

THE REPUBLIC OF KENYA



MINISTRY OF ROADS AND TRANSPORT

STATE DEPARTMENT FOR TRANSPORT

AIRCRAFT ACCIDENT INVESTIGATION DEPARTMENT

A SERIOUS INCIDENT TO THE AIRCRAFT 5Y- CFG,

CESSNA 172 RG ON 16 NOVEMBER 2021

AT MAGADI AIRSTRIP, KAJIADO COUNTY

PRELIMINARY SERIOUS INCIDENT REPORT SUMMARY

OPERATOR	:	Private
AIRCRAFT TYPE	:	Pipistrel Virus-912
AIRCRAFT MANUFACTURER	:	Pipistrel-Hungary.
YEAR OF MANUFACTURE	:	2004
AIRCRAFT REGISTRATION	:	5Y- CFG
AIRCRAFT SERIAL NUMBER	:	135V9120304
DATE OF REGISTRATION	:	19 November 2014
NUMBER AND TYPE OF ENGINE	:	1, Rotax 912
DATE OF OCCURRENCE	:	13 November 2021
LAST POINT OF DEPARTURE	:	Riara, Limuru (-1.1007° S, 36.6906° E)
POINT OF INTENDED LANDING	:	Magadi Airstrip, Kajiado County (-1.9477806°N, 36.2801156° E)
TIME OF OCCURRENCE	:	1215 (1515)
LOCATION OF OCCURRENCE	:	Magadi, Kajiado County (-1.91866°N, 36.282129°E)
TYPE OF FLIGHT	:	Private
PHASE OF FLIGHT	:	Approach
NUMBER OF PERSONS ON BOARD	:	2 (Two)
INJURIES	:	None
NATURE OF DAMAGE	:	Minor
CLASS OF OCCURRENCE	:	Serious incident
PILOT IN COMMAND	:	PPL holder
PIC's FLYING EXPERIENCE	:	700Hours

All times given in this report is Coordinated Universal Time (UTC), with East African Local Time in Parenthesis

OBJECTIVE

This preliminary report contains factual information that has been determined up to the time of publication. The information in this report is published to inform the aviation industry and the public of the general circumstances of the accident.

This investigation has been carried out in accordance with The Kenya Civil Aviation (Aircraft Accident and Incident Investigation) Regulations, 2018, and Annex 13 to the ICAO Convention on International Civil Aviation.

The sole objective of the investigation of an accident or incident under these Regulations shall be the prevention of accidents and incidents. It shall not be the purpose of such an investigation to apportion blame or liability.

The information contained in this report is derived from the data collected during the preliminary investigation of the serious incident.

INVESTIGATION PROCESS

The occurrence involving a Pipistrel Virus-912, passenger aircraft, registration 5Y-CFG was notified to the Aircraft Accident Investigation Department (AAID), State Department for Transport (SDT) of the Ministry of Transport, Infrastructure, Housing, Urban development, and Public Works through a phone call by the pilot in command.

Under the provisions of Annex 13 to the Convention on International Civil Aviation, Kenya civil aviation act, and regulations, a team of AAID investigators was deployed to the site on 18 November 2021 to conduct initial onsite investigation and witness interviews.

After the initial on-site investigation phase, the occurrence was classified as a serious incident due to the nature of the damage to the aircraft.

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LIST OF ABBREVIATIONS/GLOSSARY OF TERMS

AAID	-	Aircraft Accident Investigation Department
AMSL	-	Above Mean Seal Level
CPL	-	Commercial Pilots' License
ELT	-	Emergency Locator Beacon
FIC	-	Flight Information Center
ft	-	Foot (feet)
ICAO	-	International Civil Aviation Organization
KCAA	-	Kenya Civil Aviation Authority
LH	-	Left Hand
NM	-	Nautical miles
RH	-	Right Hand
VFR	-	Visual Flight Rules

**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 the 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.*

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SYNOPSIS

On 16 November 2021 a Pipistrel Virus-912, privately operated, registration 5Y- CFG, took off from Riara in Limuru, Kiambu County at 0428 (0728) on a private flight to Magadi Airstrip, Kajiado County and crash-landed in Magadi on approach at Magadi Airstrip, after being struck by a gust of wind. The pilot made an emergency landing in a nearby field at 1215 (1515) on a location of 1.91866°N, 36.282129°E

Visual meteorological conditions prevailed for the flight, which was not operated on a flight plan. The aircraft was substantially damaged and the pilot and her passenger escaped with no injuries.

The investigation concluded the probable cause of the serious incident to the pilot's inadequate situation assessment and erroneous decisions leading to the aircraft crash-landing in an area around Magadi.

1.0 FACTUAL INFORMATION

1.1 History of the Flight

On 13 November 2021, a Cessna 172RG registration 5Y-CFG operated privately operated was involved in a serious incident in Magadi at about 1200 (1500). Onboard was a pilot and her passenger who took off from Riara Airstrip in Limuru, Kiambu County at 1030 (1330) on a VFR flight to Magadi Airstrip, Kajiado County for sightseeing over the rift valley.

On the pilot's recount of events, the takeoff from Riara airstrip and the subsequent flight over rift valley was uneventful until the long approach to the airfield in Magadi when she experienced a strong downdraft due to turbulence. Realizing that she was too low, and could not make it to the airfield, the pilot decided to land in the bush area to the east of Magadi airstrip. The aircraft impacted the ragged terrain heavily with hard breaking, consequently, the nose wheel broke off and the bolts at the lower end of the nose strut snapped while the nose wheel fork separated from the assembly. The left wing broke off from the main wreckage and was located about 32metres from the initial point of impact.

The pilot then shut off the fuel valve and the main switch. The pilot and her passenger escaped with no injuries and there was no pre or post-impact fire.

The aircraft was substantially damaged.

At the time of the occurrence, the weather comprised no significant rains, moderate winds, broken clouds, and good visibility. The recorded weather during that period posed insignificant aviation hazards.



Figure 1: The accident Aircraft viewed from the LH side.



Figure 2: The accident Aircraft after viewed from the AFT side



Figure 3: Location of the Occurrence around Lake Magadi



Figure 4: Section of the RH wing showing the fuel spillage



Figure 5: The Engine section with the cowling opened.



Figure 6: LH of the accident aircraft with the wing detached



Figure 7: Broken Propeller blade



Figure 8: Section of the Cockpit



Figure 9: Front Section of the accident aircraft

1.2 Injuries to Persons

Table 1-1: Injury chart

<i>Injuries</i>	<i>Crew</i>	<i>Passengers</i>	<i>Others</i>
Fatal	0	0	0
Serious	0	0	0
Minor/None	1	1	

1.3 Damage to Aircraft

The aircraft impacted the terrain about 2.3kilometres east of the Magadi airstrip. As shown in Figures 1 & 2, the main wreckage, which included fuselage, engine, and the right-wing came to rest on the rugged terrain. The left-wing had separated from the fuselage and was located adjacent to the main wreckage. The empennage broke but was still attached to the fuselage. The forward

portion of the fuselage was largely intact, with the cockpit doors intact. Both the propeller blades broke mid-span and were located within the wreckage radius (See Figure 9). The left and right-wing flaperons remained attached to the wing. The rudder and elevators remained attached to the empennage. Flight continuity was confirmed at the rudder and elevators. Discontinuities in the remainder of the flight control system appeared consistent with separations due to the impact sequence

A post-accident examination of the engine was conducted by AAID Investigators did not reveal any anomalies related to the cylinders, crankshaft, or valve train

1.4 Other Damage

Not applicable.

1.5 Personnel Information

1.5.1 Pilot

At the time of the incident, the 52-year-old female pilot held a valid PPL (Aeroplane) first issued on 20 May 2012 with a single-engine aeroplane rating. The pilot's most recent medical examination was conducted on October 5, 2021. On that application, the pilot indicated a total flight time of 679 hours, with 31 hours acquired during the previous 6 months.

Table 1-2: Summary of the pilot’s relevant information

D.o.B/Age	3 March 1969 (52 Years)
Sex	Female
Nationality	American
Type of License	PPL
Issuing Authority	KCAA
Date of issue	18 May 2021
Validity of License	21 May 2022
Total Flying hours	700
Total hours on type	600
Ratings	Pipistrel Virus-912
Total last 90 days (hours)	13hours
Total last 60 days (hours)	7hours

Total last 7 days (hours)	Nil
Total last 24 Hours (hours)	Nil
Medical Certificate (Class/Validity)	One Issued on 11 May 2021 Expiry 11 May 2022

1.6 Aircraft Information

1.6.1 General information

The PIPISTREL 912 Virus 912UL aircraft is a high-wing ultralight motor glider made entirely from composite materials. It has a wingspan of 14.97m and it is 6.6m long and 1.7m high. It has a wing surface area of 12.26m². The undercarriage is a non-retractable tricycle system, with a two-blade variable pitch propeller. The aircraft accident Serial number 135C9120304 is equipped with an 80-HP Rotax 912 UL engine.

The wings' camber can be set in four stages (-5°, 0°, +9°, and +20°) by full-length flaperons. Speed and descent rate may be adjusted by airbrakes/spoilers mounted on top of the wings. According to the manufacturer's recommendation, "when the aircraft is not in use, the airbrake handle is recommended to be left hanging freely in an unlocked, unsprung position, to minimize the fatigue of the springs of the mechanism.

The PIPISTREL Aircraft was manufactured in 2004 and it had a maximum authorized weight of 450kg.

The Aircraft technical records obtained from the operator indicated that the most recent scheduled 200hours maintenance was conducted on 16 October 2020. The aircraft held a valid restricted Certificate of Airworthiness and was maintained at Recreational Aviation Association of Kenya (RAAK), an organization recognized by the KCAA under a letter of agreement for the operation of Recreational Aircraft, Inspection, Maintenance and Training.

1.6.2 Parachute rescue system

The aircraft was equipped with Galaxy Rocket System (GRS) parachute rescue system, located behind the cockpit. The system consists of a parachute, components to attach it to the aircraft's fuselage, a deployment rocket, and an activation handle located in the top part of the cockpits aft panel.

Table1-4: Aircraft data at the time of the accident

Aircraft data at the time of the Accident	
Manufacturer:	Textron Aviation Inc.
Model:	Cessna 172 RG
MSN:	172RG0893
Date of manufacture:	2004
Nationality and registration mark:	Kenyan, 5Y-CFG
Restricted Certificate of airworthiness	
Number:	S/No. 3084
Initial Issue date:	4 April 2020
Renewal date	24 November 2020
Valid until:	29 November 2021
Certificate of registration	
Number:	S/No. 2607
Issue date:	19 November 2014
Date of registration	19 November 2014
Total Aircraft hours since new	1416
Maximum take-off Weight	472.5Kg
Maximum Landing Weight	289Kg

1.6.3 Fuel

The fuel used was AVGAS 100/100LL.

1.7 Meteorology

The occurrence took place in the daytime, in good visibility conditions, without any mentionable meteorological phenomena. According to the data obtained from the Meteorological Department, the air temperature near the ground was 35°C. The speed of the wind from the south-southeast was 12 knots. Based on the International Standard Atmosphere, the air temperature at the actual flight altitude of the aircraft was about 28 to 29 °C. The weather conditions did not affect the course of events, therefore weather needs no further analysis.

1.8 Aids to Navigation

The flight was conducted in the daytime under VFR.

1.9 Communications

The aircraft was fitted with two-way VHF radio communication equipment.

1.10 Aerodrome information

Not Applicable

1.11 Flight Recorders

The aircraft was not fitted with flight recorders and it was not a requirement by the KCAA regulations.

1.12 Wreckage and Impact Information

The main wreckage, which included fuselage, engine, and the right-wing came to rest on the rugged terrain. The left-wing had separated from the fuselage and was located adjacent to the main wreckage. The empennage broke but was still attached to the fuselage. The forward portion of the fuselage was largely intact, with the cockpit doors intact. Both the propeller blades broke mid-span and were located within the wreckage radius. The left and right-wing flaperons remained attached to the wing. The rudder and elevators remained attached to the empennage. Flight continuity was confirmed at the rudder and elevators. Discontinuities in the remainder of the flight control system appeared consistent with separations due to the impact sequence

A post-accident examination of the engine was conducted by AAID Investigators did not reveal any anomalies related to the cylinders, crankshaft, or valve train.

1.13 Medical and Pathological Information

No injuries were reported. There was no evidence of any physiological factors or loss of capacity that influenced the pilots' capacity for work.

1.14 Fire

There was no pre or post-impact fire.

1.15 Survival Aspects

The occurrence was survivable. The pilot escaped uninjured. The aircraft was equipped with a harness-type restraint system.

1.16 Tests and Research

Not applicable.

1.17 Organizational and Management Information

The aircraft is privately registered with the Certificate of registration number 2607 issued on 19 November 2014. It is privately operated under address; P.O.BOX 14355 (00800) Nairobi.

1.18 Additional Information

Not Applicable

1.19 Useful or effective Investigation Techniques

Not Applicable

2.0 Conclusion

2.1 Findings, Probable Causes, and/or Contributing Factors

2.1.1 Findings

- The weather conditions at the time of the accident were within the limits for operations under VFR and considered suitable for the pilot to conduct the flight.
- The aircraft had no outstanding defects and was serviceable for the incident flight.
- The aircraft was operating within its weight and center of gravity limits.
- There was no evidence of any physiological factors or loss of capacity that influenced the pilots' capacity for work.
- The flight crew had appropriate license and qualification as well as adequate experience for the given flight task at the time of the occurrence.
- The aircraft had a valid airworthiness certificate. According to its documents, the aircraft was equipped and maintained in compliance with the requirements in effect and with the approved procedures.
- The flight took place in good visibility conditions, during the daytime.
- The pilot did not activate the recovery parachute system.

2.1.2 Probable Cause(s)

The investigation concluded the probable cause of the occurrence was the pilot's lack of situation awareness and decision to land on undesignated landing surface.

3.0 SAFETY RECOMMENDATIONS

There was no safety recommendation issued in this investigation.

Martyn Lunani

CHIEF INVESTIGATOR OF ACCIDENTS

May 2023