MINISTRY OF ROADS AND TRANSPORT

STATE DEPARTMENT FOR TRANSPORT

AIRCRAFT ACCIDENT INVESTIGATION DEPARTMENT

INVESTIGATION REPORT 07/12/2024

PRELIMINARY INVESTIGATION REPORT OF A BELLY LANDING INCIDENT INVOLVING BEECHCRAFT BARON 58 AIRCRAFT REGISTRATION 5Y-LOL, ON 07 DECEMBER 2024 AT WILSON AIRPORT, NAIROBI COUNTY

AIRCRAFT ACCIDENT INVESTIGATION

OPERATOR	:	West Rift Aviation Limited
AIRCRAFT TYPE	:	Beechcraft Baron 58
MANUFACTURER	:	Beech Aircraft Corporation.
YEAR OF MANUFACTURE	:	1972
AIRCRAFT REGISTRATION	:	5Y-LOL
AIRCRAFT SERIAL NUMBER	:	TH-234
DATE OF REGISTRATION	:	22 September 2021
NUMBER AND TYPE OF ENGINE	:	2 Continental
DATE OF OCCURRENCE	:	08 November 2024
LAST POINT OF DEPARTURE	:	Wilson Airport, Nairobi County
POINT OF INTENDED LANDING	:	Wilson Airport, Nairobi County
TIME OF OCCURRENCE	:	1252 (1552)
LOCATION OF OCCURRENCE	:	Wilson Airport, Nairobi County (1° 19’ 12.00” S, 36° 48’ 54.00” E)
TYPE OF FLIGHT	:	Training
NUMBER OF PERSONS ON BOARD	:	02
INJURIES	:	None
NATURE OF DAMAGE	:	Minor
CLASS OF OCCURRENCE	:	Serious Incident
PILOT IN COMMAND	:	SPL holder
PIC FLYING EXPERIENCE	:	267.4 hours

All times given in this report are Coordinated Universal time (UTC), with East African local time in parenthesis.

OBJECTIVE

This report contains information which 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 belly-landing incident.

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 investigation of the belly-landing incident.

INVESTIGATION PROCESS

The occurrence involved a Beechcraft Baron 58 aircraft registration 5Y-LOL and was notified to the Aircraft Accident Investigation Department (AAID), State Department for Transport (SDT), Ministry of Roads and Transport through a phone call by the Wilson Air Traffic Controller.

AAID investigators were deployed to the site for initial onsite investigation and witness interviews.

After the initial on-site investigation phase, the occurrence was classified as a “serious incident” in accordance with the International Civil Aviation Organization’s (ICAO) Annex 13 provisions.

TABLE OF CONTENTS

OBJECTIVE 6
INVESTIGATION PROCESS 7
LIST OF ABBREVIATIONS/GLOSSARY OF TERMS 11
SYNOPSIS 12
1. FACTUAL INFORMATION 13
1.1. History of Flight 13
1.2. Injuries to persons 14
1.3. Damage to Aircraft 14
1.4. Other damage 17
1.5. Personnel Information 18
1.5.1 The Pilot 18
1.6. Aircraft Information 19
1.6.2 Maintenance records 21
1.6.3 Mass and Balance 22
1.7. Meteorological Information 23
1.8. Aids to Navigation 24
1.9. Communications 25
1.10. Aerodrome Information 26
1.11. Flight Recorders 26
1.12. Wreckage and Impact Information 26
1.13. Medical and Pathological Information 26
1.14. Fire 26
1.16. Tests and Research 20
1.17. Organizational and Management Information 20
1.18. Additional Information 21
1.19. Useful and Effective Investigative Techniques 21
2. SUMMARY… 21

LIST OF FIGURES

No table of figures entries found.

LIST OF TABLES

Table 1-1. Injury chart 14

Table 1-2. Summary of the Instructor Pilot's Information 118

Table 1-3. Summary of the Student Pilot Information… 18

Table 1-4. Summary of the Aircraft Information 18

LIST OF ABBREVIATIONS/GLOSSARY OF TERMS

AAID	-	Aircraft Accident Investigation Department
AGL	-	Above the Ground Level
AMSL	-	Above Mean Sea Level
AMO	-	Approved Maintenance Organization
ARFFS	-	Aerodrome Rescue and firefighting services
ATC	-	Air Traffic Control
ATO	-	Approved Training Organization
ATPL	-	Airline Transport Pilot License
ELT	-	Emergency Locator Beacon
ft	-	feet
FL	-	Flight Level
HSI	-	Horizontal Situational Indicator
ICAO	-	International Civil Aviation Organization
KCAA	-	Kenya Civil Aviation Authority
METAR	-	Meteorological Terminal Aviation Routine Weather Report
NM	-	Nautical miles
PPL	-	Private Pilots' License
RWY	-	Runway
SPL	-	Student Pilot License
TSN	-	Time Since New
TWR	-	Tower
VMC	-	Visual Meteorological Conditions

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.

SYNOPSIS

On 07 December 2024 at about 1032 (1332), a serious incident occurred at Wilson Airport in Nairobi County involving a twin-engine Beechcraft Baron 58 aircraft registration 5Y-LOL operated by West Rift Aviation Limited. The flight originated from Wilson Airport in Nairobi County at 1252 (1552) on a training flight with an instructor pilot and a student onboard. The aircraft experienced an electrical problem on the short finals in visual meteorological conditions. The electrical problems rendered the communications, navigation, and most of the electrical instruments inoperable. The pilot continued toward the destination airport consequently belly landing the aircraft on runway 07.

The two occupants exited the aircraft without injuries and the aircraft sustained damage. There was no pre- or post-impact fire.

At the time of the serious occurrence, Visual Meteorological Conditions (VMC) prevailed with varying winds.

The investigation into identifying the probable cause(s) of the serious incident is ongoing.

1. FACTUAL INFORMATION

1.1. History of Flight

On 07 November 2024 at about 1252 (1552), a twin-engine Beechcraft Baron 58 aircraft registration 5Y-LOL performing a Visual Flight Rule (VFR) flight gear up landing at Wilson Airport on RWY 07, Nairobi County. On board was an Instructor Pilot and a student pilot on a training flight in the local area.

The reports obtained from the crew indicated that on arrival at Wilson Airport, a pre-flight inspection, and no anomalies were found. The reports indicated that the initial training phases of the flight were uneventful, and engine performance indications showed no abnormalities. During the configuration for landing, the crew experienced intermittent radio interference while in contact with the ATC. The crew continued and at the monastery, they selected gear down and reported to have felt the gear in transit with the green light momentarily illuminating. However, no sound was heard from the landing gear motor and no decrease in aircraft performance was felt that would indicate the gear had extended fully. This was followed by an electrical power failure message on the HIS. They continued in an attempt to address the situation before experiencing total electrical power loss during the short finals. They elected to overfly the airport while rocking the wings, then joined the circuit and performed a gear-up landing on runway 07.

The aircraft slid along the runway centerline and came to a halt 400 meters from the initial touch-down point. Both the engines came to a stop after their propellers struck the ground. The crew 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 instructor pilot and the student pilot escaped with no injuries and there was no pre or post-impact fire. The aircraft sustained substantial damage to its belly and the propellers.

At the time of the occurrence, the weather comprised a few broken low-level clouds at a height of 2400fts to 2600fts and light winds with good visibility. The recorded weather during that period posed insignificant aviation hazards.
Visual Meteorological Conditions (VMC) prevailed with varying winds.

Fig. 1- Aerial view of the crash site and Wilson airport (source: Google earth, with AAID annotations).

1.2. Injuries to persons

Table 1-1. Injury chart

Injuries	Crew	Passengers	Others
Fatal	0	0	0
Serious	0	0	0
Minor	0	0	
None	2	0	

1.3. Damage to Aircraft

The aircraft sustained major grinding damage to the belly, both propeller blades exhibited impact damage and the blade tips were bent rearwards. There was a minor dent in 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.

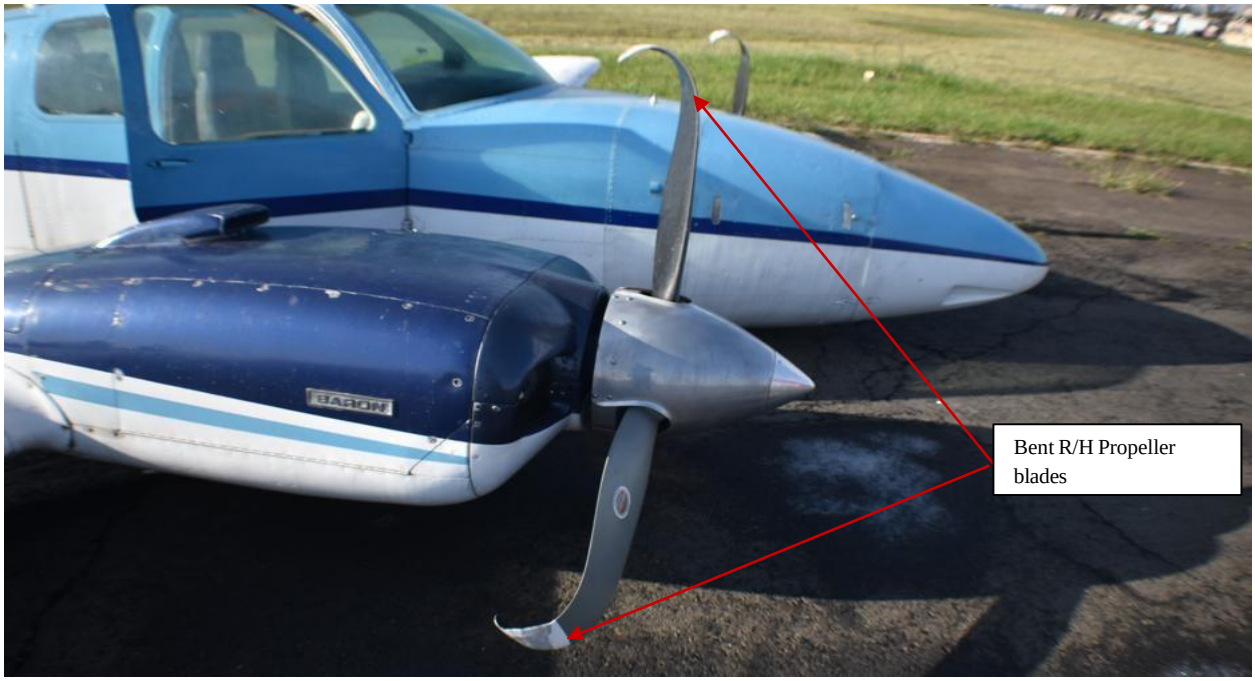

Fig2- The aircraft photo showing damaged R/H propellers

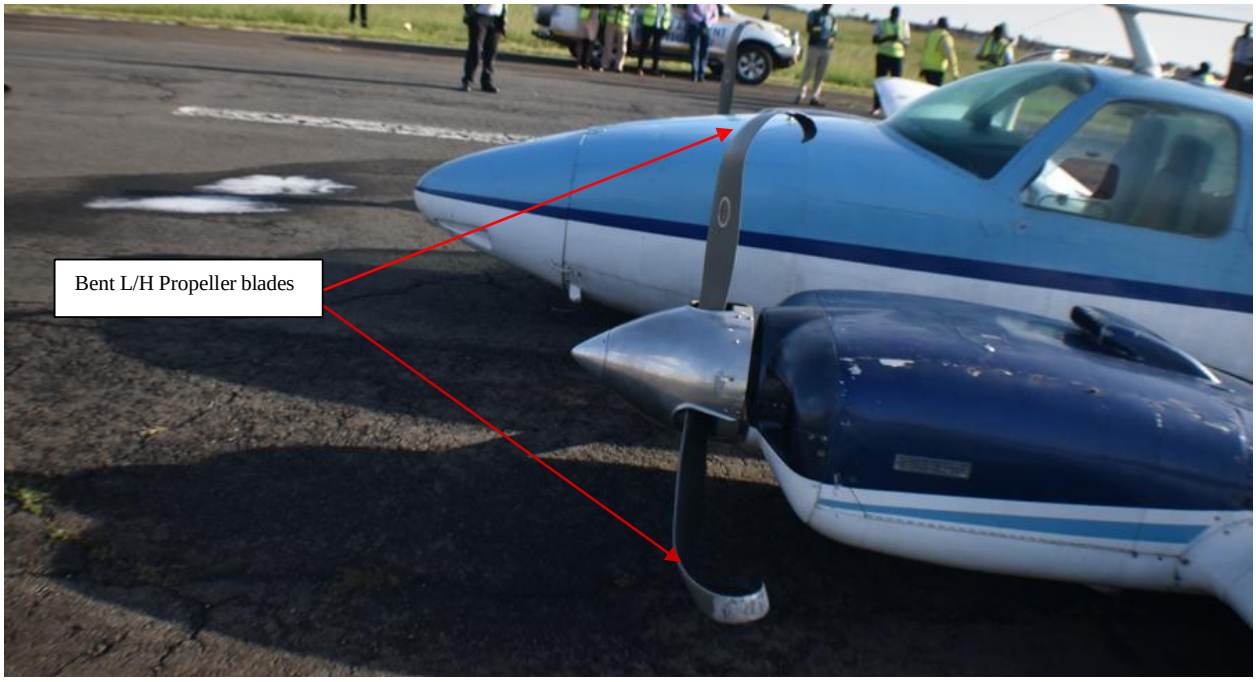

Figure 3- The aircraft photo showing damaged L/H propellers

Figure 4- The aircraft 5Y-LOL on its belly on RWY 07

Figure 5- The AFT section of the aircraft 5Y-LOL on RWY 07

Figure 6- The Aircraft 5Y-LOL belly section after the recovery

Figure 7- Slash marks caused by the propeller blades striking the runway surface

1.4. Other damage

Not applicable

1.5. Personnel Information

1.5.1 The Instructor Pilot

At the time of the serious incident, the 51-year-old male instructor pilot held a ATPL (Aeroplanes) first issued on 15 September 2000. The current renewal was issued on 18 September 2024 and is valid until 17 September 2025. The instructor rating contained in the license is valid until 2 June 2025 with the current renewal of Flight Radio Telephony Operator's License issued on 19 September 2024 and valid until 25 September 2026. His most recent medical examination was conducted on 18 September 2024 and issued a class one certificate with a validity of 12 months with no limitations/restrictions under the current Kenya Civil Aviation Authority (KCAA) personnel licensing requirements.

Table 1-2. Summary of the Instructor Pilot's relevant information

D.o.B/Age	22 April 1973 (51 Years)
Sex	Male
Nationality	Kenyan
Type of License	ATPL
Issuing Authority	KCAA
Date of issue	15 September 2000
Last Issue	18 September 2024
Validity of License	25 March 2025
Total Flying hours	23,167
Total hours on type	TBN
Ratings	TBN
Total last 90 days (hours)	TBN
Total last 60 days (hours)	TBN
Total last 7 days (hours)	TBN
Total last 24 Hours (hours)	TBN
Medical Certificate (Class/Validity)	One Issued on 18 September 2024 Expiry 17 September 2025

1.5.2 The Student Pilot

The 24-year-old pilot held a Student Pilot License (SPL) issued on 23 August 2024 and a Class 1 Medical Certificate without limitations/restrictions, last issued on 23 August 2024 and, valid on 22 August 2026 under the current Kenya Civil Aviation Authority (KCAA) personnel licensing requirements. Documents obtained from the flight school indicated that the student pilot applied for admission on 10 November 2024 and was admitted on 11 November 2024.

D.o.B/Age	17 November 2000 (24 Years)
Sex	Male
Nationality	Kenyan
Type of License	SPL
Issuing Authority	KCAA
Date of issue	23 August 2024
Last Issue	23 August 2024
Validity of License	22 August 2026
Total Flying hours	267.4
Total hours on type	N/A
Ratings	N/A
Total last 90 days (hours)	TBN
Total last 60 days (hours)	TBN
Total last 7 days (hours)	TBN
Total last 24 Hours (hours)	TBN
Medical Certificate (Class/Validity)	One Issued on 23 August 2024 Expiry 22 August 2026

1.6. Aircraft Information

The occurrence aircraft was a twin-engine Beechcraft Baron 58 aircraft, serial number TH-234 is a low-wing, twin-engine aircraft manufactured in the United States in 1996 and first registered in Kenya on 19 March 2021. The aircraft was fitted with 2 Continental IO-520-CB8B piston engines, driving three-blade constant-speed McCauley 3AF32C512 propellers and D-5310 spinner assemblies. Access to the

aircraft is through one of 2 doors, a crew door located on the front right of the aircraft next to the co-pilot's seat, providing access to the front seats. Two rear or 'barn doors' on the right side of the aircraft provide access to the rear cabin for the boarding of passengers and loading of cargo. The aircraft is also fitted with an emergency exit window on the left side of the aircraft next to the left rearward-facing passenger seat. This window can be opened by a passenger in the event of an emergency.

Table 1-3. Summary of the Aircraft information

Manufacturer	Beechcraft Corporation.
Type and model	Twin-Engine Beechcraft Baron 58
Aircraft Year of Manufacture	1972
Aircraft Serial number	TH-234
Nationality / Registration Mark	Kenyan, 5Y-LOL
Name of Operator	West Rift Aviation Limited
Certificate of Registration	19 March 2021
Certificate of Airworthiness	No.0285
Date of Issue	23 April 2024
Validity	22 April 2025
Category of Airworthiness	Commercial Air Transport (Passengers)
Hours, Total airframe time	5008.5 hours
Number and Type Engine type	Two, Continental IO-520-CB8B
Engine Serial No.	LH-1009081 and RH-1009078
Engine Year of Manufacture	TBN
Fuel type used	AVGAS
Gross Weight	5,400lbs

1.6.1. Specific Information – 5Y-LOL

Figure 8- Photo of the aircraft 5Y-LOL parked at Wilson Airport after the occurrence

1.6.2 Aircraft Electrical system

Aircraft power was supplied by a single battery and an alternator fitted to each of the aircraft's 2 engines. These power sources could be connected and disconnected individually using 3 separate switches on the pilot's sub-panel labelled 'MASTER'. To protect the avionics from electrical damage when the master switches are being operated, a separate 'AVIONICS MASTER' switch-controlled power to these devices. The 'AVIONICS MASTER' is dependent on the 'MASTER' switches in the control hierarchy, meaning that if the 'MASTER' switches are off, the 'AVIONICS MASTER' cannot be able to be powered.

1.6.3 Landing Gear Warning and Indication System

The landing gear is operated through adjustable linkage connected to an actuator through an actuator assembly mounted beneath the front seats. The actuator assembly is driven by an electric motor. The landing gear may be electrically retracted and extended, and may be extended manually.

The landing gear warning system warns the pilot if the aircraft is incorrectly configured for landing due to the gear not being extended. The system consists of a warning horn connected to flap, throttle, and landing gear position switches. The horn will activate if the flaps are extended to full and the throttles are retarded while the landing gear is selected up.

The landing gear indication system consists of 4 lights, including one for each of the left, right and nose gears indicating they are in the down and locked position. A fourth light indicates that the gear is in transit. The lights are positioned above the gear switch handle on the instrument panel on the pilot's subpanel assembly.

The lights are connected to down-lock and up-lock switches on each of the gear. The in-transit light is illuminated when either the down-lock or up-lock switches on any of the gear are not depressed. Once the down lock switches on each gear is closed, the light for that gear is switched on and once all 3 down lock switches are activated, the in-transit light switches off. These lights are connected to a 5-amp power supply and are switched on by grounding the circuit through these switches.

The wiring for these systems, and several other electrical systems, are bundled together in an avionics bay. The AAID's preliminary review of the aircraft electrical wiring schematics has not been able to identify a single point of failure, either through a short between systems or to ground or an open circuit, which could have caused the symptoms that the pilot reported.

1.6.4 Maintenance Records

At the time of the serious incident, the aircraft had a valid Certificate of Airworthiness in the Commercial Air Transport (Passengers) Category issued by KCAA and valid for the period between 22 April 2024 and 23 April 2025. A review of the aircraft records indicated that the aircraft had no outstanding defects before the occurrence flight. The aircraft was certified, equipped, and maintained under existing KCAA regulations and approved procedures. The most recent scheduled 50-hour maintenance check was conducted on 12 November 2024. The 50-hour inspection check was performed by Westland Aviation Services Limited. The Approved Maintenance Organization (AMO) was granted an approval certificate on 29 August 2024 valid up to 28 August 2025. At the time of the occurrence, the aircraft had flown approximately 5008.5 hours since new.

1.6.3 Mass and Balance

Not applicable.

1.7. Meteorological Information

Meteorological Information obtained from the Meteorological Department of Kenya indicated that there was no significant weather reported near the Wilson Airport and its environs were suitable for a VFR flight.

1.8. Aids to Navigation

Not applicable. The occurrence flight was operated under VFR, during which the aircraft was required to remain clear of clouds and in sight of the surface.

1.9. Communications

The aircraft was equipped with a two-way Very High Frequency ("VHF") radio. Communication was not considered a factor in this occurrence.

1.10. Aerodrome Information

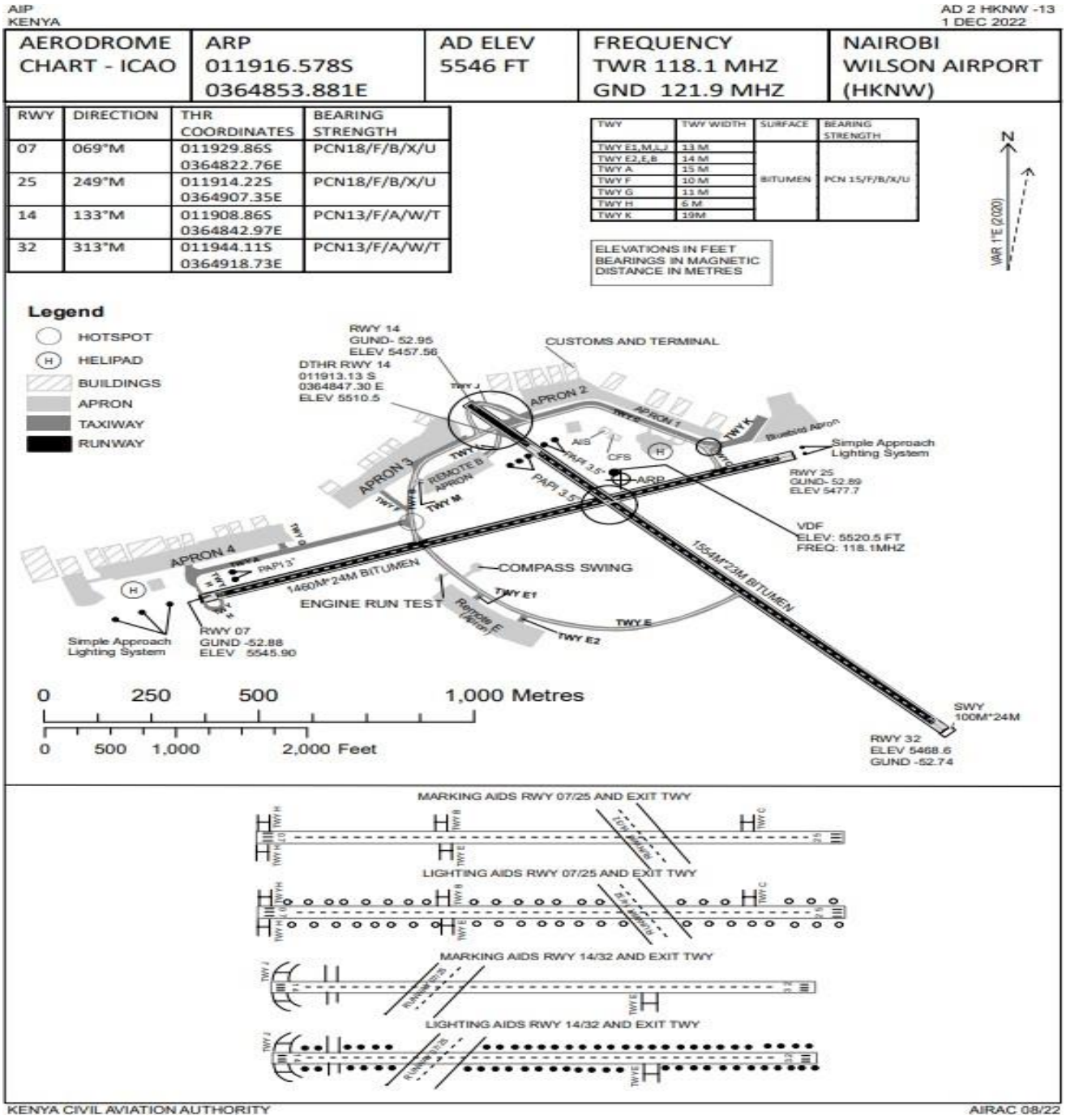

FIGURE No. 8 – HKNW AERODROME CHART (Source: KCAA with AAID annotations)

Wilson Airport is located at latitude 01° 19' 18.19" S and longitude 036° 48' 53.40" E at an elevation of 5,546 feet (ft) above mean sea level (AMSL). It is a medium-sized airport situated about 5km south of

Nairobi Central Business District. It serves both domestic and international traffic and has two runways with bituminous surface:

- RWY 07/25 measures 4,790 ft (1,460m) long by 78.74 ft (24m) wide;
- RWY 14/32 measures 5,098.42 ft (1,554m) long by 75.45 ft (23m) wide.

The Airport has the following bituminous surface taxiways; A, B, C, E, E1, E2, F, G, H, J, K, L, and M. It is also used by ATOs for training flights. The aerodrome is operated by the Kenya Airports Authority (KAA). It has a KCAA-manned Air Traffic Control (ATC) and permits IFR/VFR types of traffic.
The rescue and firefighting services category is CAT 5 and rescue equipment is available.

HKNW Air Traffic Services (ATS) airspace designation and lateral limits are:

> **Area I:** Area bounded by lines joining points 011554.17S, 0365204.56E; 010823.60S, 0370258.50E then along the counterclockwise arc of a circle of 15NM radius centered on 011909.40S, 0365229.10E to 012243.80S, 0363757.30E; 011916.58S, 0364853.88E to point of origin.
>
> **Area II:** Area bounded by lines joining points 011916.58S, 0364853.88E; 012243.80S, 0363757.30E then along the counterclockwise arc of a circle of 15NM radius centered on 011909.40S, 0365229.10E to 013213.10S, 0364503.70E to point of origin.

The vertical limits are ground (GND) to 9,000 ft AMSL while the transition altitude is 9,000 ft AMSL. HKNW Airspace is in the D classification. For above 9,000 ft MSL, this portion becomes part of Area II under the control of Nairobi/HKJK. Above 6,500ft, Area II becomes part of Area III.

1.11. Flight Recorders

Not applicable. Flight recorders are not required by KCAA regulations for this category of aircraft.

1.12. Wreckage and Impact Information

The aircraft came into contact with the runway surface. Slash marks caused by the propeller blades striking the runway surface are visible. The touchdown was about 40 m from the threshold of RWY 07. The distance between the first point of the touchdown to the final stop was 400 meters. On touchdown, the outer skin on the bottom of the fuselage was damaged. Small pieces of debris were found on the runway. There was also evidence of engine rotation prior to the aircraft coming into contact with the runway as exhibited by the propellers and no evidence found of pre-existing defects in the engines or flight control components that could have contributed to the occurrence. The landing gear was observed in the stowed position and no landing gear impact marks were visible from the point of initial contact up to final stop on the runway.

1.13. Medical and Pathological Information

The pilot was not on prescribed drugs. No tests were conducted to check if his performance was affected by fatigue, alcohol, drugs and/or medication at the time of the occurrence.

1.14. Fire

There was no inflight or post-impact fire.

1.15. Survival Aspects

The serious incident was survivable. The two occupants survived without injuries and exited the aircraft unaided. The seats and harness were all intact and showed no sign of damage.

1.16. Tests and Research

Not applicable.

1.17. Organizational and Management Information

1.17.1 West Rift Aviation Limited

The Operator was the holder of a Kenya Civil Aviation Authority Approved Training Organization certificate serial No.135, Ref KCAA/FOPS/3010 issued on 06 May 2024 and valid until 05 May 2025, issued under Training and Procedure Manual and the Civil Aviation (Approved Training Organization) Regulations 12 of 2018 and as delegated by the authority. The ATO is located at

Building No.17A, Wilson Airport of Postal Address P.OBox 60091-00200, Nairobi-Kenya and conducting training flights in fixed-wing aircraft. It has bases at Orly Airpark, Wilson Airport and Malindi Airport. The school has its own Safety Management System to promote a safety culture and identify areas for improvement.

1.17.2 Westland Aviation Services Limited

According to the records obtained from the KCAA, Westland Aviation Services Limited was the AMO for the ATO with a maintenance facility based at Sumbatini Hangar, Basil in Kajiado County. The organization was issued with AMO certificate No. K/AMO/L/089 having complied in all respects with the requirements of the Kenya Civil Aviation Regulations in force, relating to the establishment of an AMO and empowered to operate an AMO. The certificate was issued on 29 August 2024 valid up to 28 August 2025.

1.18. Additional Information

Not applicable.

1.19. Useful and Effective Investigative Techniques

Not applicable.

2. SUMMARY

The ongoing investigation will analyse, as appropriate, all the information documented, list the findings, cause(s) and/or contributing factors established and state any recommendations made for accident prevention.

Ag. Chief Investigator-AAID

19/12/2024