



Air Accident Investigation Unit Ireland

FACTUAL REPORT

ACCIDENT

**Piper J5A (Cub Cruiser), EI-AXT
Near Shantonagh, Co. Monaghan, Ireland**

13 September 2016



**An Roinn Iompair
Turasóireachta agus Spóirt**

Department of Transport,
Tourism and Sport

FACTUAL REPORT

Foreword

This safety investigation is exclusively of a technical nature and the Final Report reflects the determination of the AAIU regarding the circumstances of this occurrence and its probable causes.

In accordance with the provisions of Annex 13¹ to the Convention on International Civil Aviation, Regulation (EU) No 996/2010² and Statutory Instrument No. 460 of 2009³, safety investigations are in no case concerned with apportioning blame or liability. They are independent of, separate from and without prejudice to any judicial or administrative proceedings to apportion blame or liability. The sole objective of this safety investigation and Final Report is the prevention of accidents and incidents.

Accordingly, it is inappropriate that AAIU Reports should be used to assign fault or blame or determine liability, since neither the safety investigation nor the reporting process has been undertaken for that purpose.

Extracts from this Report may be published providing that the source is acknowledged, the material is accurately reproduced and that it is not used in a derogatory or misleading context.

¹ **Annex 13:** International Civil Aviation Organization (ICAO), Annex 13, Aircraft Accident and Incident Investigation.

² **Regulation (EU) No 996/2010** of the European Parliament and of the Council of 20 October 2010 on the investigation and prevention of accidents and incidents in civil aviation.

³ **Statutory Instrument (SI) No. 460 of 2009:** Air Navigation (Notification and Investigation of Accidents, Serious Incidents and Incidents) Regulations 2009.



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In accordance with Annex 13 to the Convention on International Civil Aviation, Regulation (EU) No 996/2010 and the provisions of SI No. 460 of 2009, the Chief Inspector of Air Accidents on 30 September 2016 appointed John Owens as the Investigator-in-Charge to carry out an Investigation into this Accident and prepare a Report.

Aircraft Type and Registration:	Piper J5A Cub Cruiser, EI-AXT	
No. and Type of Engines:	Rolls Royce Continental O-200-A	
Aircraft Serial Number:	5-498	
Year of Manufacture:	1940	
Date and Time (UTC)⁴:	13 September 2016, 10.55 hrs	
Location:	Near Shantonagh, Castleblaney, County Monaghan, Ireland	
Type of Operation:	Private	
Persons on Board:	Crew - 1	Passengers - Nil
Injuries:	Crew - Nil	
Nature of Damage:	Substantial	
Commander's Licence:	Private Pilot Licence (PPL) Aeroplanes (A) issued by the Civil Aviation Authority (CAA) of the United Kingdom (UK)	
Commander's Age:	45 years	
Commander's Flying Experience:	260 hours, of which 150 were on type	
Notification Source:	Pilot	
Information Source:	Report Form submitted by the Pilot AAIU Field Investigation	

⁴ UTC: Co-ordinated Universal Time. All times in this report are UTC (local time minus one hour on the accident date).

FACTUAL REPORT

SYNOPSIS

When landing in a sloping agricultural field near Castleblaney Co. Monaghan, following a flight from a private airstrip in Co. Galway, the tail-wheel aircraft touched down hard and bounced. The Pilot applied engine power *“to avoid a stall”* and the aircraft touched down again approximately 45 metres (m) further on. This was followed by a series of bounces and a loss of directional control, resulting in the right hand wing tip making contact with the ground. The aircraft came to rest in a nose-down position. The Pilot, who was the sole occupant, was uninjured.

NOTIFICATION

It is a requirement of SI No. 460 of 2009 that pilots inform the AAIU of any serious incident or accident as soon as practicable by the most rapid means available. The AAIU was informed of this accident on 30 September 2016, 17 days after it occurred. The Pilot stated that he did not immediately report it as he considered the damage was not structural. He said that following a more detailed damage inspection and a discussion with other pilots, he reported the occurrence to the AAIU.

1. FACTUAL INFORMATION

1.1 History of the Flight

3

The Pilot flew the aircraft from a private airstrip in Co. Galway to an agricultural field near Castleblaney Co. Monaghan. He reported that when the aircraft was overhead the field at approximately 2,000 feet (ft) Above Mean Sea Level (AMSL), and while descending on a north-westerly downwind leg, he surveyed the intended landing area to his left. The Pilot reported that he used sideslip⁵ to lose height on the final approach and flared the aircraft as it *“came close to the ground”*. He reported that he *“misjudged the flare”* and that the aircraft *“impacted the surface heavily”*. He said the aircraft became airborne again and that he *“applied power to avoid a stall”*, which reduced the field length available for his landing roll.

The aircraft made contact with the surface again approximately 45 m further on and experienced a series of bounces for about another 45 m, before passing through a gap in hedgerow that traversed the field. The Pilot said that he reduced the engine power after the gap and braked hard. He said that towards the end of the landing run, directional control was lost, resulting in a ground loop⁶ (nose left), which caused the aircraft's right hand wing tip to make contact with the ground. Further braking was applied in an attempt to counteract the ground loop, but this resulted in the aircraft tipping forward and the propeller making contact with the ground. The aircraft came to a stop in a nose-down position, approximately 165 m after the initial touchdown point.

⁵ **Sideslip:** An intentional cross-control manoeuvre which can be used to increase the rate of descent.

⁶ **Ground Loop:** A sharp, uncontrolled turn while moving on the ground, especially after landing or on take-off. Tail wheel, propeller-driven aircraft are more susceptible to ground loop.



The Pilot was asked if he had assessed the landing site prior to the day of the occurrence. He said that he had not walked the field, but that he “viewed the field from the [road/south-east] entrance” approximately two years previously; however, this was not from the point of view of landing there. He reported that before the flight he “checked it on Google Earth” and that the owner of the field briefed him “regards surface and length of grass”.

The Pilot stated that the site’s gradient was steeper than he expected and that the rising ground on touchdown may have been a factor in the hard landing. He commented that while it was possible to see a gradient on the landing site on the downwind leg, he didn’t consider it to be of significance at the time. He said that he should have carried out a missed approach (go-around) to assess the field, as it was his first landing there. He also commented that after the occurrence he realised that he had landed with a slight tailwind, whereas he had initially considered the local conditions as calm. He thought that the tailwind may have been a factor in the event.

1.2 Landing Site

The Investigation carried out an inspection of the accident site, which included an aerial survey using a Remotely Piloted Aircraft System (RPAS). **Photo No. 1** is from this survey. The grass-covered surface sloped uphill along the intended landing path (approximately 142 degrees magnetic/south-east), and downhill to the left and right. The field was bounded by a hedgerow. Trees approximately 7 m in height were present in the hedgerow on the north-west side of the field, over which the approach was made. Another hedgerow, running north-east/south-west and approximately 135 m long, traversed the field, approximately 145 m from the north-west end. There was a 20 m gap in this hedgerow, which the Pilot stated had been prepared by the landowner around 10 days before the arrival of the aircraft. A tall tree was located immediately to the right of this gap. There were farm buildings at the south-east end of the field, approximately 245 m from the north-west end. The up-slope at the touchdown point, which was about 60 m into the field, was measured to be approximately 3 degrees. This angle increased closer to the north-west (approach) end.

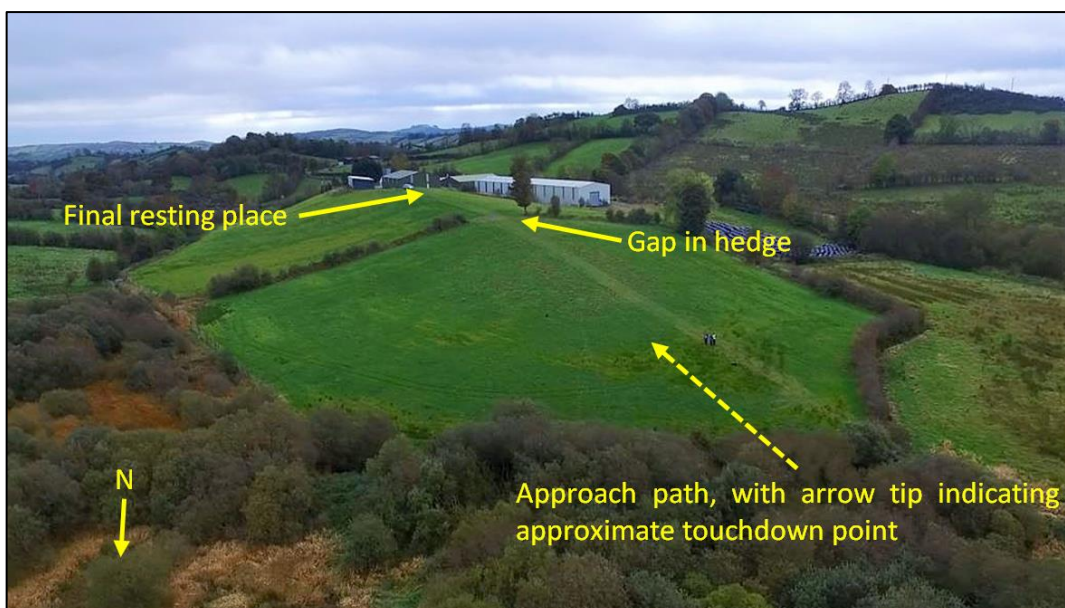


Photo No. 1: Landing site (Note: The visible track along the field’s centre line was caused by farm vehicles)

FACTUAL REPORT

1.3 Subsequent Actions

The Pilot inspected the aircraft at the field in Co. Monaghan following the occurrence and was aware that the right hand wing tip had sustained damage and that a “bar in [the front left hand side of] the cockpit” was “bulging” and “bent”. Although the aircraft had come to rest in a nose down position, the Pilot was of the understanding that the propeller was undamaged. Approximately 20 minutes after the occurrence, he turned the aircraft around, performed a take-off in the opposite direction and flew back to the airstrip in Co. Galway. During the take-off, he realised that the aircraft “was weak on that [the left hand] side” and said he kept this in mind and landed “on the right wheel” in Co. Galway.

1.4 Personnel Information

The Pilot held a PPL (A) issued by the UK CAA with an SEP (Single Engine Piston) rating, which was valid at the time of the occurrence. The Pilot’s Class 2 Medical Certificate was issued by an Irish Aviation Authority (IAA) approved Aeromedical Examiner (AME) and was also valid at the time. The Pilot’s total flying experience is included in the table below.

Total all types:	260 hours
Total on type:	150 hours
Total P1 on type:	140 hours
Last 90 days:	17 hours
Last 28 days:	6 hours

5 1.5 Aircraft Information

1.5.1 General

The tail-wheel aircraft, a Piper J-5A, was a high-wing, strut-braced monoplane, with a wing span of 35 feet and 5.5 inches (10.8 m) (**Photo No. 2**). It was manufactured in 1940 and was fitted with a Rolls-Royce/Continental O-200-A engine, which powered a two-bladed fixed-pitch propeller. The fabric-covered fuselage had a welded tubular steel frame. The aircraft had seating for three people—the Pilot in front and two side-by-side passengers in the rear.

The IAA issued a Flight Permit for the aircraft on 18 July 2014. The most recent ‘Permit Inspection’ was certified by an Irish Light Aviation Society (ILAS) inspector on 7 July 2016. A condition of the Flight Permit is that “the aircraft shall be flown strictly in accordance with the limitations, procedures and conditions contained in the applicable Aircraft Flight Manual”.

1.5.2 Performance

The Pilot provided the Investigation with the operating handbook used for the aircraft. This handbook was for a Piper Super Cruiser (PA-12), which is an upgraded J5A Cub Cruiser. According to this handbook, the minimum landing roll is 390 feet (119 m) when operated in its ‘utility’⁷ category or 470 feet (143 m) when operated normally. The maximum total weight authorised was 1,450 lbs (658 kg).

⁷ **Utility Category:** When the gross weight does not exceed 1,500 lbs (680 kg).



Photo No. 2: EI-AXT (registration markings are in accordance with an IAA-issued exemption)

1.6 Damage to Aircraft

Two Inspectors of Air Accidents inspected the aircraft on 3 October 2016 at the airstrip in Co. Galway. Damage to the right hand wing tip was observed (**Photo No. 3**). Damage to the tubular steel frame surrounding the cockpit on the left hand side was also visible (**Photo No. 4**) (the aircraft's canvas covering was peeled back at this location to facilitate this inspection). A substantial crease in the fuselage fabric was also evident above the left hand main landing gear support strut. It was noted that the aircraft was leaning to the left.

Subsequently, an approved aircraft maintenance engineer carried out a damage inspection and prepared a report. The engineer made the following observations:

- The propeller was found to be approximately 30 millimetres “out of track”, and while there was “no obvious distortion of the blades”, an engine shock load inspection was deemed necessary because the propeller had made contact with the ground.
- The right hand wing tip suffered impact damage “which will require partial disassembly, detailed structural inspections of the wing structure, struts and attachment points, associated repairs...and...checks”.
- The forward left hand side fuselage tubular structure “has a broken tube”.
- There is a “bent lower cross member tube in the rear fuselage behind the aft seat”.



Photo No. 3: Damage to right hand wing tip

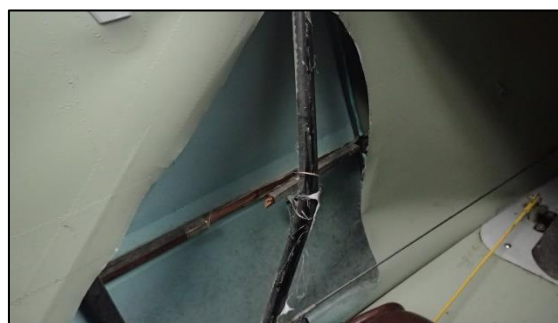


Photo No. 4: Damage to fuselage tubular steel frame, viewed from within the cockpit (canvas peeled back to facilitate inspection)

FACTUAL REPORT

1.7 Meteorological Information

Met Éireann, the Irish meteorological service, was asked to provide details of the weather conditions prevailing in the area at the time of the occurrence. The meteorological aftercast received by the Investigation stated the following:

Surface Wind:	350° at 5 knots (kts)
Surface Temperature:	14° Celsius (C)
Mean Sea Level (MSL) Pressure:	1013 hectopascals (hPa)
Visibility:	20 kilometres (km)

The Pilot advised that there was no significant weather and that the actual wind at the site of the occurrence was 3 kts from the North. However, he reported that a forecast he had obtained at 09.00 hrs indicated calm conditions.

1.8 Legislation Regarding Landing Sites

The IAA's 'Aerodromes and Visual Ground Aids Order' (SI No. 355 of 2008), states in Paragraph (4) of Article 5 (*Place of take-off etc. of aircraft*):

A private aeroplane...may, unless otherwise directed by the Authority, use a place which is not licensed as an aerodrome...provided that the pilot of such an aeroplane shall:

- *Hold a valid pilot licence, other than a student pilot licence,*
- *Ensure that landing and take-off at such place can be effected without undue hazard to persons and property, and*
- *Obtain the prior permission of the owner or occupier of that place...*

1.9 Human Factors: Expectation Bias and Plan Continuation Bias

An [Aviation Investigation Report](#)⁸ published in 2017 by the Transportation Safety Board (TSB) of Canada, regarding a hard landing and runway excursion involving a Beechcraft King Air, discusses issues relating to 'expectation bias' and 'plan continuation bias'. The TSB's report states that "expectation bias contends that when individuals expect one situation, they are less likely to notice cues indicating that the situation is not quite what it seems". In referring to another publication⁹, it states that plan continuation bias (also known as 'get-there-itis') is "a deep-rooted tendency of individuals to continue their original plan of action even when changing circumstances require a new plan".

⁸ TSB Canada Aviation Investigation Report A15A0054.

⁹ Berman, B. A., & Dismukes, R. K. (2006, December). Pressing the Approach. *Aviation Safety World*, pp. 28-33.



2. AAIU COMMENT

2.1 General

The IAA's 'Aerodromes and Visual Ground Aids Order' (SI No. 355 of 2008) permits landings at locations that are not licensed as an aerodrome, provided that the landowner's permission is obtained and that the "landing and take-off at such place can be effected without undue hazard to persons and property...". In this case, the landowner was aware of the Pilot's intention to land at the site. However, the Investigation considers that the field, with its sloped nature; traversing hedgerow, which contained a gap that would only allow a maximum clearance of approximately 5 m between each wing tip and the hedgerow; trees over which the approach was made; and farm buildings at its south-eastern side, was not suitable for an aircraft landing.

The Pilot had not landed at the field before. He had looked at it from its road entrance approximately two years prior to the occurrence flight and had viewed satellite imagery of the field before departure. A plan-view satellite image would not reveal the sloping nature of the site. However, the Pilot noticed this aspect on the downwind leg, but did not consider it to be of significance at the time. An increased awareness of the effects of biases such as expectation bias and plan continuation bias on the decision making process, and how such biases can minimise the significance of cues suggesting a change in plan is warranted, could help prevent accidents similar to the subject event from occurring. The prudent course of action on viewing the field on the downwind leg would have been to abort the decision to land there, rather than pressing on with the original plan.

The Pilot reported that he "*misjudged the flare*" during the landing, causing the aircraft to land hard and bounce and that the rising ground on touch down may have been a factor. An upward sloping field may necessitate an earlier flare, because the rising ground effectively increases the sink rate as the aircraft descends towards the field. In this case, the up-slope of approximately 3 degrees would have had a significant adverse effect. The Pilot considered that the tailwind, which would have increased the aircraft's ground speed, was also a factor in the occurrence.

The aircraft's Flight Permit states that the "*the aircraft shall be flown strictly in accordance with the limitations, procedures and conditions contained in the applicable Aircraft Flight Manual*". The Investigation notes that the operating handbook used by the Pilot was not for the accident type, but for a similar variant of the aircraft. This was not a factor in the subject occurrence.

2.2 Subsequent Flight

The aircraft sustained substantial damage in the accident, which included possible shock loading of the engine. However, shortly after the occurrence and without a formal damage inspection performed by an approved aircraft maintenance engineer, a take-off was performed back down the hill and the aircraft was flown back to the airstrip in Co. Galway. Considering the damage to the aircraft and the now-known unsuitability of the site, which had limited options for a rejected take-off should the need have arisen, this course of action was not prudent and had the potential to result in a further, and possibly more serious, accident.

- END -

In accordance with Annex 13 to the Convention on International Civil Aviation, Regulation (EU) No. 996/2010, and Statutory Instrument No. 460 of 2009, Air Navigation (Notification and Investigation of Accidents, Serious Incidents and Incidents) Regulation, 2009, the sole purpose of this investigation is to prevent aviation accidents and serious incidents. It is not the purpose of any such investigation and the associated investigation report to apportion blame or liability.

A safety recommendation shall in no case create a presumption of blame or liability for an occurrence.

Produced by the Air Accident Investigation Unit

AAIU Reports are available on the Unit website at www.aaiu.ie



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