

THE REPUBLIC OF KENYA



MINISTRY OF ROADS AND TRANSPORT

STATE DEPARTMENT FOR TRANSPORT

AIRCRAFT ACCIDENT INVESTIGATION DEPARTMENT

PRELIMINARY INVESTIGATION REPORT

**A SERIOUS INCIDENT TO THE AIRCRAFT 5Y- MMG, CESSNA 172 RG
ON 01 NOVEMBER 2021 AT LAMU MANDA AIRSTRIP, LAMU
COUNTY**

PRELIMINARY SERIOUS INCIDENT REPORT SUMMARY

OPERATOR	:	Aerolink Flight Center
AIRCRAFT TYPE	:	Cessna 172 RG
AIRCRAFT MANUFACTURER	:	Textron Aviation Inc.
YEAR OF MANUFACTURE	:	1982
AIRCRAFT REGISTRATION	:	5Y- MMG
AIRCRAFT SERIAL NUMBER	:	172RG0893
DATE OF REGISTRATION	:	2 May 2019
NUMBER AND TYPE OF ENGINE	:	1, Lycoming IO-360-F1A6
DATE OF OCCURRENCE	:	1 November 2021
LAST POINT OF DEPARTURE	:	Wilson Airport, Nairobi (1.3192° S, 36.8176° E)
POINT OF INTENDED LANDING	:	Lamu Manda Airstrip, Lamu County (0° 11' 34.00"N, 37° 28' 21.00"E)
TIME OF OCCURRENCE	:	1435 (1735)
LOCATION OF OCCURRENCE	:	Lamu Manda Airstrip, Lamu County (0° 11' 34.00"N, 37° 28' 21.00"E)
TYPE OF FLIGHT	:	Private
PHASE OF FLIGHT	:	Landing
NUMBER OF PERSONS ON BOARD	:	1 (One)
INJURIES	:	None
NATURE OF DAMAGE	:	Minor
CLASS OF OCCURRENCE	:	Serious incident
PILOT IN COMMAND	:	CPL holder
PIC's FLYING EXPERIENCE	:	1,534.5

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 Cessna 172 RG , passenger aircraft, registration 5Y-MMG was notified to the Aircraft Accident Investigation Department (AAID), State Department for Transport (SDT) of the Ministry of Roads and Transport, 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 3 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
NM	-	Nautical miles
RWY	-	Runway
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 1 November 2021 a Cessna 172RG, operated by Aerolink Flight Center, registration 5Y-MMG, took off from Wilson Airport in Nairobi County at 0428 (0728) on a private flight to Lamu Manda Airstrip, Lamu County and made a gear up landing when landing at Lamu Manda Airstrip, Lamu County at 0646 (0946).

The Aircraft sustained minor damage to its belly and the propeller. The pilot who was the sole occupant escaped with no injuries.

The investigation attributed the probable cause of the serious incident to the failure of the pilot to extend the landing gear in accordance with the checklist. This resulted in gear up landing and minor damage to the lower part of the aircraft and the propeller.

1.0 FACTUAL INFORMATION

1.1 History of the Flight

On 1 November 2021 a Cessna 172RG registration 5Y-MMG operated by Aerolink Flight Center was involved in a serious incident at Lamu Manda Airstrip runway 15 at 0646 (0946). On board was a pilot who took off from Wilson Airport, Nairobi County at 0428 (0728) to Lamu Manda Airstrip, Lamu County for a private flight.

On the pilot's recount of events, approximately 20 minutes to landing he experienced opposing traffic which caused a delay in landing. After the opposing traffic cleared through their flight level, the aircraft approached the runway high causing a steeper descent rate. In preparation for landing the pilot lowered the aircraft's flaps, adjusted the propeller to fine pitch, opened the cowl flaps and flared for landing on runway 15 (RWY 15). Upon flaring, the pilot heard a scraping noise from the back of the plane and assumed that the tail skid had hit the ground from the steep flare. The aircraft slid along the runway centerline and came to a halt 109 meters from the initial touch down point. The engine came to a stop after the propeller struck the ground and the gear up warning horn went off. At this moment, the pilot realized that he did not select the landing gear lever DOWN to extend the landing gear. He then shut off the fuel valve and the main switch. Aircraft rescue and firefighting truck responded immediately to the site and assisted in removing the disabled aircraft from the runway.

The pilot escaped with no injuries and there was no pre or post-impact fire.

The aircraft sustained minor damage to its belly and the propeller.

At the time of the occurrence the weather comprised few to broken low level clouds at height of 2400fts to 2600fts and light winds with good visibility. The recorded weather during that period posed insignificant aviation hazards.



Figure 1: The Aircraft after landing on its belly



Figure 2: Aerial view of the first and the last point of contact



Figure 3: Slash marks caused by the propeller blades striking the runway surface

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	0	

1.3 Damage to Aircraft

The aircraft sustained minor grinding damage to the belly, both propeller blades exhibited impact damage and the blade tips were bent rearwards. There was a minor dent to the spinner. The outer skin on the bottom of the fuselage was damaged.

Post occurrence visual examination of the aircraft revealed no deficiencies prior to the incident.



Figure 4: Damage to the propeller



Figure 5: The damage to the belly of the aircraft

1.4 Other Damage

Not applicable.

1.5 Personnel Information

1.5.1 Pilot

At the time of the incident, the 37 year old male pilot held a CPL (Aeroplane) first issued on 18 May 2010. The current renewal was issued on 19 May 2021 and valid until 21 May 2022. The current renewal of Flight Radio Telephony Operator's License was issued on 2 November 2020 and valid until 2 November 2021. His most recent medical examination was conducted on 11 May 2021 and issued a class one certificate with a validity of 12 months with no limitations/restrictions in accordance with the current Kenya Civil Aviation Authority (KCAA) personnel licensing requirements.

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

D.o.B/Age	11 October 1984 (37 Years)
Sex	Male
Nationality	Kenyan
Type of License	CPL
Issuing Authority	KCAA
Date of issue	18 May 2010
Last Issue	25 July 2019
Validity of License	21 May 2022
Total Flying hours	1534.5
Total hours on type	1300
Ratings	Cessna 172RG
Total last 90 days (hours)	33.1
Total last 60 days (hours)	20.4
Total last 7 days (hours)	15.4
Total last 24 Hours (hours)	1.4
Medical Certificate (Class/Validity)	One Issued on 11 May 2021 Expiry 11 May 2022

1.6 Aircraft Information

1.6.1 General information

The aircraft, a Cessna 172 RG, serial number 172RG0893, was manufactured in 1982 by Textron Aviation Inc, and entered the Kenyan register on 2 May 2019. It is a four-seat, single-engine, high fixed-wing aircraft powered by a derated Lycoming IO-360-F1A6 producing a maximum of 160 horsepower (120 kW) at 2,400 rpm. It is fitted with a fuel-injected engine and has a maximum takeoff weight of 2,450 lb. (1,111 kg).

The Aircraft technical records obtained from the operator indicated that the most recent scheduled maintenance check 1 was conducted on the 31 October 2021. The aircraft was maintained at Sky Cruise Air services Ltd, an Approved Maintenance Organization.

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:	1982
Nationality and registration mark:	Kenyan, 5Y-MMG
Certificate of airworthiness	
Number:	S/No. 0810
Initial Issue date:	11 September 2019
Renewal date	24 September 2021
Valid until:	23 September 2022
Certificate of registration	
Number:	S/No. 1024
Issue date:	2 May 2019
Date of registration	2 May 2019
Total Aircraft hours since new	3745
Maximum take-off Weight	2045
Maximum Landing Weight	2045
Maximum Operating Altitude	13500 ft.

1.6.2 Fuel

The fuel used was AVGAS 100/100LL.

1.7 Meteorology

The prevailing weather conditions between 0900 (1200) and 1030 (1330) comprised of few to broken low level clouds at height of 2400fts to 2600fts and light winds with good visibility. The recorded weather during that period posed insignificant aviation hazards.

1.8 Aids to Navigation

The flight was conducted in the daytime under VFR.

1.9 Communications

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

1.10 Aerodrome information

Lamu Manda Airport (HKLU) is located on Manda Island in Lamu County along the western shore of the Indian Ocean, on the Kenyan coast. The geographic coordinates of this airport are: 2° 14' 46.00"S, 40° 54' 36.00"E.

The airport serves Lamu Archipelago and is situated at 6 meters (20 ft.) above sea level. The airport has two runways, the first runway (15/33) is paved with asphalt and measures 6,330 feet (1,930 m) in length and 100 feet (30 m) in width. The second runway (08/26) is unpaved and is 3,054 feet (931 m) long and 46 feet (14 m) wide. At the time of the incident runway, (15/33) was in use. (See Figure 2).

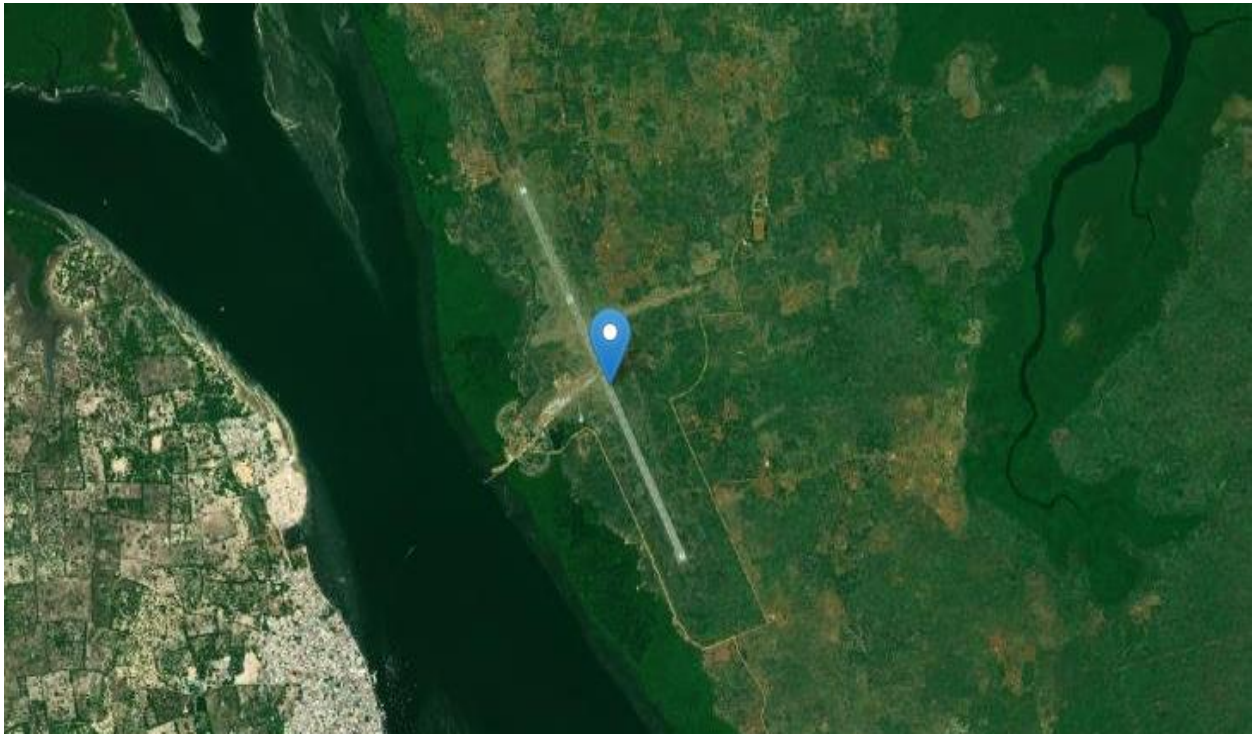


Figure 6: Aerial View of the Aerodrome

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 aircraft came into contact with the runway surface as shown in in Fig. 7. Slash marks caused by the propeller blades striking the runway surface are visible. The touchdown was about 240 m from the threshold of RWY 15. The distance between the first point of touchdown to the final stop was 109 meters. On touchdown, the outer skin on the bottom of the fuselage was damaged. A small piece of debris was found on the runway.



Figure 6: Damage to the outer skin on the bottom of the fuselage

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 1024 issued on 2 May 2019. It is operated by Aero-Link Flight Centre, a KCAA Approved Training Centre (ATO). The ATO operates 4 aircraft; a Cessna 172RG, a piper Aztec PA23-250 and two Piper Cherokee PA28-140.

1.18 Additional Information

Not Applicable

1.19 Useful or effective Investigation Techniques

Not Applicable

2.0 Analysis

- The weather conditions at the time of incident were within the limits for operations under VFR and considered suitable for the pilot Student to conduct the flight.
- The pilot was entitled to act as pilot-in-command of the flight with his valid CPL.
- The aircraft had a valid Certificate of Airworthiness at the time of the incident, and no anomalies were found in the maintenance history.
- The aircraft had no outstanding defects and was serviceable for the incident flight.
- From examining the aircraft damage and ground marks, it was determined that the aircraft had a gear up landing, resulting in the damage of the propeller and the outer skin on the bottom of the fuselage.
- The pilot did not select the landing gear lever to “down” position and hence the failure of the landing gear to extend.
- The touchdown was at 240 m from the threshold of RWY 15.
- The distance between the first point of touchdown to the final stop of the aircraft was 109 meters.
- The propeller, the spinner and the outer skin on the bottom of the fuselage were damaged.
- Landing procedures were not followed in accordance with the checklist for landing operation.
- The landing gear warning horn went off as expected.

- The pilot reported to have heard a scrapping sound coming from the belly of the aircraft. This is when the underbelly of the aircraft came into contact with the runway surface on landing.
- The pilot stated feeling mentally trapped due to cockpit workload. 20 minutes to landing, the pilot experienced opposing traffic which caused a delay in landing.
- There was no evidence of any physiological factors or loss of capacity that influenced the pilots' capacity for work.
- There was no fire.

3.0 Conclusion

3.1 Findings, Probable Causes, and/or Contributing Factors

3.1.1 Findings

- The weather conditions at the time of accident were within the limits for operations under VFR and considered suitable for the pilot to conduct the flight.
- The aircraft had a valid Certificate of Airworthiness and was maintained and certified in accordance with KCAA requirements.
- 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.
- The pilot held a valid KCAA Class 1 Medical Certificate which entitled him to act as the pilot-in-command of the incident flight.
- The landing procedures, where the landing gear should be selected “down” was not performed.
- The gear up touch-down led to propeller strike and damage to the outer skin on the bottom of the fuselage.
- The aircraft final stop was on the runway and there was no fire.
- There was no evidence of any physiological factors or loss of capacity that influenced the pilots' capacity for work.

3.1.2 Probable Cause(s)

The probable cause of the occurrence was the pilot's failure to adhere to pre-landing checklist procedures leading to gear up landing resulting in propeller strike and damage to the outer skin on the bottom of the fuselage.

3.1.3 Contributing factor

- Performance of the tasks by memory, increasing the chances of forgetting to lower the landing gear.
- Distraction. 20 minutes to landing, the pilot experienced opposing traffic which caused a delay in landing.

4.0 SAFETY RECOMMENDATIONS

There was no safety recommendation issued in this investigation.

Martyn Lunani

CHIEF INVESTIGATOR OF ACCIDENTS

May 2023