



5N-CAG

Preliminary Report on the Serious Incident involving Beech Baron 58 aircraft operated by Nigeria College of Aviation Technology (NCAT), Zaria with nationality and registration marks 5N-CAG, which occurred on runway 05 at Kaduna International Airport, Kaduna Nigeria on 31st December, 2022

Registered owner: Nigerian College of Aviation Technology, Zaria
Operator: Nigerian College of Aviation Technology, Zaria
Aircraft type and model: Beech Baron 58
Manufacturer: Hawker Beechcraft LTD, Wichita, Kansas, USA
Year of manufacture: 1995
Serial number: TH-1756
Nationality and registration marks: 5N-CAG
Location: Runway 05 Kaduna International Airport, Kaduna
Date and Time: 31st December, 2022 at about 10:16 h
(All times in this report are local time, equivalent to UTC+1 unless otherwise stated)

INTRODUCTION

Accident Investigation Bureau, Nigeria (AIB-N) was notified of the occurrence by the Nigeria Airspace Management Agency (NAMA) on 31st December, 2022. Investigators were dispatched to the incident site the same day and commenced post occurrence assessments, under the provisions of Civil Aviation (Investigation of Air Accidents and Incidents) Regulations 2019 and ICAO Annex 13.

The purpose of this preliminary report is to provide details of the initial facts gathered so far including discussions and findings surrounding the occurrence, information gathered from the witness accounts and a post occurrence inspection of the aircraft.

The investigation is ongoing.

1.0 FACTUAL INFORMATION

1.1 History of the flight

On 31st December, 2022 at about 10:16 h, a Beech Baron 58 aircraft with nationality and registration marks 5N-CAG, operated by Nigerian College of Aviation Technology (NCAT), Zaria was scheduled for Airline Transport Pilot Licence (ATPL) training on instrument approach procedures in Kaduna International airport. There were four persons onboard including the Flight Instructor (FI), the Student Pilot (SP) and two additional student pilots seated at the rear with fuel endurance of 6 hours. The SP was the Pilot Flying (PF) on the left seat and the FI was the Pilot Monitoring (PM) on the right seat.

The ATPL training was initially scheduled to be conducted in Mallam Aminu International Airport Kano with Diamond 42 (5N-CZA and 5N-BZE) due to the availability of Jet A1 fuel. In the course of the training, DA-42 became unserviceable due to the Service Bulletin (SB) with reference number MSB 42-143/1 and MSB 42NG-086/1 requiring inspection of hole position and condition in the rudder steering bracket. NCAT decided to continue the training in Kaduna International Airport with Beech Baron 58 that uses AVGAS which is readily available in Kaduna.

At 09:20 h, the FI briefed the SP on the training and the SP carried out preflight inspection in accordance with the Baron 58 (B 58) Normal Procedures checklist.

At 09:56 h, 5N-CAG requested for engine start-up for a non-precision VOR/DME instrument approach exercise for Runway 05 from Tower which was granted.

At 10:00 h, 5N-CAG requested for taxi and it was granted. According to the SP, during taxi the throttle levers were stiff and the engine RPM of the engines were not synchronized. Also the SP observed red warning light indicator for the left alternator. The FI confirmed the indication as normal when asked.

The flight crew stated that, at the holding point Before the Take-off checklist was completed and all parameters were found in the green.

At 10:15 h, 5N-CAG requested for take-off which was granted. The flight crew further stated that after line-up for take-off the throttle was advanced, confirmed centre line and then full power, wind was 23 kt. At rotation speed, immediately after lift-off, the cockpit door on the right side opened. The SP continued with the take-off while the FI attempted to close the door. As the FI tried to close the door, the SP reduced the throttle lever to 300 RPM. With the door still open, the crew decided to land the aircraft straight ahead on the remaining runway. The FI took over control of the aircraft, closed the throttle levers and confirmed from the SP if the landing gears were down. The SP replied landing gear down with three greens.

The flight crew also stated that, on landing the left main wheel touched the runway first then the right main wheel. The aircraft veered to the right and FI applied left rudder to keep the aircraft on the runway. The right main landing gear sheared off and the right wing impacted the runway as the aircraft veered to the right of the runway. The aircraft finally came to stop at the edge of runway 05 with the right wing dripping fuel.

The flight crew notified the Tower of the occurrence and requested the assistance of the Emergency services followed by the complete shutdown of the aircraft.

All the occupants disembarked unhurt.

The incident occurred at 10:16 h, day time in Instrument Meteorological Conditions.

1.2 Injuries to persons

Injuries	Crew	Passengers	Others	Total in the aircraft
Fatal	Nil	Nil	Nil	Nil
Serious	Nil	Nil	Nil	Nil
Minor	Nil	Nil	Nil	Nil
None	2	2	Nil	4
Total	2	2	Nil	4

1.3 Damage to aircraft

The aircraft was substantially damaged.

1.4 Other damage

Nil

1.5 Personnel information

1.5.1 Pilot (Flight Instructor)

Nationality:	Nigerian
Age:	54
License type:	Airline Transport Pilot License (Aeroplane)
License:	Valid till 9th May, 2023
Aircraft ratings:	Part 1: Beach Baron-58, Tampico Club TB-9 and Daher-Socata TBM 850
Medical certificate:	Valid till 9th May, 2023
Total flying time:	5000 h
Total on type:	400 h
Total on type (PIC):	370 h
Last 90 days:	50 h
Last 28 days:	0 h
Last 7 days:	0 h
Last 24 hours:	0 h

During post occurrence interview, the FI stated that there were previous instances of the door opening in flight. These incidences were not entered in the technical logbook.

1.5.2 Co-Pilot (Student Pilot)

Nationality:	Nigerian
Age:	31
License type:	Commercial Pilot License (Aeroplane)
License	Valid till 7th March 2023
Aircraft ratings:	Part 2: EMB-135/145 Beach Baron-58, Tampico Club TB-9
Medical certificate:	Valid till 7th March 2023
Total flying time:	1972 h
Total on type:	32:52 h
Total on type (PIC):	344 h
Last 90 days:	170 h
Last 28 days:	40 h
Last 7 days:	0 h
Last 24 hours:	0 h

1.5.3 Engineer

Nationality:	Nigerian
Age:	53
License type:	Aircraft Maintenance Engineers Licence (AMEL)
License validity:	Valid till 13th June, 2027
Aircraft ratings:	Beach Baron-58, SOCATA TB-9 Tampico Club, SOCATA TB20Trinidad, Diamond DA 40, Diamond DA 42

During post occurrence interview, it was discovered that the maintenance engineers were last trained in 2017.

1.6 Aircraft information

1.6.1 General information

Type:	Beech Baron 58
Manufacturer:	Hawker Beechcraft LTD, Wichita, Kansas, USA
Year of manufacture:	1995
Serial number:	TH-1756
Certificate of Airworthiness:	Valid till 25th April, 2023
Certificate of insurance:	Valid till 3rd January, 2023
Certificate of registration:	Issued on 30th April, 2007
Total airframe time:	2014:41 h
Total Landing Cycles:	3209

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Figure 1: 5N-CAG before the occurrence

1.6.2 Engines

Engine	Number 1	Number 2
Manufacturer	Continental Motors, INC	Continental Motors, INC
Type/Model	Continental IO-550-C1F	Continental IO-550-C1F
Serial number	1038268	1037709
Time Since New	315:55 h	315:55 h



1.6.2 Propellers

Propeller	Number 1	Number 2
Manufacturer	McCauley	McCauley
Type/Model	3AF32C512-C	3AF32C512-C
Serial number	181086	951223
Time Since New	315:55 h	315:55 h
Number of blades	3	3

Fuel Used: AVGAS

1.7 Meteorological information

DNKA 0800z

Wind: 070°/19 kt

Visibility: 2000 m

Weather: Haze

Cloud: NSC

Temp/Dew: 18/-01 °C

QNH: 1020

DNKA 0800z

Wind: 050°/15 kt

Visibility: 2000 m

Weather: Haze

Cloud: NSC

Temp/Dew: 20/-01 °C

QNH: 1021

1.8 Aids to navigation

The status of the navigational aids at Kaduna airport on the day of the occurrence were as follows:

VHF 118.8 MHz Tower Main Frequency	-	'Serviceable'
VHF 118.5 MHz/121.7 MHz/122.3 MHz/124.3MHz	-	'Serviceable'
"KDA" VOR/DME 115.3 MHz	-	'Serviceable'
Met Information System/L.L.W.A.S	-	'Serviceable'

The status of the landing aids at Kaduna airport on the day of the occurrence were as follows:

MOSE/INTERCOM PHONE/ITEL/HUAWEI/HUAWEI NEW	-	'Serviceable'
DIGITAL ANNEMOMETER/INFRA RED THERMOMETER	-	'Serviceable'
WIND DIRECTION/SPEED INDICATORS	-	'Serviceable'
ALDIS LAMP/ATC CLOCK/BINOCULARS	-	'Serviceable'

1.9 Communication

There was effective communication between the aircraft and air traffic control up to the point of take-off. After the landing, 5N-CAG requested for fire truck. The ATC enquired for the nature of the emergency which there was no response from the crew. The ATC called again for the nature of the emergency, the crew responded that the right main landing gear was damaged.

The Tower audio recording system was unserviceable at the time of the occurrence.

1.10 Aerodrome information

Kaduna airport (DNKA) is located 29 km North-West of Kaduna with coordinates 10°41'39.4"N 7°19'06.0"E and has an elevation of 632 m. The aerodrome has a runway of an asphalt/concrete surface with orientation of 05/23. The length and width of the runway are 3000 m and 60 m respectively.

The control tower in Kaduna airport is temporarily located at the ARFFS watch room at the time of occurrence. The watch room provides limited viewing of the extreme end of runway 05.

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ARFFS Watch room/ATC Tower



ATC tower under construction

1.11 Flight recorders

The aircraft was not equipped with a Flight Data Recorder (FDR) or Cockpit Voice Recorder (CVR). Neither of these was required by the regulations.

1.12 Wreckage and impact information

During take-off and after lift-up the cockpit door opened on the right side. The SP reduced engine power then FI closed the throttle levers and landed the aircraft. The right main landing gear sheared off.

The damages sustained by the aircraft include;

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1. The right main landing gear torque link sheared-off
2. The right main landing gear inner cylinder separated from the outer cylinder
3. The right wing lower section of the tank tore-off
4. Two of the propeller blades of the right engine bend outward and the other bend rearward
5. The aircraft step broke-off



Figure 2: The aircraft after the occurrence

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Figure 3: The aircraft after the occurrence



Figure 4: The sheared right main landing gear

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Figure 5: The remaining part of the landing gear attach to the aircraft



Figure 6: The remaining part of the landing gear attach to the aircraft

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Figure 7: Bent propeller blade at the tip



Figure 8: The broken step



Figure 9: The torn right tank from the bottom



Figure 10: The torn right tank from the bottom



Figure 11: The unclatched starboard door handle

On arrival of the safety investigators to the scene of the occurrence, it was discovered that the aircraft was moved away from its final position to another location 713 m along the runway.

The distance from the threshold of runway 05 to the point, where the right main landing gear sheared off is 847 m.

The distance from the point, where the right main landing gear sheared off to the final position of the aircraft is 203 m.

1.13 Medical and pathological information

The post-incident medical examinations report (including physical, mental, psychology, and full toxicology) was carried out on the crew on the 31st December 2022 at about 14:00 h, at Mends Specialist Hospital and Aviation Medical Centre in Kaduna, Nigeria.

The medical examination indicated that the assessment on both flight crew were within normal findings.

1.14 Fire

There was no pre or post occurrence fire.

1.15 Survival aspect

The incident was survivable. The structural integrity of the cabin was not compromised. The FI and the SP exited the aircraft through the cockpit door while the other two occupants exited the aircraft through the cabin door. The seats and seat belt harness were intact. There was no evacuation. At 10:19 h, Aerodrome Rescue and Fire Fighting Service (ARFFS) arrived at the scene of the occurrence and discovered fuel spillage from right wing tank and hydraulic fluid spill from the detached right main wheel. One charged hose of water was used to flush out the fuel spill and maintained a standby at the scene.

2.0 INITIAL FINDINGS

1. The flight crew were licensed and qualified to conduct the flight.
2. The aircraft had a valid Certificate of Airworthiness.
3. The flight was an Airline Transport Pilot Licence (ATPL) training on instrument approach procedures.
4. The SP was the Pilot Flying (PF) and the FI was the Pilot Monitoring (PM).
5. The ATPL training was initially scheduled to be conducted in Mallam Aminu International Airport Kano with Diamond 42 (5N-CZA and 5N-BZE) due to the availability of Jet A1 fuel.
6. In the course of the training, DA-42 became unserviceable due to the Service Bulletin (SB) with reference number MSB 42-143/1 and MSB 42NG-086/1 requiring inspection of hole position and condition in the rudder steering bracket
7. The College decided to continue the training in Kaduna airport with Beech Baron 58 that uses AVGAS, which is readily available in Kaduna.
8. During taxi the SP reported that the throttle levers were stiff and the engine RPM of the engines were not synchronized.
9. The SP also observed red warning light on the left alternator and informed the FI.
10. At rotation speed, immediately after lift-off, the cockpit door on the right side opened.
11. The SP continued with the take-off while the FI attempted to close the door.
12. The FI tried to close the door, the SP reduced the throttle lever to 300 RPM.
13. With the door still open, the crew decided to land the aircraft straight ahead on the remaining runway



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14. On landing, the left main wheel touched the runway first then the right main wheel.
15. The right main landing gear sheared off.
16. The right wing impacted the runway and the aircraft veered to right of the runway.
17. The aircraft came to stop at the edge of the runway with the right wing dripping fuel.
18. The aircraft was moved to another location before the arrival of the safety investigators.
19. During post occurrence interview, the FI stated that there were previous instances of the door opening in flight.
20. There were no technical logbook entries for the previous incidences of door opening in flight.
21. The tower audio recording system was unserviceable at the time of the occurrence
22. During post occurrence interview it was discovered that the maintenance engineers were last trained in 2017.



3.0 IMMEDIATE SAFETY RECOMMENDATIONS

1. The Nigerian College of Aviation Technology (NCAT), Zaria should not tamper with evidence of an aircraft occurrence which could lead to loss of evidence and adhere strictly to the provisions of Part 3 section 19 (1), (2) (a and b) Civil Aviation (investigation of air accidents and incidents) regulations 2019 .
2. The Nigerian College of Aviation Technology (NCAT), Zaria should ensure that its flight crew made entries in the Technical Logbook of the door opening in flight.
3. The Nigerian College of Aviation Technology (NCAT), Zaria should ensure that type rated engineer's on the college fleet undergo refresher trainings as required by relevant sections of Nig.CARs 2015
4. The Nigerian Airspace Management Agency (NAMA) should ensure that the Tower audio recording system installed at Kaduna airport Tower is serviceable.