AIRCRAFT ACCIDENT REPORT AND EXECUTIVE SUMMARY

			Reference:		CA18/2/3/9797	
Aircraft Registration	**ZU-IJP**	**Date of Accident**	11 June 2019		**Time of Accident**	1330Z
Type of Aircraft	Radial Rocket		**Type of Operation**		Proving Flight (Part 24)	
Pilot-in-command Licence Type	Commercial Pilot Licence		**Age**	59	**Licence Valid**	Yes
Pilot-in-command Flying Experience	Total Flying Hours		1894		Hours on Type	3
Last Point of Departure	Krugersdorp Aerodrome (FAKR); Gauteng Province					
Next Point of Intended Landing	Baragwanath Airfield (FASY); Gauteng Province					
Location of the accident site with reference to easily defined geographical points (GPS readings if possible)						
Baragwanath Airfield, at GPS position determined to be S26˚20´54.65˝ E27˚46´41.62˝ at an elevation of 5 423ft						
Meteorological Information	Wind direction: 160˚; Wind speed: 02kts; CAVOK; Temperature: 20˚C					
Number of People on-board	1+1	**No. of People Injured**	0	**No. of People Killed**	0	
Synopsis						

On 11 June 2019, an aircraft took off on a test flight with the pilot and the passenger on-board from Krugersdorp Aerodrome to Baragwanath Airfield. When the aircraft approached Baragwanath Airfield, the pilot prepared for the landing roll. The final approach was uneventful. The pilot stated that as the aircraft touched down on Runway 13 at approximately 1330Z during the landing roll, it veered off to the left of the runway and on to a rough terrain.

The aircraft sustained damage to the propeller and undercarriage. The pilot and the passenger did not sustain any injuries.

After the accident, the pilot stated that his landing speed was 100 miles per hour, which is 86 knots. According to the aircraft flight manual, the landing speed should be 75 knots per hour, thus, the aircraft speed during landing was exceeded by 11 knots.

The investigation revealed that the aircraft landed at high speed, resulting in a hard landing on all three gears, which caused the tail gear to bend to the left.

SRP Date	21 January 2020	Publication Date	14 February 2020

ABBREVIATIONS	DEFINITIONS
°C	Degrees Celsius
AIID	Accident and Incident Investigations Division
AMO	Aircraft Maintenance Organisation
CAR	Civil Aviation Regulations
CAVOK	Ceiling and Visibility Okay
C of A	Certificate of Authority
C of R	Certificate of Release
CVR	Cockpit Voice Recorder
FAKR	Krugersdorp Aerodrome
FASY	Baragwanath Airfield
FDR	Flight Data Recorder
ft	feet
GPS	Global Positioning System
kts	Knots
M	Metres
MPI	Major Periodic Inspection
QNH	Query Nautical Height
TBO	Time Before Overhaul
UTC	Co-ordinated Universal Time
VFR	Visual Flight Rules

Reference Number	**:** CA18/2/3/9797
Name of Owner/Operator	**:** Frascada Projects CC
Manufacturer	**:** Altitude Group LLC
Model	**:** Radial Rocket
Nationality	**:** South African
Registration Marks	**:** ZU-IJP
Place	**:** Baragwanath Airfield, at GPS position determined to be 26˚20´54.65˝ S, 27˚46´41.62˝ E and at an elevation of 5 423ft
Date	**:** 11 June 2019
Time	**:** 1330Z

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 (CAR) 2011, 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 apportion blame or liability****.*

Investigations process:

The accident was notified to the Accident and Incident Investigations Division (AIID) on 11 June 2019 at about 1355Z. The investigator/s did not dispatch for this accident. The (AIID of the South African Civil Aviation Authority (SACAA) is leading the investigation as the Republic of South Africa is the State of Occurrence.

Notes:

1. Whenever the following words are mentioned in this report, they shall mean the following:

- *Accident – this investigated accident*
- *Aircraft – the* Radial Rocket *model involved in this accident*
- *Investigation – the investigation into the circumstances of this accident*
- *Pilot – the pilot involved in this accident*
- *Report – this accident report*

2. Photos and figures used in this report are taken from different sources and may be adjusted from the original for the sole purpose of improving clarity of the report. Modifications to images used in this report are limited to cropping, magnification, file compression; or enhancement of colour, brightness, contrast; or addition of text boxes, arrows or lines.

Disclaimer:

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

1. FACTUAL INFORMATION

1.1. History of Flight

1.1.1 On 15 May 2019, a Radial Rocket aircraft with registration ZU-IJP took off on its first test flight after being manufactured. The flight was uneventful; it lasted approximately 30 minutes. However, during landing, the aircraft landed hard but continued to taxi until it stopped.

1.1.2 After the hard landing, a thorough inspection was carried out on the aircraft, including the tail gear assembly. No obvious damage was found.

1.1.3 On 8 June 2019, the aircraft was flown again for two hours with five landings and two full stop landings, which were uneventful.

1.1.4 On 11 June 2019, a pilot and a passenger took off from Krugersdorp Aerodrome (FAKR) on a proving flight to perform touch-and-go landings with a passenger in the rear seat, and thereafter, to land at Baragwanath Airfield (FASY). The entire flight was uneventful and was conducted under visual flight rules (VFR).

1.1.5 The pilot stated that he conducted three touch-and-go landings at FASY which were uneventful. On the fourth landing, which was to be a full stop landing, he landed the aircraft on Runway 13 and, during the landing roll, the aircraft veered off to the left-hand side of the runway and on to a rough terrain. The pilot further stated that he took standard corrective action which included steering and breaking as best as possible, but the aircraft continued to veer off to the left, resulting in the left main wheel gear getting into a ditch. The aircraft sustained damage to the left- and right-hand main landing gears, tail gear, bottom of the left-hand wing and all three propeller blades.

Figures 1 and 2: Show damage on the aircraft. (Source: Pilot)

1.1.6 Both occupants were not injured in the accident sequence.

1.1.7 The accident occurred during daylight conditions at a geographical position determined to be S26°20'53.44" E027°46'47.37" at an elevation of 5 423 feet (ft).

Figure3: Google Earth map of the accident site.

1.2. Injuries to Persons

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

1.2.1 Civil Aviation Regulations (CAR) 2011 Part 23.02.3(11) states the following.

Proving flight authority

(11) Only essential crew members, including those persons assigned to carry out in-flight inspections, may be carried on-board the aircraft during flights conducted in terms of a proving flight authority.

1.3. Damage to Aircraft

1.3.1 The aircraft sustained substantial damage.

1.4. Other Damage

1.4.1 None.

1.5. Personnel Information

Nationality	South African	Gender	Male	Age	59
Licence Number	**********	Licence Type	Commercial Pilot Licence		
Licence Valid	Yes	Type Endorsed	Yes		
Ratings	Night Rating and Instructor Grade 3				
Medical Expiry Date	31 March 2020				
Restrictions	Wear corrective lenses				
Previous Accidents	None				

Flying Experience:

Total Hours	1894
Total Past 90 Days	39.6
Total on Type Past 90 Days	3
Total on Type	3

1.5.1 The pilot had been issued Class 1, 2 and 4 medical certificates on 5 April 2019. Class 1 & 2 medical certificates were to expire on 30 April 2020 and Class 4 was to expire on 30 April 2022. The pilot had a total of 650 hours on tail-dragger aircraft.

1.6. Aircraft Information

1.6.1 This was a newly built aircraft and the first of its type in South Africa. It had accumulated a total of 3.6 airframe hours at the time of the accident. On 19 July 2011, the aircraft was issued with built number 766.

Airframe:

Type	Radial Rocket	
Serial Number	118	
Manufacturer	Altitude Group LLC	
Date of Manufacture	2016	
Total Airframe Hours (At time of Accident)	3.6	
Last MPI (Date & Hours)	Aircraft New	0.0
Hours since Last MPI	N/A	
Proving Flight Authority to Fly (Issue Date)	13 May 2019	
Authority to Fly (Expiry Date)	12 November 2019	
C of R (Issue Date) (Present owner)	14 September 2016	
Operating Categories	Part 94	

Engine:

Type	Vedeneyev M14P
Serial Number	222028
Hours Since New	3.6
Hours Since Overhaul	TBO not reached

Propeller:

Type	MTV-9-K-C
Serial Number	140248
Hours Since New	3.6
Hours Since Overhaul	TBO not reached

1.7. Meteorological Information

1.7.1 The information below was taken from the pilot questionnaire.

Wind direction	160˚	Wind speed	02kts	Visibility	CAVOK
Temperature	20˚C	Cloud cover	None	Cloud base	N/A
Dew point	5˚C	QNH	N/A		

1.8. Aids to Navigation

1.8.1 The aircraft was equipped with standard navigation equipment. There were no recorded defects in the navigation equipment prior to the accident.

1.9. Communication

1.9.1 The aircraft was equipped with standard communication equipment as per minimum equipment list (MEL) approved by the Regulator (SACAA). There were no recorded defects prior to the accident.

1.10. Aerodrome Information

Aerodrome Location	FASY	
Aerodrome Co-ordinates	S26°20'54.49" E27°46'44.94"	
Aerodrome Elevation	5 393 feet	
Runway Designations	13/31	N/A
Runway Dimensions	1000m X 25m	N/A
Runway Used	13	
Runway Surface	Tar	

1.11. Flight Recorders

1.11.1 The aircraft was neither equipped with a flight data recorder (FDR) or a cockpit voice recorder (CVR), nor were these required to be fitted by regulation.

1.12 Wreckage and Impact Information

1.12.1 The aircraft veered off the runway to the left, resulting in the left main wheel getting into a ditch. The aircraft sustained damage to the left- and right-hand main landing gears, tail gear, bottom of the left-hand wing and all three propeller blades.

1.13 Medical and Pathological Information

1.13.1 None.

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 survivable as the cockpit and cabin areas remained intact, and there was no damage that could have caused injuries to the occupants.

1.16 Tests and Research

1.16.1 The aircraft was landed at a speed of 86 knots. The aircraft flight manual states that the landing speed required for landing this aircraft is 75 knots, thus, the aircraft speed during landing was exceeded by 11 knots.

1.17 Organisational and Management Information

1.17.1 This was a newly built and assembled aircraft by the manufacturer, Frascada Projects CC, and was the first of its type in South Africa. The built number CAA09763 for manufacturer was issued on 19 July 2011.

1.17.2 Aircraft Maintenance Organisation (AMO) 1168, which carried out the inspection following the assembly of the aircraft, was issued the AMO approval on February 2019 with an expiry date of February 2020.

1.18 Additional Information

1.18.1 South African Civil Aviation Regulations, 2011

Part 24
SUBPART 2: AUTHORITY TO FLY, PROVING FLIGHT AUTHORITY AND SPECIAL FLIGHT PERMIT

24.02.3 (11 & 15)

Proving flight authority.

(11) Only essential crew members, including those persons assigned to carry out in-flight inspections, may be carried on-board the aircraft during flights conducted in terms of a proving flight authority.

(15) Apart from any conversion training, which may be required in terms of sub-regulation (14), no flight training may be conducted on an aircraft, operated in terms of a proving flight authority.

1.19 Useful or Effective Investigation Techniques

1.19.1 None.

2. ANALYSIS

2.1. General

From the available evidence, the following analysis was made with respect to this accident. These shall not be read as apportioning blame or liability to any particular organisation or individual.

2.1.1 Man

The pilot was in possession of a valid Commercial Pilot Licence (CPL) and a valid medical certificate with corrective lenses restriction.

The pilot carried a passenger during a proving flight, which was in contravention of the CAR 2011, Part 24.02.3(11).

2.1.2 Aircraft

This was a newly built aircraft and the first of its type in South Africa. It had accumulated a total of 3.6 airframe hours at the time of the accident. The assembly of the aircraft was carried out by a certified AMO number 1168 and the first test flight was carried out on 15 May 2019.

Approximately four weeks before the accident, the aircraft had a hard landing, but no evident damage was observed post the incident. On the day of the accident, the aircraft was landed with a speed 11 knots higher than the recommended landing speed of 75 knots. Therefore, it is possible that the aircraft landed hard on all three gears, resulting in the tail gear bending to the left. Once the tail gear was bent, the pilot lost control and the aircraft veered off to the left before coming to rest in a ditch next to the runway.

2.1.3 Mission

The aircraft was on a proving flight in which the pilot conducted three successful touch-and-go landings. On the fourth landing which was to be a full stop landing, the aircraft veered off to the left-hand side of the runway and into a rough terrain.

3. CONCLUSION

Findings

3.1 The pilot was issued a CPL on 19 January 2012 with an expiry date of 31 March 2020. The pilot completed his skills test on 9 February 2019 at Springs Airfield.

3.2 The pilot was the holder of a valid aviation medical certificates (Class 1, 2 & 4), which were issued on 5 April 2019. Class 1 & 2 had an expiry date of 30 April 2020 and Class 4 had an expiry date of 30 April 2022.

3.3 The pilot had accumulated a total of 1894 flying hours, of which three hours were on the aircraft type.

3.4 This was a newly built aircraft and the first of its type in South Africa. It had accumulated a total of 3.6 airframe hours at the time of the accident. The pilot stated that during the landing roll, the aircraft veered off to the left-hand side of the runway.

3.5 The aircraft was issued a Proving Flight Authority to Fly on 8 April 2019, with an expiry date of 12 November 2019.

3.6 The aircraft was landed at 86 knots per hour, which exceeded the recommended speed by 11 knots.

3.7 The flight was conducted under VFR conditions with wind direction of 160˚ and wind speed of 2 knots.

3.8 Both occupants were not injured in the accident sequence.

3.9 The investigation revealed that the aircraft landed at high speed, resulting in a hard landing on all three gears which caused the tail gear to bend to the left.

3.10 The pilot did not adhere to CARs with respect to carrying a passenger during a proving flight.

4. Probable Cause/s

4.1 The aircraft landed at high speed, resulting in a hard landing on all three gears which caused the tail gear to bend to the left.

4.2 **Contributory Factors:**

4.2.1 None.

5. SAFETY RECOMMENDATIONS

5.1 None.

6. APPENDICES

6.1 Appendix 1: Radial Rocket flight manual page 10 of 13.

Appendix 1

Radial Rocket flight manual page 10 of 13.

Know the limitation on your Radial Rocket TD and yourself.

EMERGENCY SPIN RECOVERY

- POWER OFF
- STICK FORWARD / AILERONS NEUTRAL
- DETERMINE DIRECTION OF SPIN ROTATION
- APPLY FULL OPPOSITE RUDDER
- WHEN ROTATION STOP, RECOVER

Landing

- Prop	High RPM
- Fuel quantity	CHECK
- Approach speed	75 kt

Three point landing shall be performed
On cross-wind landing, develop the habit of removing the crab before touchdown to avoid possible ground-loop.

Engine shut down

After landing and taxing.
- Run the engine at 1200 RPM for 1 minute. Prop to full forward if not already there.
- Shut down engine with the ignition switches to off position, one at a time.
- Close or Pull out the oil shut off valve.
- With master switch on, flip the oil scavenge switch up and allow the pump to run until starts to skip, about 5 minutes. Then turn scavenge pump OFF and master OFF.
- Pull the fuel shut off valve.
- All switches OFF.
- Close the air start cylinder valve.
- Open the air compressor separator valve. (Snot Valve) Place a cup below the drain on the valve.
- Open the lower cylinders drain valve. Place a cup below the drain valve.
- Hang cups on the exhaust pipe ends to catch dripping oil.

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