



AIRCRAFT ACCIDENT REPORT AND EXECUTIVE SUMMARY

				Reference:	CA18/2/3/9080	
Aircraft Registration	ZS-KMS	Date of Accident	12 September 2012		Time of Accident	0545Z
Type of Aircraft	Beech Baron 58P		Type of Operation	Private		
Pilot-in-command Licence Type	Commercial		Age	27	Licence Valid	Yes
Pilot-in-command Flying Experience	Total Flying Hours	1 145.7		Hours on Type	4.6	
Last point of departure	Pietermaritzburg airport (FAPM): Kwazulu Natal province.					
Next point of intended landing	Kruger Mpumalanga international (FAKN): Mpumalanga province.					
Location of the accident site with reference to easily defined geographical points (GPS readings if possible)						
Outside the boundary of Pietermaritzburg airport, approximately 200m from Runway 34 at GPS coordinates determined to be S29°39' 32.786 E030°24'30.527 at an elevation of 2423 feet above mean sea level (AMSL).						
Meteorological Information	Surface wind: 240°04 knots; Temperature: 19°C; Visibility: 200 metres					
Number of people on board	1 + 2	No. of people injured	0	No. of people killed	0	
Synopsis						
<p>The pilot reported that during the take-off roll from runway 16, an audible warning came on which he interpreted to be a turbo over boost warning. He mentioned that he confirmed all instrument readings to be normal, and continued with the take-off. Immediately after lift-off, the pilot stated that he retracted the landing gear. After retracting the landing gear the aircraft speed began to decrease and the aircraft lost altitude. The pilot further stated that he tried to correct the situation and gain altitude but was unsuccessful. The aircraft continued to lose altitude and crashed on an open field, approximately 400 metres from the threshold of runway 34. The aircraft sustained substantial damage and all the occupants escaped unharmed. The flight was conducted under the provisions of Part 135 of the Civil Aviation Regulations at the time of the accident.</p>						
Probable Cause						
<p>I. The pilot failed to maintain flying speed and stalled the aircraft.</p>						
IARC Date				Release Date		



AIRCRAFT ACCIDENT REPORT

Name of Owner/Operator : Treated Timber Products (PTY) LTD
Manufacturer : Raytheon Aircraft Company
Model : Beech Baron 58P
Nationality : South African
Registration Marks : ZS-KMS
Place : Outside Pietermaritzburg Airport
Date : 12 September 2012
Time : 0545Z

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 interest 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 given without prejudice to the rights of the CAA, which are reserved.

1. FACTUAL INFORMATION:

1.1 History of Flight:

1.1.1 On Wednesday 12 September 2012, the pilot of ZS-KMS aircraft accompanied by two passengers departed Pietermaritzburg (FAPM) aerodrome, bound for Kruger Mpumalanga (FAKN) International Airport under Instrument Flight Rules (IFR). According to the Air Traffic Controller on duty on the day of the accident visibility was very poor due to fog at 200m. ATC reported that at 0508z the pilot requested start clearance for a flight to FAKN at FL150. The start was approved at pilot's discretion. At 0523Z, ZS-KMS reported ready for departure. At 0527Z, ZS-KMS pilot was advised to take-off at his own discretion and report when airborne.

1.1.2 The pilot mentioned that he confirmed all instrument readings to be normal, and continued with the take-off. After lift-off, the pilot stated that he retracted the landing gear at approximately 300 feet above ground level (AGL). After retracting the landing gear the aircraft speed began to decrease and the aircraft began to lose altitude. According to the pilot he confirmed the manifold pressure and power levers to be in a normal take off position. He further stated that he tried to correct the situation and gain altitude but was unsuccessful. The aircraft continued to lose altitude and crashed on an open field, approximately 400 metres from the threshold

of runway 34.

- 1.1.3 The aircraft was substantially damaged and all three occupants evacuated the aircraft without assistance and were unharmed. Post interview with the pilot revealed that he performed pre departure checks and everything was normal. Prior to take-off he released the brakes and applied full power gradually. During the take-off roll, an audible warning came ON which he interpreted to be a turbo over boost warning.
- 1.1.4 The accident happened at approximately 0545Z, day light, on an open field, approximately 400 metres from the threshold of runway 34, at FAPM, at GPS position determined to be S29°39'32.786 E030°24'30.527 at an elevation of 2423 feet above mean sea level (AMSL).

1.2 Injuries to Persons

Injuries	Pilot	Crew	Pass.	Other
Fatal	-	-	-	-
Serious	-	-	-	-
Minor	-	-	-	-
None	1	-	2	-

1.3 Damage to Aircraft

- 1.3.1 The aircraft was substantially damaged after impact with the ground.



Figure 1: View of the aircraft as found at the accident site.

1.4 Other Damage:

1.4.1 Damage was limited to the aerodrome perimeter fence.

1.5 Personnel Information:

Nationality	South African	Gender	Male	Age	27
Licence Number	0271061954	Licence Type	Commercial		
Licence valid	Yes	Type Endorsed	Yes		
Ratings	Instrument Rating, Night Rating and Test Pilot Rating				
Medical Expiry Date	28 February 2013				
Restrictions	None				
Previous Accidents	Nil				

Flying Experience:

Total Hours	1 145.7
Total Past 90 Days	79.9
Total on Type Past 90 Days	29.6
Total on Type	4.6

1.6 Aircraft Information:

Aircraft description:

The Beechcraft Baron 58P is a light, twin-engine piston aircraft originally developed by Beech Aircraft Corporation and currently manufactured by the Hawker Beechcraft Corporation.



Figure 2: View of ZS-KMS aircraft taxiing (photo found on internet).

Airframe:

Type	Beech Baron 58P	
Serial Number	TJ-286	
Manufacturer	Beech Aircraft Corporation	
Date of Manufacture	1980	
Total Airframe Hours (At time of Accident)	3183.9	
Last MPI (Date & Hours)	06 June 2012	3144.5
Hours since Last MPI	39.4	
Certificate of Airworthiness (Issue Date)	06 November 2011	
Certificate of Airworthiness (Expiry Date)	02 July 2013	
C of R (Issue Date) (Present owner)	06 August 2008	
Recommended fuel used	Avgas LL 100	
Type of fuel used	Avgas LL 100	
Operating Categories	Standard Part 135	

L/H Engine:

Type	Continental IO-550C-31
Serial Number	684414
Hours since New	1664.5
Hours since Overhaul	TBO not yet reached

R/H Engine:

Type	Continental IO-550C-31
Serial Number	684423
Hours since New	1664.5
Hours since Overhaul	TBO not yet reached

L/H Propeller:

Type	Hartzell PHC-J3YF-2UF
Serial Number	ED 2364
Hours since New	3183.9
Hours since Overhaul	711.8

R/H Propeller:

Type	Hartzell PHC-J3YF-2UF
Serial Number	ED 2356
Hours since New	3183.9
Hours since Overhaul	711.8

1.7 Meteorological Information:

1.7.1 The South African Weather Service reported that, based on the observations at the two recording stations closest to the accident site, weather conditions were as follows:

Wind direction	240	Wind speed	4 Knots	Visibility	200m
Temperature	12°C	Cloud cover	Overcast	Cloud base	3500 ft
Dew point	-2°C				

1.8 Aids to Navigation:

1.8.1 The aircraft was equipped with standard navigation equipment. All the navigation equipment was serviceable prior to the accident.

1.9 Communications:

1.9.1 Communication equipment that was installed in the aircraft was found to be in accordance with the approved equipment list. There were no defects reported with the communication equipment prior to the accident.

1.10 Aerodrome Information:

1.10.1 The aircraft crashed on an open field, approximately 400m from the threshold of runway 34 at FAPM at a GPS position determined to be S29°39'32.786 E030°24'30.527 at an elevation of 2423 feet AMSL. Below is the aerodrome layout as per aeronautical information publication (AIP).

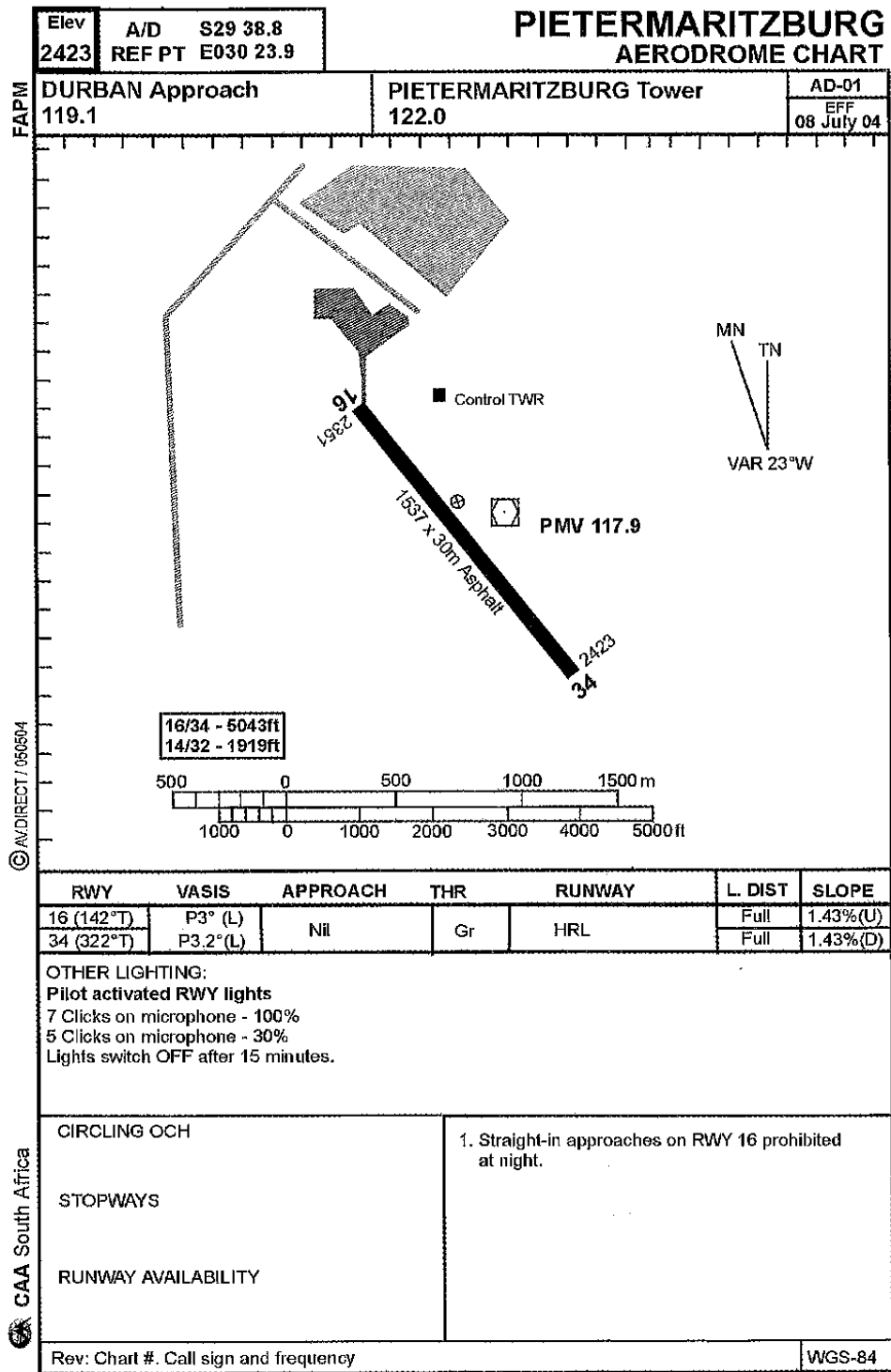


Figure 3: View of the aerodrome layout as per AIP where the aircraft took off.

1.11 Flight Recorders:

1.11.1 The aircraft was not fitted with a Flight Data Recorder (FDR) or a Cockpit Voice Recorder (CVR), nor was it required by regulation.

1.12 Wreckage and Impact Information:

1.12.1 The accident occurred on an open field, approximately 400 metres from runway 34 threshold. The aircraft was on an easterly heading on impact. The aircraft's initial impact point was a steel pole which ripped the right wing off, and the aircraft skidded over the field for approximately 130 meters before it came to a stop and went through a fence before coming to rest.

1.12.2 Flight control cable continuity and pre-impact control integrity could be established at the accident site. There was no evidence of any flight control problem or jamming. Damage was limited to the propellers, the undercarriage, the underbelly and the right wing. The flap lever in the cockpit and the flaps were found on the UP position. The cabin/ cockpit area was still intact and the battery was found in an OFF position. The undercarriage lever was on the UP position but still in transit with the fuel selector valve in an OFF position. All the aircraft seats were secured on their anchors with the safety harnesses still secured and not failed/snapped. Below is a photo of the aircraft shot during recovery.



Figure 4: View of the aircraft shot during recovery.

1.13 Medical and Pathological Information:

1.13.1 The pilot and passengers sustained no injuries as a result of the accident.

1.14 Fire:

1.14.1 There was no evidence of a pre or post impact fire.

1.15 Survival Aspects:

1.15.1 The accident was considered to be survivable due to low kinetic forces prior to impact. The aircraft cockpit/cabin area was intact.

1.16 Tests and Research:

1.16.1 On-site investigation revealed that the aircraft collided with a steel pole which ripped the right wing off, and the aircraft skidded over the field for approximately 130 meters before coming to a halt. In addition the EDM-760 monitor gave indication that the aircraft has travelled 58 seconds from take-off to the first point of impact. In a nut shell the distance the aircraft has travelled and time before collision with a steel pole clearly shows that the aircraft engines were producing a significant amount of power. If that was not the case the aircraft should have come to a standstill immediately after collision with the steel pole (and not have travelled such a long distance).

1.16.2 Secondly a clear right wing tip cut is an indication that the engines were producing a significant amount of power from take-off up to the last point of impact.



Figure 5: View of the right hand wing.

1.16.3 The wreckage revealed that all of the structural damages were consistent with the impact, nothing was found to suggest that there had been any pre-impact failure of the primary structure. The fuel tanks ruptured after impact and damage was limited to the vegetation caused by fuel spillage.

1.16.4 Examination of the engines and propellers:

- i. The aircraft is equipped with the Engine Data Management (EDM)-760 monitor. After the accident the EDM-760 monitor was downloaded and all parameters on both engines were consistent with both engines operating normally. **NOTE: An EDM-760 is a device used to monitor engine performance and can monitor up to twenty-four critical measurements, three times a second, with a linearized thermocouple accuracy of better than 0.1 % or 2 degrees. It is a backup instrument and continuously watching over the engines while the pilot concentrates on flying the aircraft. The EDM-760 system is the most advanced and accurate piston engine-monitoring instrument. All EDM-760 systems come with data recording and provide long term trend monitoring to maintain ultimate engine health. Data recording capability will record and store all displayed parameters. The data will be saved to a computer in a compressed format file. The EDM-760 will warn the pilot instantly if any parameter exceeds the programmed limit: Below is the picture of the EDM-760 monitor.*



Figure 6: View of a twin six cylinder EDM-760 monitor.

- ii. Examination of the propellers did not reveal any pre-impact mechanical abnormalities. In addition, the observed marks and damage confirmed that the propellers were in a positive angle and receiving power from the engines on impact.

1.17 Organizational and Management Information:

1.17.1 This was a private flight, and the aircraft was privately owned.

1.17.2 The last Mandatory periodic inspection (MPI) that was carried out on the aircraft was certified on 06 June 2012 at 3144.5 hours.

1.18 Additional Information:

1.18.1 None.

1.19 Useful or Effective Investigation Techniques:

1.19.1 None.

2. ANALYSIS:

2.1 Available information obtained from the ATC who was on duty at the time of the accident revealed that poor visibility prevailed at the time the aircraft was attempting to take off and subsequent accident. The aircraft was properly maintained in accordance with the manufacturer specifications and available documentation did not reflect any defect or malfunction that could have contributed or have caused the accident.

2.2 The pilot was in possession of a valid commercial pilot license as well as a valid aviation medical certificate that was issued by a SA CAA accredited medical examiner at the time of the accident. The pilot was appropriately rated and had a total of 4.6 hours on aircraft type.

2.3 Examination of the wreckage revealed that the aircraft was intact before colliding with a steel pole and subsequent ground impact. A thorough examination and analysis of the engines and the propellers revealed that there were no deficiencies with the aircraft prior the accident. In addition the EDM-760 monitor downloaded revealed that both engines were operating normally. The investigation revealed premature retraction of the landing gear by the pilot, created higher aerodynamic drag during take-off rendering ground impact inevitable.

3. CONCLUSION:

3.1 Findings:

- 3.1.1 The pilot held a valid commercial pilot's license, with the aircraft type endorsed in his log book.
- 3.1.2 The pilot had the required ratings at the time of the accident.
- 3.1.3 The weather conditions were poor, visibility of 200m in fog.
- 3.1.4 The aircraft had a valid Certificate of Airworthiness at the time of the accident.
- 3.1.5 The accident occurred in daylight conditions.
- 3.1.6 All control surfaces were accounted for; there was no evidence of pre-impact failure or malfunction of the aircraft's structure, power plant, flight controls or other systems.

3.2 Probable Cause/s:

- 3.2.1 The pilot failed to maintain flying speed.

3.3 Contributing factor/s.

- 3.3.1 Premature retraction of undercarriage by the pilot following rotation

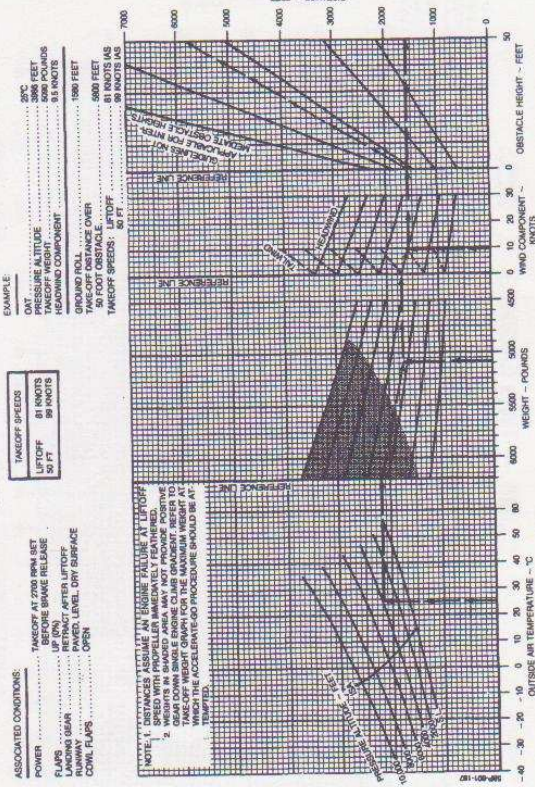
4. SAFETY RECOMMENDATIONS:

- 4.1 None.

5. APPENDICES:

- 5.1 Aircraft performance as per pilot operating handbook POH
Section V Performance and section IV shows normal procedures
8. Refers to Flaps
Accelerate-go (Associated conditions)
Flaps.....up (0%)

ACCELERATE — GO



December, 1978

5-29

1. Seat Belts and Shoulder Harnesses - CHECK
2. Parking Brake - SET
3. Engine Warm-up - 1000 TO 1500 RPM
4. Fuel Selectors - CROSSFEED (for 10-15 seconds)
5. Fuel Selectors - RETURN BOTH TO ON POSITION
6. Flight Controls - CHECK PROPER DIRECTION AND FREEDOM OF MOVEMENT
7. Instruments - CHECK, NORMAL INDICATION AND SET
8. Flaps - CHECK OPERATION
9. Autopilot - CHECK
10. Electric Trim - CHECK OPERATION
11. Trim - SET TO TAKE-OFF RANGE
12. Throttles - 2000 RPM (75°F Oil Temperature - MINIMUM)
13. Magnetos - CHECK (150 rpm maximum drop within 50 rpm of each other.)

NOTE

Avoid operation on one magneto for more than 5 to 10 seconds.

14. Pressurization - CHECK AND SET
15. Throttles - 1500 RPM
16. Propellers - FEATHER CHECK (No more than 500 rpm drop) Repeat 2 to 3 times in cold weather
17. Starter Energized Warning Light (if installed) - CHECK; should be illuminated during start and extinguished after start. If light is not installed or is inoperative, monitor loadmeters for proper indications.

4-12

August, 1980

Compiled by:

Date: 19/02/2013

For: Director of Civil Aviation

Investigator-in-charge:

Date: