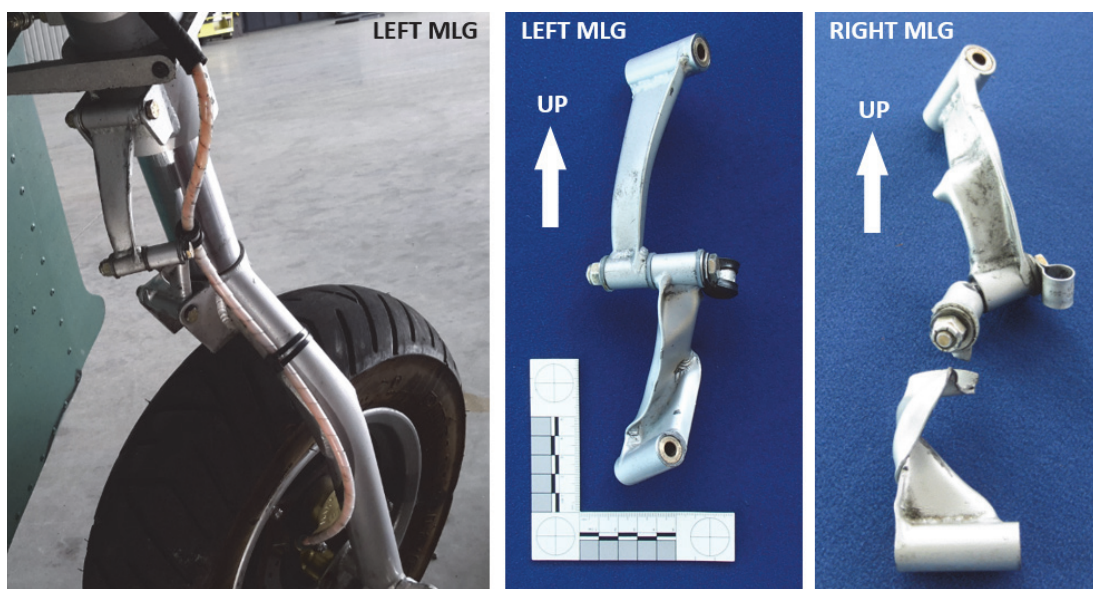


Figure 2

G-DHYS left MLG leg (left), left MLG torque link (centre) and right MLG torque link (right)

Each MLG leg is deployed by a hydraulic actuator via a bellcrank and an adjustable-body link. Instructions provided to kit constructors describe how to adjust the adjustable-body link to ensure that the MLG bellcrank becomes sufficiently over-centre when the landing gear is down. The owner confirmed that he had followed these instructions and that he had not experienced any problems with the MLG deployment during his operation of the aircraft prior to the accident flight.

Aircraft examination

Examination of the aircraft revealed that the right MLG torque links had buckled, allowing the right mainwheel to rotate inwards. This would have caused an inboard side-loading on the MLG leg. The right MLG adjustable-body link was damaged due to excessive bending, caused by the right MLG collapsing inwards whilst the landing gear hydraulic actuator remained in the 'down' position, Figure 3.

The left MLG adjustable-body link was undamaged, consistent with the left MLG remaining locked down during the event. The left MLG torque links were buckled due to excessive side loading, as a consequence of the collapse of the right MLG leg.

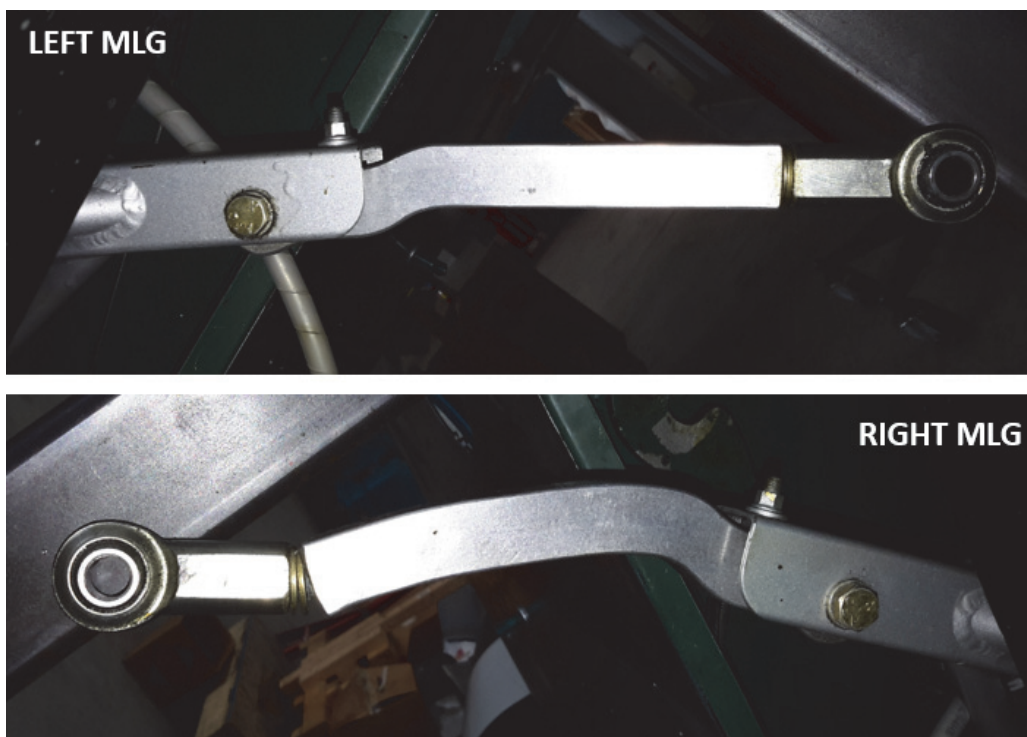


Figure 3

G-DHYS left MLG adjustable-body link (top), and overload-damaged right MLG adjustable-body link (bottom)

Other information

The aircraft kit manufacturer stated that they were aware of four cases of T-51 Mustang MLGs collapsing; in their opinion each case was caused by improper adjustment of the adjustable-body link.

The LAA has approved a set of modified torque links, Figure 4, for installation on G-FION, another T-51 Mustang aircraft that is currently under construction. The modified stronger torque links were developed as an LAA modification as a result of concerns raised by the accident with G-DHYS. If this modification is successful, the LAA will require that T-51 Mustang aircraft, powered by the Suzuki V6 engine and operating on an LAA Permit to Fly, are modified in this manner.



Figure 4

Strengthened MLG torque links installed on G-FION

Analysis

It was not possible to determine, based on the damage to G-DHYS's main landing gear components, whether the right MLG torque links failed before or after the right MLG leg collapsed. If the right MLG torque links had failed first, this would have allowed the right wheel to rotate inwards relative to the leg, thereby imposing an inwards side-load on the leg, causing its subsequent collapse. This possibility is supported by the pilot's recollection that the aircraft's wings remained level as the initial left yaw developed during the landing roll.

It is also possible that the right MLG leg could have collapsed due to a lack of sufficient over-centre of the bellcrank. In this scenario the right wheel would have been subject to high side-loading as the leg collapsed, resulting in the observed damage to the right MLG torque links.

Conclusion

The aircraft's right MLG leg collapsed during the latter stages of a normal landing rollout, whilst the aircraft was travelling at low speed. Inspection of the damaged MLG components did not positively identify the cause of the right MLG leg collapse. The LAA have approved a modification for strengthened MLG torque links for the T-51 Mustang aircraft and pending flight trials, may mandate this modification for certain T-51 Mustang aircraft¹ operating on an LAA Permit to Fly.

Footnote

¹ The modified torque links may not be required for T51 Mustang aircraft powered by Rotax engines, as these variants have a significantly lower maximum operating mass.

ACCIDENT

Aircraft Type and Registration:	Vans RV-6A, G-CCVS	
No & Type of Engines:	1 Superior XP-IO-360-B1A2 piston engine	
Year of Manufacture:	2010 (Serial no: PFA 181A-13413)	
Date & Time (UTC):	15 August 2017 at 1530 hrs	
Location:	Old Sarum Airfield, Wiltshire	
Type of Flight:	Private	
Persons on Board:	Crew - 1	Passengers - None
Injuries:	Crew - 1 (Minor)	Passengers - N/A
Nature of Damage:	Extensive	
Commander's Licence:	Private Pilot's Licence	
Commander's Age:	46 years	
Commander's Flying Experience:	496 hours (of which 65 were on type) Last 90 days - 19 hours Last 28 days - 3 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot	

Synopsis

The aircraft's nose landing gear struck the ground and was damaged when the pilot initiated a go-around, after experiencing turbulence on final approach. During the subsequent landing the nose landing gear collapsed and the aircraft inverted.

History of the flight

The pilot was circuiting to the grass Runway 24 at Old Sarum, in good visibility but with a 40° crosswind from the right of 10-15 kt. On the fourth circuit and during the last 200 ft of the approach, he experienced turbulence which culminated in a sudden downdraught when crossing the threshold at 10-15 ft. He responded by applying full power and pitching up but the aircraft made a hard touchdown in a level attitude before climbing away. There was no indication that the aircraft had been damaged but, for the subsequent landing, the pilot decided to hold the nosewheel off the ground for as long as possible, in case it had been weakened. Despite the pilot's efforts, after the nose landing gear touched down, it collapsed rearwards and when the propeller hit the ground the aircraft flipped inverted and then came to a stop. The pilot managed to shut-off the fuel and electrics and bystanders raised the tail of the aircraft, which allowed him to open the canopy and escape (Figure 1).



Figure 1

G-CCVS after the accident

Pilot's assessment

The pilot assessed that he should have increased his airspeed on the fourth approach to allow for the gusty crosswind, and that his speed had reduced by the time he crossed the threshold, leaving little energy in reserve to help cope with the unexpected downdraught. Consequently the aircraft struck the ground hard and a subsequent study of an observer's video footage later showed that this deformed the nose landing gear leg. The pilot judged that he should have initiated a go-around earlier in his fourth approach, once he appreciated the intensity of the turbulence.

AAIB comment

The AAIB has reported on several previous accidents in which the nose landing gear leg of a Vans RV series aircraft has bent back or collapsed. AAIB Bulletin 3/2017 contains a report concerning G-RPRV, an RV-9A that flipped upside down, and a list of other recorded instances in the UK during which the nose landing gear leg bent back. The report also mentions an 'Anti Splat' kit (Figure 2) which is intended to restrain the nose landing gear leg from tucking under.

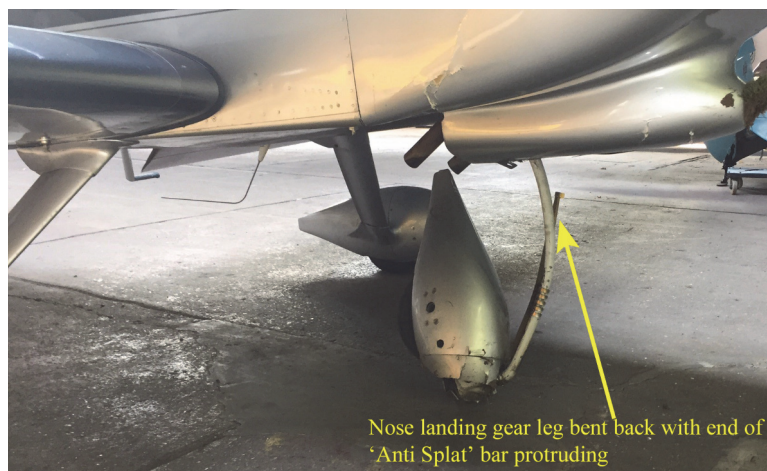


Figure 2

An 'Anti-Splat' kit was fitted to the nose landing gear

ACCIDENT

Aircraft Type and Registration:	3DR Solo (UAS)	
No & Type of Engines:	4 3DR 22x16 mm 880 kv electric motors	
Year of Manufacture:	2016 (Serial no: VUE003)	
Date & Time (UTC):	13 June 2017 at 0930 hrs	
Location:	Kemsley Mill, Kent	
Type of Flight:	Aerial Work	
Persons on Board:	Crew - None	Passengers - None
Injuries:	Crew - N/A	Passengers - N/A
Nature of Damage:	Propeller and motor damage, fuselage cracked, gimbal snapped off	
Commander's Licence:	BNUC-S	
Commander's Age:	43 years	
Commander's Flying Experience:	112 hours (of which 26 were on UAS types) Last 90 days - 5 hours UAS Last 28 days - 3 hours UAS	
Information Source:	Aircraft Accident Report Form submitted by the pilot	

Synopsis

The unmanned aircraft struck a crane during an autonomous flight to survey a construction site. The pilot, who had previously flown the pre-programmed mission at the site, had not taken into account the addition of a new crane.

History of the flight

The 3DR Solo is an unmanned aircraft (UA) with a maximum takeoff weight of 1.8 kg (Figure 1). With its flight controller it forms an unmanned aircraft system (UAS). It was being flown to document a construction site using a Go Pro Hero 4 camera mounted on a gimbal below the aircraft.

The pilot had flown the UA previously at the construction site using a pre-programmed mission profile with four waypoints. All waypoints were programmed to be flown at 400 ft agl, which was above the height of the three cranes at the site. The UA took off from a car park on the north side of the site and started climbing to its first waypoint at the south-western tip of the site (Figure 2). Before it reached 400 ft agl it collided with the jib of a crane. The crane had not been at the site during the previous flight, and from where the pilot was situated in the car park it was difficult for him or his observer to tell that it was about to strike the crane because of a lack of perspective. The UA fell to the ground and was damaged but there was no damage to the construction site.



Figure 1
3DR Solo UAS with Go Pro Hero 4 camera

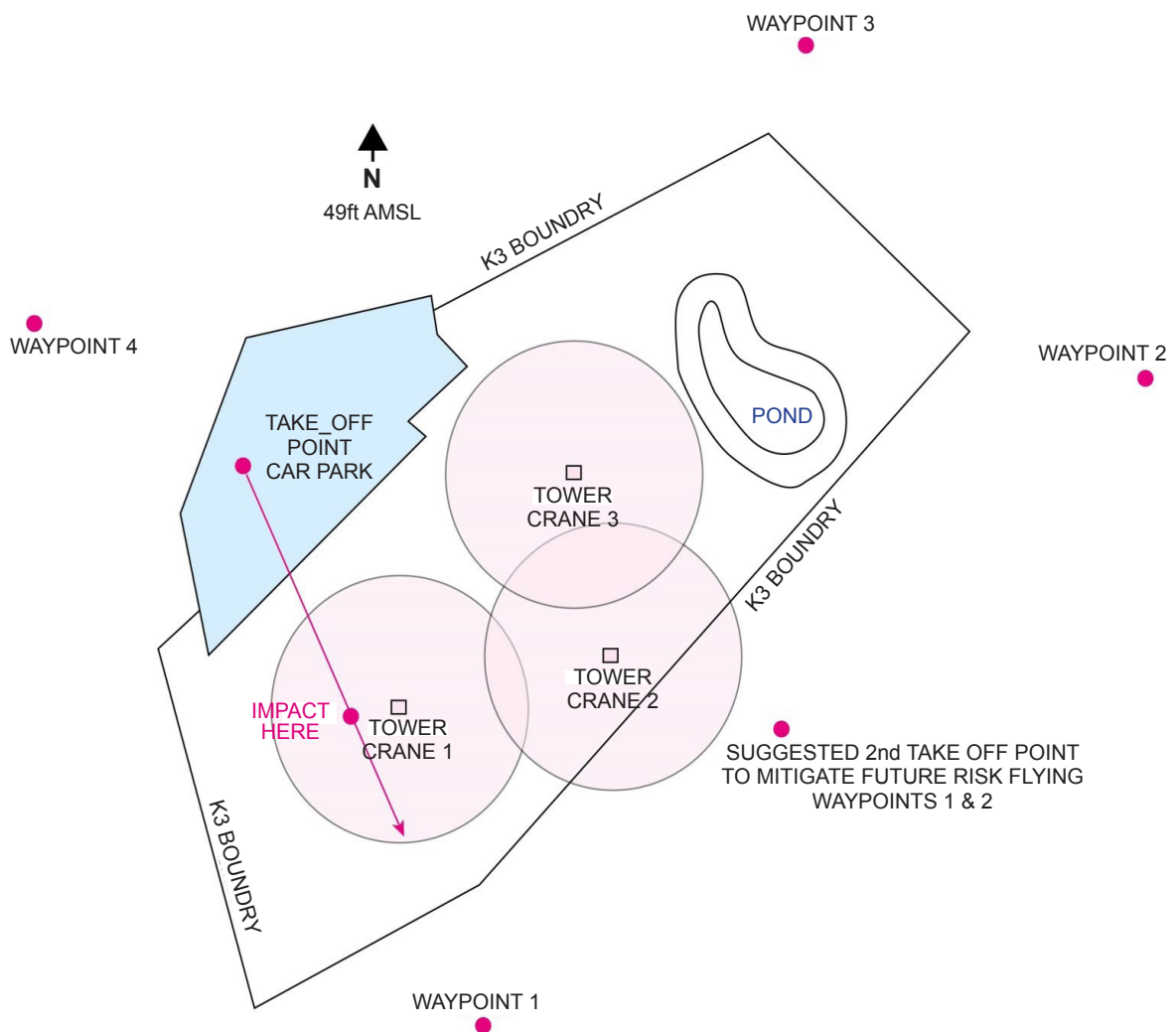


Figure 2
The planned route and location of the collision

Pilot's comments

The pilot stated that the accident was caused by the incorrect programming of the autonomous waypoint mission which had not taken into account the new crane at the site. He stated that future missions would be planned such that the UA ascended vertically to 400 ft shortly after takeoff, in a safe corridor, before surveying the site and would avoid intersecting the working radius of any of the cranes. He also decided to split the mission in two and to survey the southern boundary by taking off from a new position on the south side. This would avoid flying directly across the site and would afford him a better view of the UA's relative location to the cranes.

ACCIDENT

Aircraft Type and Registration:	Ikarus C42, G-FLYM	
No & Type of Engines:	1 Rotax 912ULS piston engine	
Year of Manufacture:	2007 (Serial no: 0707-6903)	
Date & Time (UTC):	29 May 2017 at 1550 hrs	
Location:	Near Castlewellan, Co Down	
Type of Flight:	Private	
Persons on Board:	Crew - 1	Passengers - 1
Injuries:	Crew - None	Passengers - None
Nature of Damage:	Damaged beyond economic repair	
Commander's Licence:	National Private Pilot's Licence	
Commander's Age:	56 years	
Commander's Flying Experience:	46 hours (all on type) Last 90 days - 30 hours Last 28 days - 3 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot and further enquiries by the AAIB	

Synopsis

On the return leg to the airfield the pilot was caught out by rising terrain and a lowering cloudbase. He could not see a field in which to carry out an emergency landing so he landed in the tops of trees.

History of the flight

The pilot had obtained his National Private Pilot's Licence in the month before the accident. All his training had been on the Ikarus C42 microlight aircraft from Kernan microlight site near Tandragee, Co Armagh. He was planning a flight with one passenger around the Mourne Mountains about 19 nm to the south-east. The cloudbase was about 1,100 to 1,200 ft aal and the visibility 7 to 10 km with light wind. The 275 m paved runway was at an elevation of 65 ft amsl. Before he departed an instructor advised him to stay in "the local area".

The pilot took off from Runway 18 and then headed south towards Newry and Warren Point (Figure 1). He reported that approaching Warren Point, which is almost at sea-level, the cloud base was just above 1,000 ft and it continued to be so as he flew round the south of the Mourne Mountains. During his return flight via Newcastle he encountered rising ground, lowering cloud and reduced visibility in the area of Castlewellan. He decided that his best course of action was to land in a field. He knew that the C42 could be landed in a short distance and was prepared to trailer the aircraft back if the field was too small for

takeoff. However, he could not see a field and instead he carried out an emergency landing into trees on the top of a hill. The aircraft sustained significant damage but he and his passenger were uninjured.

The accident site was located about 1.5 nm north-west of Castlewellan where the terrain rises to 750 ft amsl.

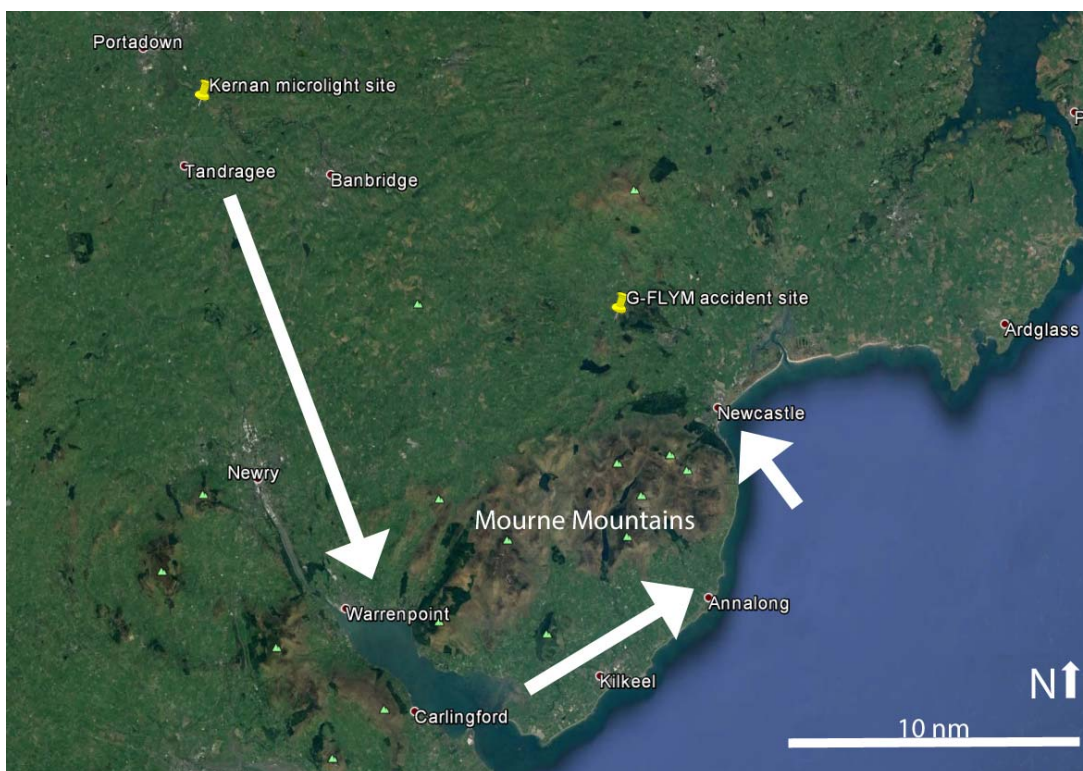


Figure 1

Approximate route flown from Kernan microlight site to the accident site
(underlying image © Google Earth)

Pilot's comments

The pilot stated that he was caught out by the rising terrain and lowering cloud, and that this was due to his inexperience. When the instructor advised him to stay in the local area, he interpreted this area to include up to Newry which was 13 nm south of Kernan. He did not think he was doing anything risky by going beyond this distance because when he reached Newry the cloudbase was still above 1,000 ft.

Another instructor at Kernan was asked how they would interpret the term 'local area' and they said about 4 to 5 nm from the airfield.

Analysis

The instructor who advised the pilot before the flight probably wanted him to stay within a few miles of the airfield due to the low cloudbase. However, the pilot considered that it was safe to fly further than this as long as the cloudbase remained above 1,000 ft. He had

probably not realised that he was heading towards terrain that was as high as 750 ft on his return leg from Newry. It is noted that, even when travelling at a typical C42 cruise speed of 85 kt, the 'situation ahead' can change rapidly and low cloud can hide the tops of hills.

ACCIDENT

Aircraft Type and Registration:	Pegasus Quik GT450, G-CDUU	
No & Type of Engines:	1 Rotax 912-UL piston engine	
Year of Manufacture:	2006 (Serial no: 8165)	
Date & Time (UTC):	24 September 2017 at 1210 hrs	
Location:	Orston Airfield, Nottinghamshire	
Type of Flight:	Private	
Persons on Board:	Crew - 1	Passengers - None
Injuries:	Crew - None	Passengers - N/A
Nature of Damage:	Nosewheel forks and fibreglass pod	
Commander's Licence:	Private Pilot's Licence	
Commander's Age:	55 years	
Commander's Flying Experience:	431 hours (of which 51 were on type) Last 90 days - 8 hours Last 28 days - 1 hour	
Information Source:	Aircraft Accident Report Form submitted by the pilot	

The pilot was operating a local flight from a private farm strip near Orston, Nottinghamshire. After a fifty minute flight, he returned to land on Runway 11 where the surface wind was from 080° at approximately 14 kt.

On approach, the aircraft encountered a gust at approximately 10-15 ft which pushed the aircraft off the extended centreline. The pilot reported that whilst attempting to correct back to the centreline he did not arrest the rate of descent before the aircraft touched down. The aircraft landed firmly and tracked across the runway coming to a halt in rough grass on the right side of the runway. The nosewheel forks bent in the initial impact and the fibreglass pod was damaged as the aircraft left the runway; the pilot was uninjured.

The pilot had not previously landed on this runway and was not familiar with the turbulence generated by the adjacent trees and barns. He assessed that the accident occurred because he did not arrest the rate of descent prior to landing and did not react quickly enough to go around. He also stated he was disorientated by the down-sloping runway. On reflection, the pilot suggested he should have flown a few circuits to this runway in calm conditions prior to operating from it in a crosswind.

ACCIDENT

Aircraft Type and Registration:	Skyranger 912S(1), G-ZADA	
No & Type of Engines:	1 Rotax 912ULS piston engine	
Year of Manufacture:	2006 (Serial no: BMAA/HB/446)	
Date & Time (UTC):	18 June 2017 at 1800 hrs	
Location:	Ince Airfield, Merseyside	
Type of Flight:	Private	
Persons on Board:	Crew - 1	Passengers - 1
Injuries:	Crew - None	Passengers - 1 (Serious)
Nature of Damage:	Extensive damage, beyond economic repair	
Commander's Licence:	National Private Pilot's Licence	
Commander's Age:	68 years	
Commander's Flying Experience:	400 hours (of which 130 were on type) Last 90 days - 6 hours Last 28 days - 6 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot and further enquiries by the AAIB	

Synopsis

Following a high and fast approach, the aircraft landed further along the runway than planned and ran off the end of the grass runway into a river.

History of the flight

After departing from Shobdon Airfield at 1700 hrs, the pilot flew in company with two other aircraft to Ince where he had landed once before. The visibility was good, the wind was light and variable and the temperature was 20°C when one of the other aircraft (also a Skyranger) led the trio overhead Ince and into the left-hand circuit for grass Runway 36. As the lead aircraft touched down, its pilot realised the right mainwheel tyre had deflated, so he steered right, towards the edge of the dry, 20 m wide strip, and shut down the engine. After making a radio call to inform other aircraft, he and his passenger quickly climbed out and pushed the aircraft off the runway into an adjoining area of long grass.

The following aircraft was G-ZADA, but when the pilot turned onto final approach he was higher than intended and with an airspeed of 70 mph instead of 60 mph. As he side-slipped his aircraft towards the 380 m long runway, he was satisfied that the aircraft ahead was clear of his landing path and, although he realised he was going to touch down further along the runway than he wished, he believed he still had sufficient landing distance. However, the airspeed did not bleed off in the final stage of the approach as

he expected, possibly because the aircraft's fabric covering had recently been replaced, and he estimated that the speed was still 10 mph above the speed he intended at touchdown.

Once on the runway the pilot applied maximum braking but was unable to halt the aircraft before the end of the runway, where there is a steep river bank. The aircraft overran the runway and crossed over the shallow river, which was approximately 10 m wide, before hitting the far bank and coming to rest (Figure 1). The occupants had no difficulty escaping from the aircraft but the passenger subsequently experienced chest pains and was later diagnosed to have fractured a rib.



Figure 1

View of the aircraft in its resting place by the north bank of the River Alt.
Note power lines which cross the extended centreline of Runway 36

Other witness information

The pilot of the lead aircraft provided a GPS-derived plot of his aircraft's flight which indicated that it stopped approximately two-thirds of the way along Runway 36 (Figure 2) and this correlated with his recollection, as well as that of other witnesses. He did not see G-ZADA land but, after helping to push the disabled aircraft clear of the runway, his passenger glanced back and saw G-ZADA touchdown approximately in line with his own position and then lost sight of it.

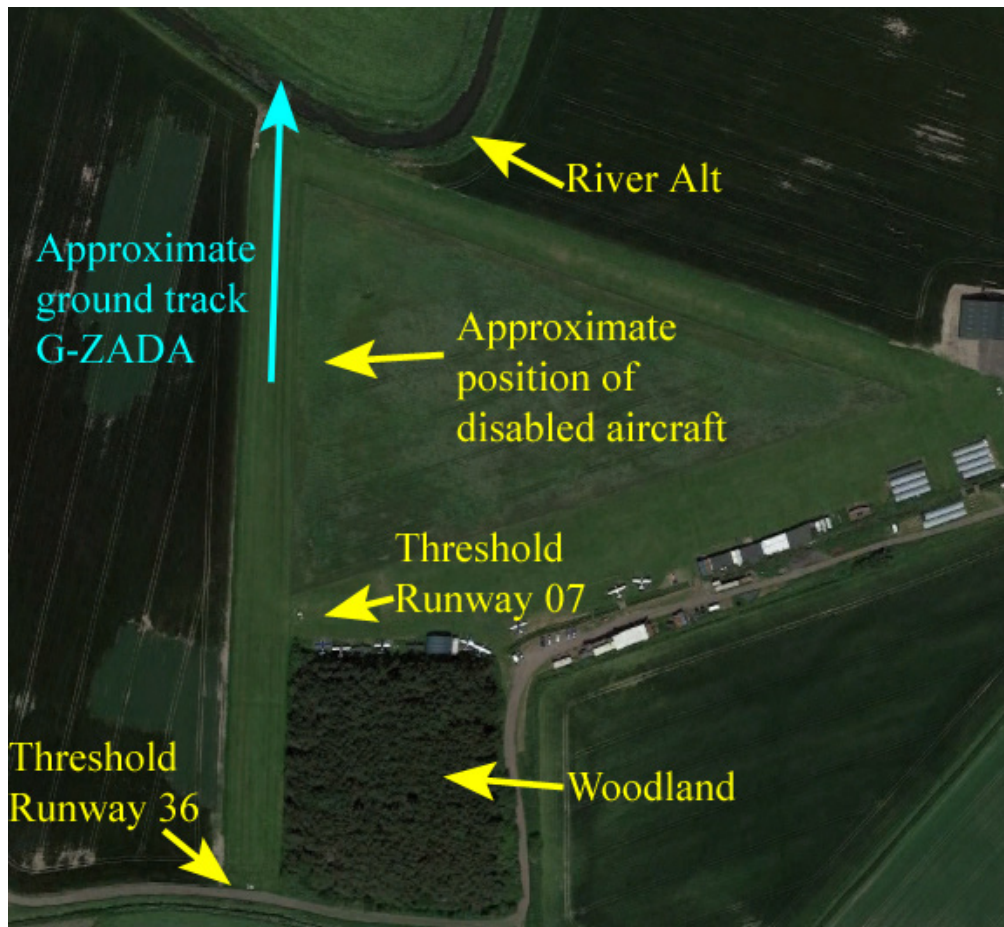


Figure 2

Ince Airfield; Runway 36 and aircraft's approximate ground track after touchdown
 ©2017Google, Image © DigitalGlobe

Pilot's assessment

Departing Shobdon, the pilot calculated the aircraft was close to its maximum takeoff weight, so when he landed it was only a few kilograms lighter. He did not refer to the relevant landing performance calculations (see *Skyranger Operator's Manual* section) until after the accident but he was confident that there was sufficient landing distance available, even when he realised he was high and would land further along the runway than intended.

The pilot stated that, while circuiting to Runway 36, he was distracted by trying to avoid noise-sensitive areas and, as a result, he turned onto final approach high and fast. He also thought that woodland on the east side of Runway 36 (Figure 2), may have initially given him the impression that the threshold was north of the woodland, where Runway 36 passes the threshold of Runway 07. When he touched down he was confident there was still sufficient distance available to bring the aircraft to a halt. He did not consider initiating a baulked landing and later noticed power lines which run across the extended centreline, north of the river, and was glad he did not try to take off again from the upwind end of the runway.

The pilot did not think the presence of the disabled aircraft caused him to adjust his approach path, although he later agreed that it may have been a distraction. He stated that he had learnt several lessons from the accident and in future he plans to initiate a go-around if he realises he is high or fast when approaching a relatively short runway, or if he is unable to touchdown close to the threshold for any other reason.

Another observation made by the pilot after the accident was that, given the light wind, he should have landed on Runway 29, which he had used on his previous visit, because it is slightly longer and the circuit is less affected by noise sensitive areas. He also assessed that, when it became evident that he was not going to stop before the end of the runway, he could have steered the aircraft at low speed into the long grass to his right.

Skyranger Operators' Manual

The *Skyranger Operators' Manual* states that the aircraft's unfactored landing distance (from a height of 50 ft agl) is 250 m, with landing flap and an indicated approach airspeed of 70 mph. A factor of 1.05 is to be applied for every 10°C above 15°C and an additional safety factor of 1.33 is also recommended; giving a factored landing distance required of 350 m in this case (from a height of 50 ft agl). However, the landing safety factor currently recommended by the British Microlight Aircraft Association (BMAA) and the CAA for such aircraft is 1.43. Details of this, plus other performance considerations for takeoff and landing, are discussed in the CAA's Safety Sense Leaflet 7c '*Aeroplane Performance*' and in the '*Pre-Flight Preparation*' section of CAP 1535, '*The Skyway Code*'.

The aircraft manufacturer stated that the quoted safety factor of 1.33 pre-dates the BMAA's and the CAA's current recommendations and the Operators' Manual will now be reviewed. However, the manufacturer believes the unfactored landing distances in the manual are achievable by 'an average pilot'.

Miscellaneous

This section contains Addenda, Corrections and a list of the ten most recent Aircraft Accident ('Formal') Reports published by the AAIB.

The complete reports can be downloaded from the AAIB website (www.aaib.gov.uk).

BULLETIN CORRECTION

Aircraft Type and Registration:	Agusta AW139, G-CIPW
Date & Time (UTC):	9 June 2017 at 1625 hrs
Location:	Viscount Platform, North Sea
Information Source:	Aircraft Accident Report Form submitted by the pilot plus operator's internal investigation and subsequent AAIB enquiries

AAIB Bulletin No 12/2017, page 79 refers

This report was inadvertently classified as a **SERIOUS INCIDENT** whereas the correct classification is **INCIDENT**.

The online version of the report was corrected when published on 14 December 2017.

TEN MOST RECENTLY PUBLISHED FORMAL REPORTS ISSUED BY THE AIR ACCIDENTS INVESTIGATION BRANCH

- | | |
|--|---|
| 2/2011 Aerospatiale (Eurocopter) AS332 L2 Super Puma, G-REDL
11 nm NE of Peterhead, Scotland on 1 April 2009.
Published November 2011. | 2/2015 Boeing B787-8, ET-AOP
London Heathrow Airport on 12 July 2013.
Published August 2015. |
| 1/2014 Airbus A330-343, G-VSXY
at London Gatwick Airport on 16 April 2012.
Published February 2014. | 3/2015 Eurocopter (Deutschland) EC135 T2+, G-SPAO
Glasgow City Centre, Scotland on 29 November 2013.
Published October 2015. |
| 2/2014 Eurocopter EC225 LP Super Puma G-REDW, 34 nm east of Aberdeen, Scotland on 10 May 2012
and
G-CHCN, 32 nm south-west of Sumburgh, Shetland Islands on 22 October 2012.
Published June 2014. | 1/2016 AS332 L2 Super Puma, G-WNSB
on approach to Sumburgh Airport on 23 August 2013.
Published March 2016. |
| 3/2014 Agusta A109E, G-CRST
Near Vauxhall Bridge, Central London on 16 January 2013.
Published September 2014. | 2/2016 Saab 2000, G-LGNO
approximately 7 nm east of Sumburgh Airport, Shetland on 15 December 2014.
Published September 2016. |
| 1/2015 Airbus A319-131, G-EUOE
London Heathrow Airport on 24 May 2013.
Published July 2015. | 1/2017 Hawker Hunter T7, G-BXFI
near Shoreham Airport on 22 August 2015.
Published March 2017. |

Unabridged versions of all AAIB Formal Reports, published back to and including 1971,
are available in full on the AAIB Website

<http://www.aaib.gov.uk>

GLOSSARY OF ABBREVIATIONS

aal	above airfield level	lb	pound(s)
ACAS	Airborne Collision Avoidance System	LP	low pressure
ACARS	Automatic Communications And Reporting System	LAA	Light Aircraft Association
ADF	Automatic Direction Finding equipment	LDA	Landing Distance Available
AFIS(O)	Aerodrome Flight Information Service (Officer)	LPC	Licence Proficiency Check
agl	above ground level	m	metre(s)
AIC	Aeronautical Information Circular	MDA	Minimum Descent Altitude
amsl	above mean sea level	METAR	a timed aerodrome meteorological report
AOM	Aerodrome Operating Minima	min	minutes
APU	Auxiliary Power Unit	mm	millimetre(s)
ASI	airspeed indicator	mph	miles per hour
ATC(C)(O)	Air Traffic Control (Centre)(Officer)	MTWA	Maximum Total Weight Authorised
ATIS	Automatic Terminal Information Service	N	Newtons
ATPL	Airline Transport Pilot's Licence	N_R	Main rotor rotation speed (rotorcraft)
BMAA	British Microlight Aircraft Association	N_g	Gas generator rotation speed (rotorcraft)
BGA	British Gliding Association	N_1	engine fan or LP compressor speed
BBAC	British Balloon and Airship Club	NDB	Non-Directional radio Beacon
BHPA	British Hang Gliding & Paragliding Association	nm	nautical mile(s)
CAA	Civil Aviation Authority	NOTAM	Notice to Airmen
CAVOK	Ceiling And Visibility OK (for VFR flight)	OAT	Outside Air Temperature
CAS	calibrated airspeed	OPC	Operator Proficiency Check
cc	cubic centimetres	PAPI	Precision Approach Path Indicator
CG	Centre of Gravity	PF	Pilot Flying
cm	centimetre(s)	PIC	Pilot in Command
CPL	Commercial Pilot's Licence	PNF	Pilot Not Flying
°C,F,M,T	Celsius, Fahrenheit, magnetic, true	POH	Pilot's Operating Handbook
CVR	Cockpit Voice Recorder	PPL	Private Pilot's Licence
DME	Distance Measuring Equipment	psi	pounds per square inch
EAS	equivalent airspeed	QFE	altimeter pressure setting to indicate height above aerodrome
EASA	European Aviation Safety Agency	QNH	altimeter pressure setting to indicate elevation amsl
ECAM	Electronic Centralised Aircraft Monitoring	RA	Resolution Advisory
EGPWS	Enhanced GPWS	RFFS	Rescue and Fire Fighting Service
EGT	Exhaust Gas Temperature	rpm	revolutions per minute
EICAS	Engine Indication and Crew Alerting System	RTF	radiotelephony
EPR	Engine Pressure Ratio	RVR	Runway Visual Range
ETA	Estimated Time of Arrival	SAR	Search and Rescue
ETD	Estimated Time of Departure	SB	Service Bulletin
FAA	Federal Aviation Administration (USA)	SSR	Secondary Surveillance Radar
FDR	Flight Data Recorder	TA	Traffic Advisory
FIR	Flight Information Region	TAF	Terminal Aerodrome Forecast
FL	Flight Level	TAS	true airspeed
ft	feet	TAWS	Terrain Awareness and Warning System
ft/min	feet per minute	TCAS	Traffic Collision Avoidance System
g	acceleration due to Earth's gravity	TGT	Turbine Gas Temperature
GPS	Global Positioning System	TODA	Takeoff Distance Available
GPWS	Ground Proximity Warning System	UAS	Unmanned Aircraft System
hrs	hours (clock time as in 1200 hrs)	UHF	Ultra High Frequency
HP	high pressure	USG	US gallons
hPa	hectopascal (equivalent unit to mb)	UTC	Co-ordinated Universal Time (GMT)
IAS	indicated airspeed	V	Volt(s)
IFR	Instrument Flight Rules	V_1	Takeoff decision speed
ILS	Instrument Landing System	V_2	Takeoff safety speed
IMC	Instrument Meteorological Conditions	V_R	Rotation speed
IP	Intermediate Pressure	V_{REF}	Reference airspeed (approach)
IR	Instrument Rating	V_{NE}	Never Exceed airspeed
ISA	International Standard Atmosphere	VASI	Visual Approach Slope Indicator
kg	kilogram(s)	VFR	Visual Flight Rules
KCAS	knots calibrated airspeed	VHF	Very High Frequency
KIAS	knots indicated airspeed	VMC	Visual Meteorological Conditions
KTAS	knots true airspeed	VOR	VHF Omnidirectional radio Range
km	kilometre(s)		
kt	knot(s)		
