

AIRCRAFT ACCIDENT REPORT AND EXECUTIVE SUMMARY

				Reference:	CA18/2/3/9265	
Aircraft Registration	ZU-EFZ	Date of Accident	2 January 2014		Time of Accident	1140Z
Type of Aircraft	Bantam B22J		Type of Operation		Private	
Pilot-in-command Licence Type		Private	Age	32	Licence Valid	Yes
Pilot-in-command Flying Experience		Total Flying Hours	302.5		Hours on Type	200
Last point of departure		Nelspruit (FANS), Mpumalanga				
Next point of intended landing		Nelspruit (FANS), Mpumalanga				
Location of the accident site with reference to easily defined geographical points (GPS readings if possible)						
About 100 m from the runway threshold at The Rest airfield in the Nelspruit area, Mpumalanga (GPS co-ordinates: S25°32'34.94" E030°57'58.02" at an elevation of 3 020 ft)						
Meteorological Information		Temperature: 28°C, dew point: 15°C, wind: 070° at 7 kt				
Number of people on board	1 + 1	No. of people injured	0	No. of people killed	0	
Synopsis						
<p>The pilot and a passenger took off from Nelspruit on a private scenic flight in the area. The pilot then elected to perform a runway inspection flight at The Rest private airstrip as part of the scenic flight. The pilot flew low over the runway at The Rest airfield and during the climb-out, the pilot allowed the airspeed to decay, resulting in the aircraft stalling at a low altitude during the climb-out and subsequent ground impact.</p> <p>The pilot and passenger were not injured in the accident. The aircraft suffered damage to the fuselage, engine, propeller and wings.</p>						
Probable Cause						
<p>The pilot failed to maintain adequate airspeed causing the aircraft to enter into a stall from which the pilot was unable to recover</p>						
IARC Date				Release Date		



AIRCRAFT ACCIDENT REPORT

Name of Owner	: Jazz Spirit 1113 CC
Name of Operator	: Micro Aviation
Manufacturer	: Micro Aviation New Zealand Ltd
Model	: Bantam B22J
Nationality	: South African
Registration Marks	: ZU-EFZ
Place	: The Rest airfield, Nelspruit, Mpumalanga
Date	: 2 January 2014
Time	: 1140Z

All times given in this report are Co-ordinated Universal Time (UTC) and will be denoted by (Z). South African Standard Time is UTC plus 2 hours.

Purpose of the Investigation:

*In terms of Regulation 12.03.1 of the Civil Aviation Regulations (1997) this report was compiled in the interests of the promotion of aviation safety and the reduction of the risk of aviation accidents or incidents and **not to establish legal liability**.*

Disclaimer:

This report is produced without prejudice to the rights of the CAA, which are reserved.

1. FACTUAL INFORMATION

1.1 History of Flight

- 1.1.1 On 2 January 2014, the pilot and a passenger took off from Nelspruit (FANS) on a private scenic flight in the area.
- 1.1.2 The pilot reported that he performed a runway inspection fly-over over The Rest private airstrip with the intention to return to FANS. The pilot stated that during the climb-out over the private airstrip, the aircraft experienced a severe downdraught, which caused the aircraft to impact the ground.
- 1.1.3 The pilot and passenger were not injured during the accident sequence.
- 1.1.4 The accident occurred about 100 m from the runway threshold at The Rest airfield in the Nelspruit area, Mpumalanga, at GPS co-ordinates S25°32'34.94" E030°57'58.02", at an elevation of 3 020 ft, at 1140Z during daylight conditions.

1.2 Injuries to Persons

Injuries	Pilot	Crew	Pass.	Other
Fatal	-	-	-	-
Serious	-	-	-	-
Minor	-	-	-	-
None	1	-	1	-

1.3 Damage to Aircraft



Figure 1: Accident site

1.4 Other Damage

1.4.1 No other damage was reported.

1.5 Personnel Information

1.5.1 Pilot-in-command:

Nationality	South African	Gender	Male	Age	32
Licence Number	*****	Licence Type	Private		
Licence valid	Yes	Type Endorsed	Yes		
Ratings	None				
Medical Expiry Date	30 January 2018				
Restrictions	Hearing protection, Lasik protocol				
Previous Accidents	None				

1.5.2 Pilot-in-command flying experience:

Total Hours	302.5
Total Past 90 Days	30
Total on Type Past 90 Days	3.5
Total on Type	200

1.6 Aircraft Information

1.6.1 Airframe:

Type	Bantam B22J	
Serial Number	06-0293	
Manufacturer	Micro Aviation New Zealand Ltd	
Date of Manufacture	20 June 2006	
Total Airframe Hours (At time of Accident)	668.7	
Last MPI (Date & Hours)	22 November 2013	665.7
Hours since Last MPI	3	
Authority to fly (Expiry date)	21 November 2014	
C of R (Issue Date) (Present owner)	2 December 2013	
Operating Categories	Training	

1.6.2 Engine:

Type	Jabiru
Serial Number	22A2444
Hours since New	668.7
Hours since Overhaul	3

1.6.3 Propeller:

Type	Brent Thompson
Serial Number	504 64x30
Hours since New	3
Hours since Overhaul	TBO not reached

1.6.4 The aircraft maintenance organisation (AMO) that performed the last maintenance on the aircraft prior to the accident flight was in possession of a valid AMO approval certificate. All relevant aircraft documentation, such as the certificate of registration

(C of R), the authority to fly and the mass and balance certificates were inspected during the investigation and were found to be valid. The aircraft maintenance documentation was obtained from the AMO and inspected. All maintenance entries made in the logbooks were appropriately certified in terms of applicable regulations.

1.6.5 Weight and balance:

According to available documentation, the aircraft's last weight and balance calculation was performed on 14 December 2012. The pilot's operating handbook states that the maximum take-off weight of the aircraft is 450 kg. The weight and balance calculation of the aircraft was performed and is tabulated below. The weight of the aircraft was 55 kg below the maximum take-off weight of the aircraft.

Basic Empty Mass	217 kg
Private Pilot	75 kg
Passenger	78 kg
Fuel	25 kg
Total Weight	395 kg
Maximum Take-off Weight	450 kg

1.7 Meteorological Information

1.7.1 The following information was obtained from the South African Weather Service report:

Wind direction	070°	Wind speed	7 kt	Visibility	Unknown
Temperature	28°C	Cloud cover	FEW	Cloud base	020
Dew point	15°C				

1.7.2 There is no weather reporting station at The Rest airfield, so the information provided by the South African Weather Service was taken from the nearest airport that has weather reporting facilities, namely the Kruger Mpumalanga International Airport (FAKN).

1.7.3 The METARs for 1100Z and 1200Z for the FAKN weather station are shown below:

FAKN 021200Z 07007KT 9999 FEW020 28/15 Q1015 NOSIG=

FAKN 021100Z 06006KT 9999 FEW020 27/17 Q1016 NOSIG=

1.7.4 The 1200Z METAR for FAKN was closest to the time of the accident, and reported the following:

Dry-bulb temperature: 28°C

Dew-point temperature: 15°C

Wind direction and speed: 070° at 7 kt

Weather phenomena: NONE

Clouds amount and height: FEW at 2 000 ft

Pressure reduced to mean sea level: 1015 hPa

1.7.5 Figure 2 below shows a satellite image for 2 January 2014 at 1145Z. The red square shows the accident area.

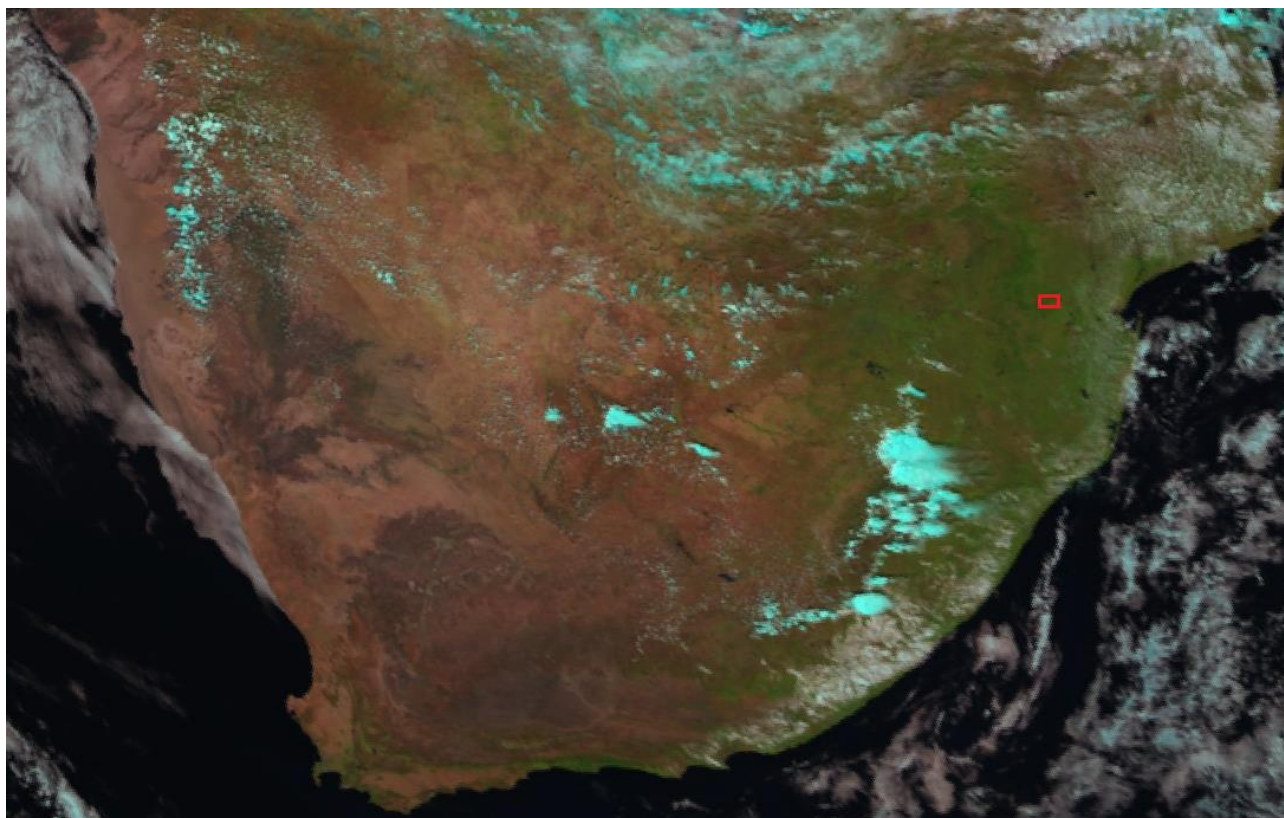


Figure 2: Satellite image

1.8 Aids to Navigation

1.8.1 The aircraft was fitted with the standard navigation equipment as required by the Regulator.

1.9 Communications

1.9.1 The aircraft was fitted with the standard communication equipment as required by the Regulator.

1.10 Aerodrome Information

Aerodrome Location	The Rest Airfield	
Aerodrome Co-ordinates	S25°32'34.94" E030°57'58.02"	
Aerodrome Elevation	2 870 ft	
Runway Designations	03/22	
Runway Dimensions	600 m x 20 m	
Runway Used	22	
Runway Surface	Grass	
Approach Facilities	None	

Note: The pilot conducted a runway fly-over without the intention of landing.

1.11 Flight Recorders

1.11.1 The aircraft was not fitted with a cockpit voice recorder (CVR) or flight data recorder (FDR), and neither was required by regulations to be fitted to this type of aircraft.

1.12 Wreckage and Impact Information

1.12.1 This was an off-site investigation.

1.12.2 The following were deduced from photographic evidence of the accident aircraft:

- 1.12.2.1 The wreckage was located about 100 m from the threshold of Runway 22 at The Rest airfield.
- 1.12.2.2 The damage that can be seen in Figure 1 and Figure 3 is consistent with an aircraft in a left-hand turn prior to impact with the ground.
- 1.12.2.3 The left-hand wing would have been the first part of the aircraft to impact the ground, followed by the engine of the aircraft.
- 1.12.2.4 The cabin area was damaged mostly in the area of the instruments and rudder pedals. The damage was mostly due to impact forces as well as the engine.
- 1.12.2.5 The right-hand wing shows signs of compression damage of an up-going wing.
- 1.12.2.6 The aft fuselage shows signs of compression damage to the right-hand side as can be seen in Figure 3.



Figure 3: Damage caused to the aircraft. The red arrow indicates ground impact of the down-going wing. The yellow arrow indicates damage to the aft fuselage.

1.13 Medical and Pathological Information

1.13.1 No injuries were reported.

1.14 Fire

1.14.1 There was no pre- or post-impact fire damage to the aircraft.

1.15 Survival Aspects

1.15.1 The accident was considered survivable due to the low impact forces associated with this accident.

1.16 Tests and Research

1.16.1 None considered necessary.

1.17 Organisational and Management Information

1.17.1 This was a private flight.

1.17.2 The aircraft manufacturing organisation was in possession of a valid approval certificate, number M628.

1.18 Additional Information

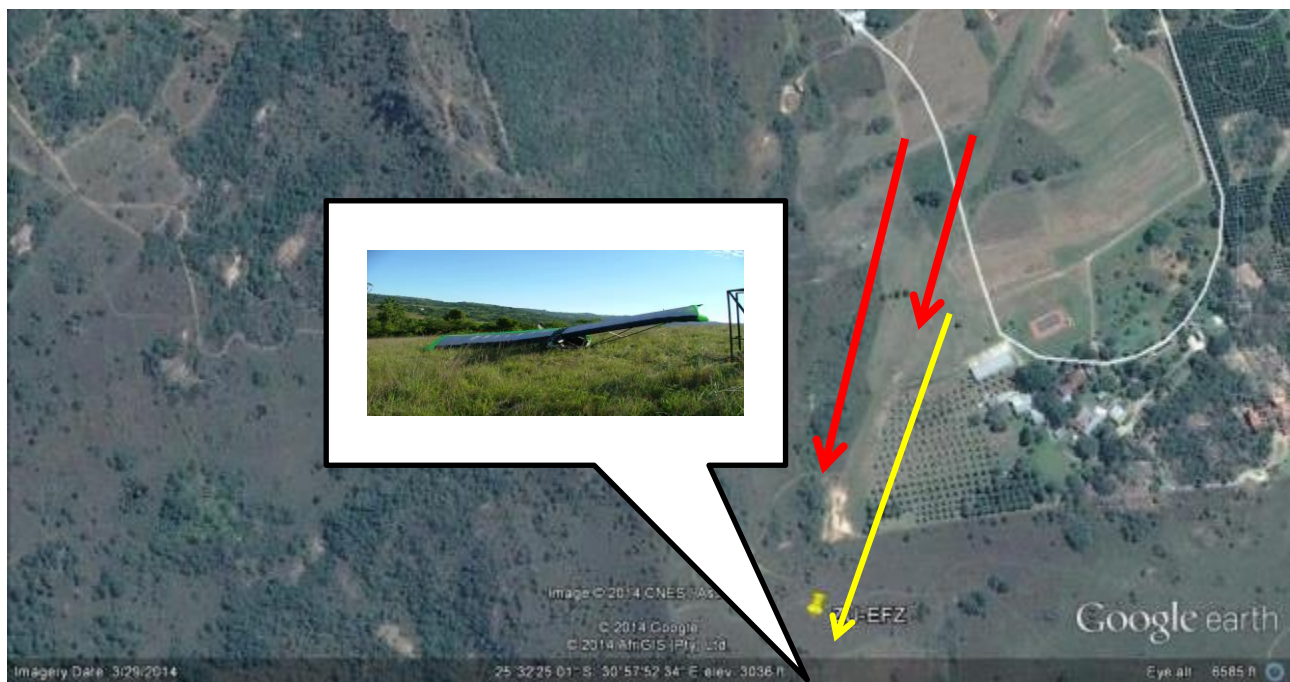


Figure 4: Red arrows indicate wind direction and yellow arrow indicates inspection run direction.

- 1.18.1 The effect of proper take-off speed is especially important when runway lengths and take-off distances are critical. The take-off speeds specified in the AFM/POH are generally the minimum safe speeds at which an aircraft can become airborne. Any attempt to take off below the recommended speed means that the aircraft could stall, be difficult to control, or have a very low initial rate of climb. In some cases, an excessive angle of attack (AOA) may not allow the aircraft to climb out of ground effect. In contrast, an excessive airspeed at take-off may improve the initial rate of climb and 'feel' of the aircraft, but will produce an undesirable increase in take-off distance. Assuming that the acceleration is essentially unaffected, the take-off distance varies with the square of the take-off velocity. Thus, 10% excess airspeed would increase the take-off distance 21%. In most critical take-off conditions, such an increase in take-off distance would be prohibitive; the pilot must adhere to the recommended take-off speeds. (Source: FAA *Pilot's Handbook of Aeronautical Knowledge* (10-18).
- 1.18.2 The compression damage found to the left wing of the accident aircraft (Figure 3, red arrow) is consistent with the damage caused when an aircraft enters a spin and the left wing impacts the ground, as shown in Figure 5.
- 1.18.3 The compression damage found on the aft fuselage of the accident aircraft (Figure 3, yellow arrow) is consistent with the damage caused when an aircraft that has been spinning impacts the ground, as shown in Figure 5.

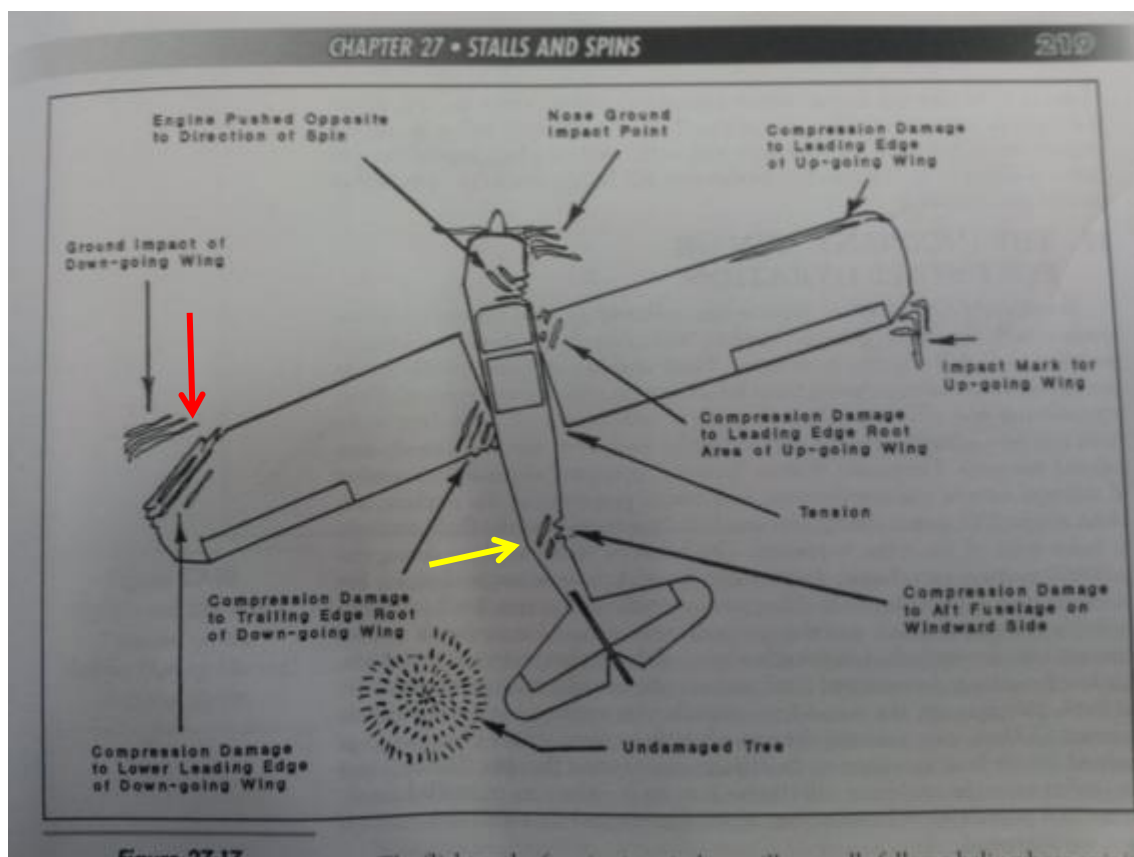


Figure 5: Damage typically found in a spinning aircraft.

1.19 Useful or Effective Investigation Techniques

1.19.1 None.

2. ANALYSIS

2.1 Pilot (Man):

- 2.1.1 The pilot was appropriately licensed for the flight. The runway inspection phase of the flight was conducted with a tailwind velocity of 7 kt. The pilot may have approached the runway at a higher ground speed, and this could have led him to lower his airspeed because he was visually accustomed to a lower ground speed. Due to obstacles (trees and rising terrain) beyond the threshold of Runway 22 and an excessive angle of attack to clear these obstacles, the aircraft was unable to climb out of ground effect.
- 2.1.2. The distance required to nullify the tailwind before any headwind was obtained for lift was increased and the climb angle was reduced. During the decision-making process, the pilot increased the angle of attack to clear the obstacles and thereby caused the airspeed of the aircraft to decay. This action by the pilot caused the aircraft to enter into a stall, with insufficient height to recover from the stall. The aircraft descended and subsequently impacted the ground.

2.2 Aircraft (Machine):

- 2.2.1 The aircraft was serviceable and maintained in accordance with the applicable regulations. The pilot's questionnaire did not state any mechanical reason for the accident.

2.3 Environment:

- 2.3.1 The tailwind velocity was 7 kt during the pilot's runway inspection flight. Trees and rising terrain in the area beyond the threshold of Runway 22 caused the pilot to increase the angle of attack of the aircraft in order to clear the obstacles, resulting in the aircraft stalling. The pilot stated that the aircraft experienced a downdraft prior to impact with the ground.

3. CONCLUSION

3.1 Findings

- 3.1.1 The pilot was licensed and qualified for the flight in accordance with existing regulations.
- 3.1.2 The maintenance records indicated that the aircraft was maintained in accordance with existing regulations and approved procedures.
- 3.1.3 The aircraft weight was calculated at 395 kg and was found to be within limits.
- 3.1.4 The pilot flew the aircraft with a 7 kt tailwind, which required an increased airspeed to maintain lift.
- 3.1.5 The pilot was distracted by the rising terrain at the threshold of Runway 22 and allowed his airspeed to decay.

3.1.6 The aircraft stalled with insufficient height to recover from the stall, resulting in the aircraft impacting the ground.

3.2 Probable Cause/s

3.2.1 The pilot failed to maintain adequate airspeed causing the aircraft to enter into a stall from which the pilot was unable to recover.

4. SAFETY RECOMMENDATIONS

4.1 None.

5. APPENDICES

5.1 None.