

**AIRCRAFT ACCIDENT AND INCIDENT  
INVESTIGATION AND PREVENTION BUREAU  
(AIB GHANA)**



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**REPORT ON ACCIDENT INVOLVING TRAVAUX ET  
SERVICES AERIENNES (TSA), HUMBER AVIATION  
M.D.C. 912 STA AIRCRAFT WITH REGISTRATION  
TU-LAB, AT KASUNYA - ASUTSUARE (EASTERN  
REGION) ON 17 MARCH 2022.**

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**AIRCRAFT ACCIDENT REPORT  
AIB/2022/03/17/ACCID**

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This investigation was conducted by the Aircraft Accident and Incident Investigation and Prevention Bureau (AIB Ghana) in accordance with the International Civil Aviation Organisation (ICAO) Annex 13 and the Ghana Aircraft Accident and Incident Investigation and Prevention Bureau Act, 2020 (Act 1028).

The sole objective of this investigation is to prevent the occurrence of future incidents. It is not the purpose of this investigation to apportion blame or liability. Furthermore, this report should not be used to assign blame, fault or to determine liability.

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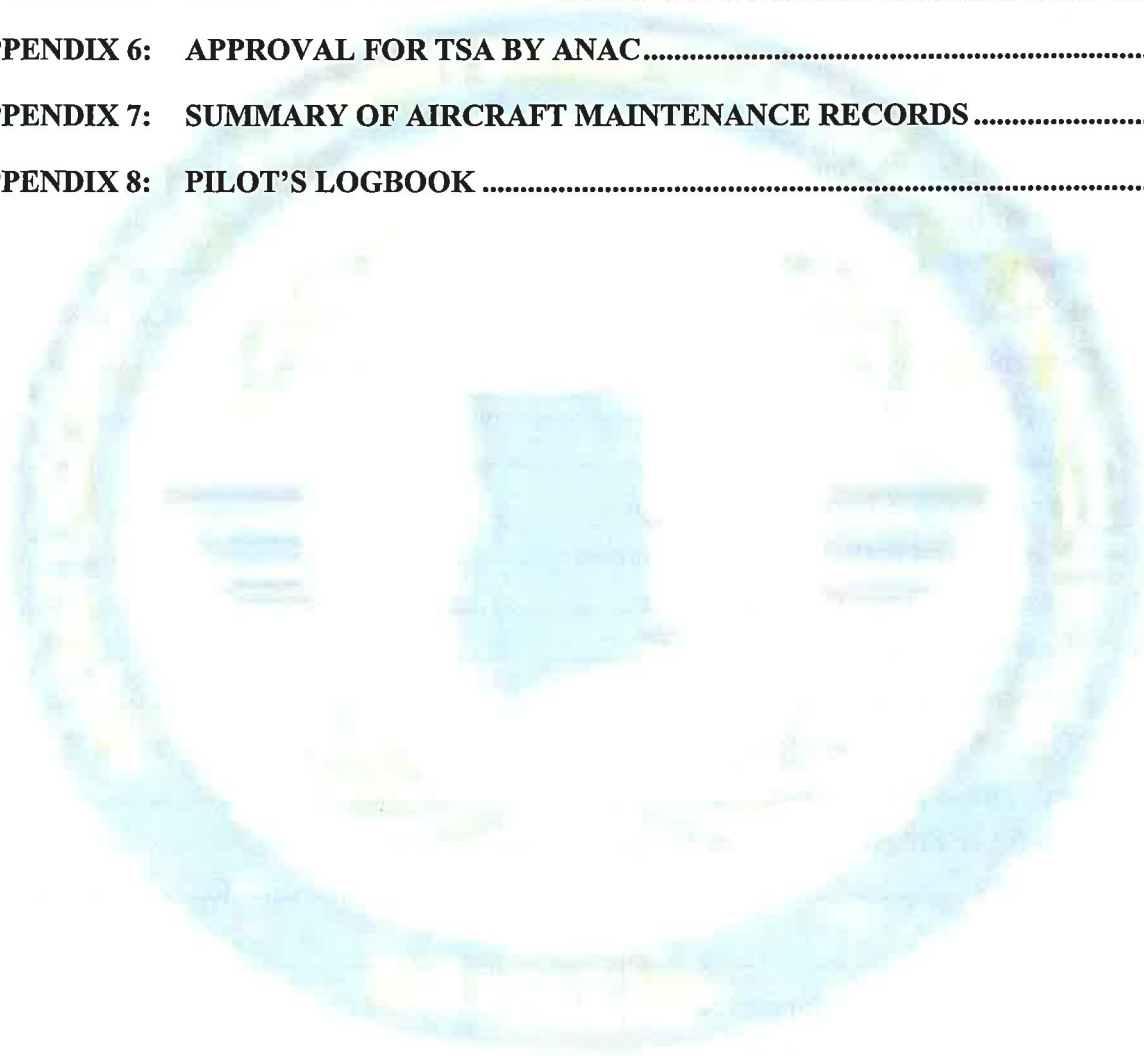
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**GLOSSARY**

AIB	-	Aircraft Accident and Incident Investigation and Prevention Bureau
ANAC	-	Autorite Nacional L'aviacao Civil
AVGAS	-	Aviation Gasoline
GCAA	-	Ghana Civil Aviation Authority
GEL	-	Golden Exotic Limited
GPS	-	Global Positioning System
GS	-	Ground Speed
IAS	-	Indicated Airspeed
kph	-	kilometres per hour
m	-	meters
TSA	-	Travaux Et Services Aeriennes
VMC	-	Visual Meteorological Conditions

## NOTIFICATION

The AIB was notified by the Ghana Civil Aviation Authority (GCAA) on 17 March 2022 of an accident involving a La Cote D' Ivoire registered aircraft, TU-LAB operated by Travaux et Services Aeriennes (TSA). The aircraft, M.D.C. 912 STA (Microlight) was at the time being used for crop spraying for Golden Exotic Limited (GEL), a banana producing company at Kasunya near Asutsuare in the Eastern Region.

A preliminary investigation was conducted by officials from AIB and relevant stakeholders were notified. Subsequently, the Commissioner for AIB commissioned a five-member investigation Investigation Team to investigate the cause of the accident, in accordance with Annex 13 to the Convention on International Civil Aviation and the Ghana Aircraft Accident and Incident Investigation and Prevention Bureau Act, 2020 (Act 1028).

The report is based on the information collected on the circumstances of the accident, which then has been analysed for the investigation. Such information has been used to arrive at the conclusions and safety recommendations made appropriately. The recommendations are aimed at reducing or eliminating the probability of a repetition of the same type of occurrence, and where appropriate, to increase the overall safety of aviation.

**SYNOPSIS**

On 17<sup>th</sup> March 2022, at about 0803hrs TSA's registered aircraft, TU-LAB crashed between field C and D of Sector 22 banana plantation for GEL. The single seater aircraft had departed from Runway 28(C) to continue its routine crop spraying activities for the day.

The aircraft struck a power line that runs across end of the Sector. The aircraft crashed into the adjacent field and then caught fire. The aircraft was destroyed and the Pilot evacuated without any injury.

The factors that contributed to the above accident were identified to be mainly Human Factors. In order to prevent a probability of such occurrence, the Investigation Team has recommended that TSA develops standard procedures to include face-to-face handing over and taking over for Pilots and also intensify Human Factors training for its Pilots and related staff.

## 1.0 FACTUAL INFORMATION

### 1.1 History of Flight

On 17<sup>th</sup> March 2022, at about 0803hrs, TU-LAB departed from Runway (28)C to continue its routine crop spraying. It was the last flight of the day for the Pilot on Sector 22 of the banana plantation.

The Pilot was established in a level flight at an altitude of about 12m and a speed of 120kph. The aircraft was flying West to East over Sector 22 of the banana plantation at the time of the accident.

The Pilot flew approximately 3m above the plantation as per normal procedure which is slightly below the level of electricity power lines at the end of each sector. Just before reaching the end of the sector, he discontinued the spraying in anticipation of the power lines and initiated a pull up to clear the obstacle. However, a strong wind gust pushed the aircraft down and caused the wing to hit the power lines which crosses Sector 22 between fields D and C.

Upon the impact, the aircraft crashed in the North-West corner of the farm field (See Figure 1). The aircraft landed on its back and then caught fire.

The Pilot immediately evacuated from the aircraft to a safe distance while the aircraft simultaneously began to burn. He was conveyed to the farm clinic by the farm manager who had witnessed the crash. The crash site was subsequently cordoned off to prevent any interference with the aircraft and other equipment.



*Figure 1: Satellite view of crash site\_ Sector 22 (D-C)(cyan line-direction of flight/red line-voltage line running along road/yellow mark-crash site)*



**1.2 Injuries**

Injuries	Crew	Passenger	Other
Fatal	Nil	Nil	Nil
Serious	Nil	Nil	Nil
Minor/ None	Nil	Nil	Nil

*Table 1: Summary of Injuries*

**1.3 Damage to Aircraft**

The aircraft was destroyed.

**1.4 Other Damages**

Banana trees within 8ft radius of the wreckage, farm sprinkler system and power lines were also damaged.



*Figure 2: Damaged Power line*

## 1.5 Personnel Information

The Pilot, a male, aged 26, is a holder of an Ultralight Pilot License with License No. VI – ULM 0067 valid until 10<sup>th</sup> November 2022. He holds appropriate certification on the aircraft and has successfully completed 130 Hours on Ultra-Light Type and 959 Hours total flying experience. The Pilot has in the last 90 days flown 130 hours on the aircraft.

## 1.6 Aircraft Information

### 1.6.1 Aircraft

Type:	MDC 912 STA
Serial No.:	13007
Manufacturer:	Humbert Aviation
Date of Manufacture:	2007
Registration Markings:	TU-LAB
Aircraft Time Since New:	3542.2 Hours
Aircraft Cycles Since New:	9372 Cycles

### 1.6.2 Engine

Type:	1 x Rotax 912 ULSFR
Manufacturer:	Rotax Engines
Engine Serial Number:	6783366
Engine Time Since New:	1860.2 Hours
Fuel:	AVGAS

## 1.7 Meteorological Information

The flights were conducted under Visual Meteorological Conditions. There was sunlight at the time of the accident.

**1.8 Aids to Navigation**

Not Applicable.

**1.9 Communication**

Not Applicable.

**1.10 Aerodrome Information**

The Kasunya airstrip (6° 3' 0" North, 0° 16' 0" East), is an uncontrolled airport situated in Yilo-Krobo-Osudoku, Eastern Region. It is an Agricultural Ultralight Airfield belonging to GEL purposely for the spraying of its banana plantation. The airstrip has one runway which is oriented East/West (Runway 10/28), 300m long and 10m wide. The runway is a compacted laterite surface with a flat slope.

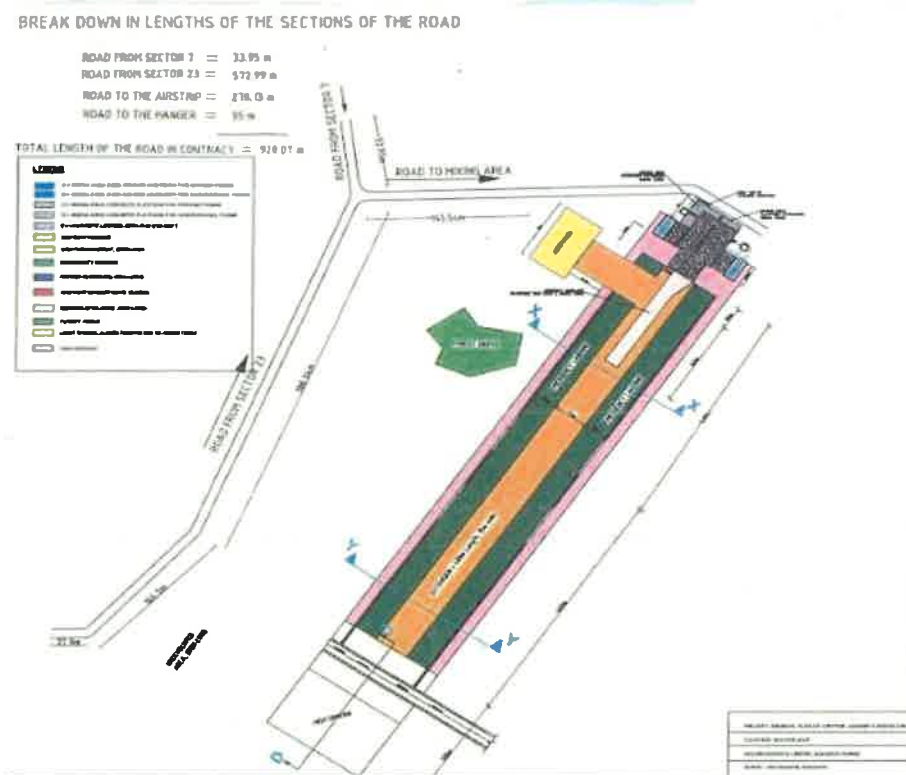


Figure 3: Kasunya Airstrip Information

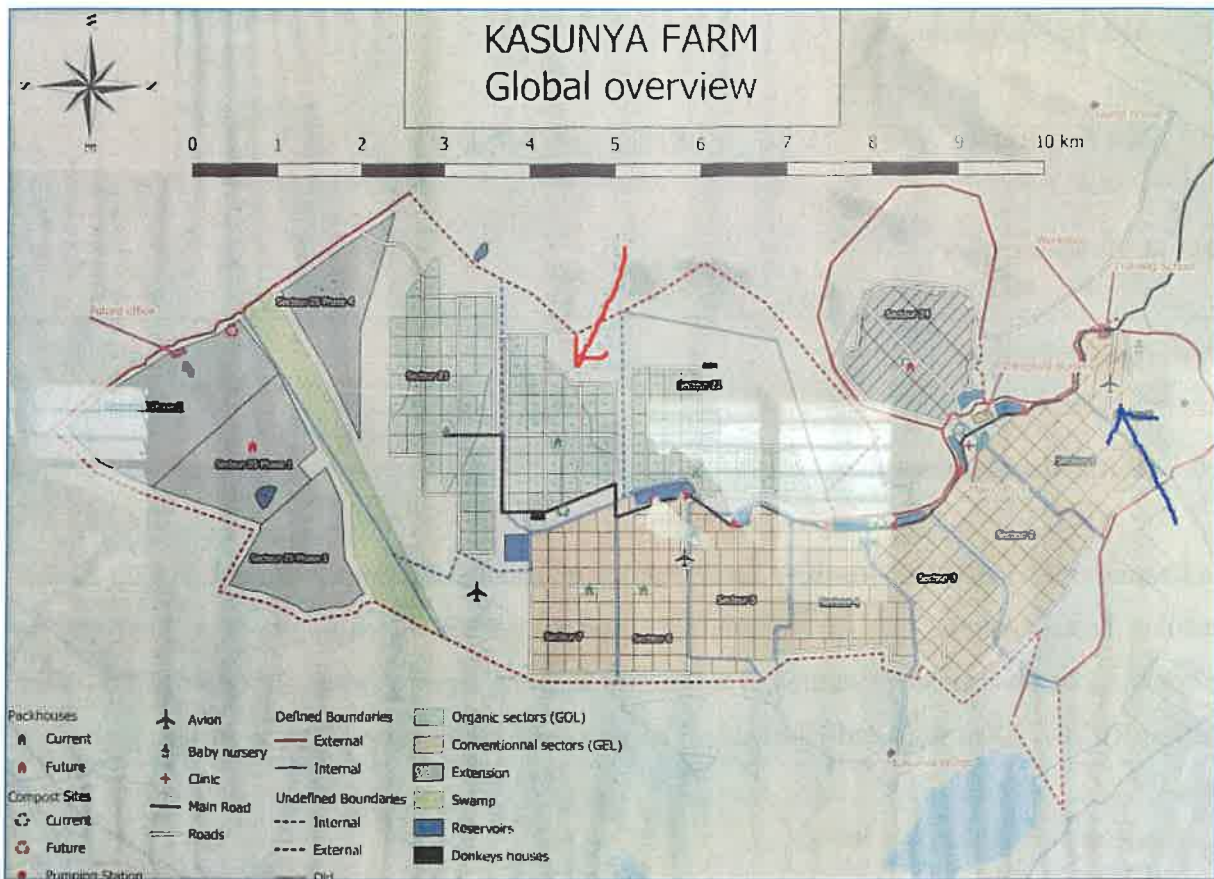


Figure 4: Aerial Map of Kasunya Farm (Red Arrow-Sector 22/Blue Arrow-Runway)

### 1.11 Flight Recorders

Not Applicable

### 1.12 Wreckage and Impact Information

The wreckage was located on the North-Western border of Sector 22 of the banana plantation. The aircraft made contact with a power line running above the canopy of the plantation, flipped over and crashed upside down into the farm. The aircraft caught fire and was destroyed. The aircraft was found upside down, burned with some debris scattered around it. There was no evidence of a full head-on impact with the ground. There was no evidence of pre-crash failure and no evidence of fire prior to contact with the power line and the ground. Part of the windscreen, the GPS console and a rib from a wing were scattered approximately within a radius of 8 feet from the wreckage.



Figure 5: Photos of aircraft wreckage

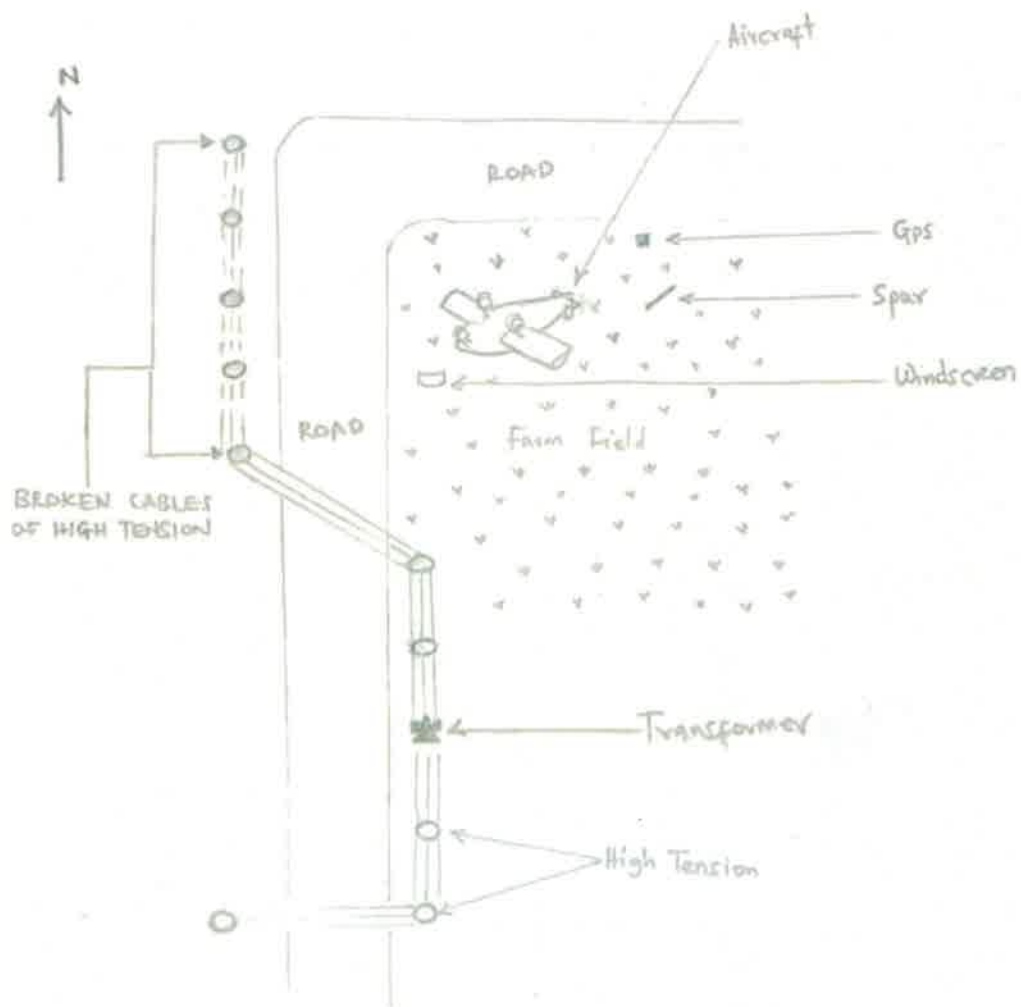


Figure 6: Wreckage Dispersal Diagram

### **1.13 Medical and Pathological Information**

The Pilot survived the impact with no injuries. He received observatory medical care at the farm's clinic and was discharged.

### **1.14 Fire**

There was a localized fire following the impact.

### **1.15 Survival Aspects**

The Pilot survived the incident with no injuries. The Pilot successfully unstrapped his seat belt and evacuated the aircraft to safety.

#### **1.15.1 Post Rescue Actions**

The manager of GEL immediately and accordingly informed GCAA about the accident. The preliminary investigation was conducted by officials of AIB. There was no toxicology test conducted on the Pilot. The PIT liaised with all the possible witnesses which facilitated the work of the Investigation Team.

### **1.16 Test and Research**

Nil.

### **1.17 Organisational and Management Information**

The subject aircraft is part of a crop-spraying operation operated by Travaux Services Aeriennes (TSA) of Cote d'Ivoire on behalf of Golden Exotics Limited (GEL). The aircraft is used for routine crop-spraying flights over the designated areas of the banana plantation in Asutsuare in the Eastern Region of Ghana. TSA is a holder of an Aerial Works Certificate issued by ANAC of Cote d'Ivoire. Since there is no Article 83 bis agreement in effect between Ghana and Cote d'Ivoire, ANAC maintains regulatory oversight over the operations of TSA.

However, TSA after being evaluated by the Ghana Civil Aviation Authority in May, 2019 was issued with a validation of their ANAC Aerial Works Certificate. Subsequently, renewals have been carried out based on the continuing validity of the ANAC issued Certificate.

The current GCAA Authorisation is valid until 4<sup>th</sup> May, 2022. GEL has also been issued with National Security Clearance from the Ghana Government to partner with TSA for their crop-spraying operations.

#### **1.18 Additional Information**

Nil.

#### **1.19 Useful or Effective Investigation Techniques**

Nil.



## 2.0 ANALYSIS

### 2.1 Introduction

This section discusses the factors which were found to have contributed to the accident, as well as other additional factors identified during the course of the investigation that were also considered to be important. The analysis performed is based on the pieces of evidence collected during the investigation.

The examination of the aircraft and the Pilot's account about the engine whiles in flight provided no evidence of any deficiencies or malfunctioning which could have affected the performance of the aircraft during the spraying, as all issues had been rectified in the days preceding the flight. The aircraft was properly certificated, equipped, and maintained in accordance with applicable regulations of Autorite Nationale De L' Aviacao Civil (ANAC), GCAA standards, and TSA company procedures. There was no evidence indicating that the aircraft experienced pre-impact failures of its structures, flight control systems, or engines.

The Pilot of the aircraft was properly certificated and qualified in accordance with applicable civil aviation regulations of ANAC, GCAA, ICAO standards, and TSA company requirements. There was no evidence to indicate that the performance of the Pilot was affected by any medical factors.

The prevailing weather for that day was VMC although the Pilot indicated prevalence of strong winds. A review of the evidence indicates that this accident was primarily attributable to the strong winds (weather), although some human factors were also identified. The analysis addresses the aircraft performance and the human factor issues i.e., the individual level and at the systemic organisational and management level.

### 2.2 Reduced Aircraft Performance

Though the Pilot made the correct flight input, the effect of the wind gust did not enhance the performance of the aircraft. The unforeseen gusty wind further forced the aircraft down. This resulted in the aircraft making impact with the power lines causing the accident.

## **2.3 Individual Human Factors**

The individual human factors that caused the accident were a combination of a lack of familiarity with the terrain as well as organisational and management factors.

### **2.3.1 Lack of Familiarity with Terrain**

The Pilot admitted to having very limited experience with the terrain at the Kasunya farms even though he had previously flown in Cote d'Ivoire where the power lines run at the same level as the canopy. The Pilot only received a video conference from the Chief Pilot whom he took over from. There was no opportunity for the Chief Pilot to have observed a familiarization flight or a spraying flight.

### **2.3.2 Stress**

The team was not able to meet their initial schedule as planned for the spraying of the field. They had lost three (3) days of spraying due to very strong winds in the preceding days. There was therefore an added pressure of making up for the lost time. Furthermore, the Pilot had done almost 2 and half hours of flying on the day of the accident. It is the opinion of the Investigation Team that there may have been a probable stress for the team while the Pilot may have suffered a probable stress induced fatigue.

## **2.4 Organisational and Management Factor**

The handing over from the Chief Pilot was done virtually over video and audio calls. The Chief Pilot therefore did not have an opportunity to observe the Pilot fly first-hand. Though the Pilot has considerable flight time on type, the Investigation Team is of the opinion that his flying hours on type under such aircraft operation is small and hence, inexperienced in relation to such operations and environment.

### 3.0 CONCLUSION

#### 3.1 Findings and Observations

1. The aircraft was spraying Sector 22 of GEL banana plantation when the accident occurred.
2. The Pilot was conducting his last flight for the day.
3. Handing over from the Chief Pilot was done over a video call.
4. The Pilot had only been flying for two (2) weeks at the Kasunya farm.
5. The Pilot was not very familiar with his area of operation.
6. The flight was conducted under VMC but the Pilot observed some wind gust.
7. The Pilot was properly certificated and qualified for the flight.
8. The maintenance records indicated that the aircraft was equipped and maintained in accordance with existing regulations and approved procedures.
9. There was no evidence of airframe failure or system malfunction prior to the accident.
10. The aircraft had no deficiencies or malfunctioning which could have affected the performance of the aircraft during the spraying.
11. The aircraft was flying at an altitude of about 12m and a speed of 120kph.
12. The aircraft was flying with a tail wind while in the West to East direction.
13. The Pilot was cognisant of the power lines which had been properly marked.
14. The Pilot proceeded to make the necessary control stick input to avoid the power lines.
15. The Pilot initiated a pull up but the aircraft response was slower than expected.
16. The aircraft was slow to climb because a wind gust from behind had slowed its ability to climb and resulted in striking the power line.
17. The aircraft flipped over and crashed upside down in the North-Western corner of Sector 22.
18. The aircraft caught fire on impact and was destroyed while the Pilot evacuated without injuries.
19. The Pilot received observatory medical care at the farm's clinic and was discharged.
20. There was no toxicology test conducted on the Pilot.
21. The manager of GEL informed GCAA of the accident who in turn notified the AIB.
22. Preliminary investigations were conducted by a team of AIB investigators.
23. The crash site was cordoned off, wreckage tagged and marked appropriately.

### 3.2 Causal Factors

It is the opinion of the Investigation Team that the accident was caused by **the effect of the sudden wind gust which restricted the aircraft from climbing** in order to clear the power lines leading to impact.

### 3.3 Contributory Factors

The factors that contributed to the accident include the following:

1. Unfamiliarity of terrain.
2. Probable stress resulting from the delays in operational time.
3. Probable stress-induced fatigue.

#### 4.0 SAFETY RECOMMENDATIONS

The following Safety Recommendations (AIB/SR/2022/01) are made:

- A. TSA should develop standard procedures which insist on face-to-face handing over and taking over for its Pilots and other related staff.
- B. TSA's face-to-face handing over and taking over procedure so developed should include at least one observatory operation for in-coming Pilots or related staff.
- C. TSA should continually update their personnel on human factors issues relating to stress and fatigue.
- D. TSA should develop a monitoring system to update itself on the operations of personnel and undertake precautionary measures where necessary.
- E. TSA should consider the use of alternative spraying methods such as unmanned aircraft for crop spraying.

## APPENDIX 1: INVITATION TO SERVE ON INVESTIGATION TEAM



AIB/2022/03/17/ACCID

**AIRCRAFT ACCIDENT AND INCIDENT  
INVESTIGATION AND PREVENTION BUREAU****MEMO**

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**FROM** : AG. COMMISSIONER ✓  
**TO** : UNDERLISTED INVESTIGATORS  
**DATE** : 28<sup>TH</sup> MARCH, 2022  
**SUBJECT** : COMMENCEMENT OF INVESTIGATION INTO AIRCRAFT SERIOUS INCIDENT INVOLVING TRAVEUX ET SERVICES AERIENS AIRCRAFT TU-LAB THAT OCCURRED ON THE 17<sup>TH</sup> OF MARCH 2022 AT 08:12 (LOCAL TIME) AT THE KASUNYA BANANA FARM

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In accordance to with section 17(b) of the Aircraft Accident and Incident Investigation and Prevention Act 220, Act 1028, the commissioner is granted the powers to institute an investigation into Aircraft Accidents or Incidents that occur in Ghana. Additionally, the international civil aviation organization (ICAO) Annex 13 mandates that a state established institution of aircraft accident and incident investigation should carry out this function. Consequently, the Aircraft Accident and Incident Investigation and Prevention Bureau (AIB) has commenced investigation into the aircraft accident involving Traveux Et Services Aeriens aircraft TU-LAB that occurred on the 17<sup>th</sup> of March 2022 at 08:12 (Local Time) at the Kasunya Banana Farm.

2. Accordingly, the AIB has forwarded notification of the incident to the state of registry, state of operator, State of design, State of Manufacture and ICAO, and has its indication of the extent of investigation to be conducted.
3. In order to ensure an effective management of the process through the commissioner, the underlisted investigators have been nominated to conduct the investigation.



## AIRCRAFT ACCIDENT AND INCIDENT INVESTIGATION AND PREVENTION BUREAU

- |                                  |   |                        |
|----------------------------------|---|------------------------|
| 1. Mr. Ellis Hugh Tamakloe       | - | Investigator-in-charge |
| 2. Mr. Eric Ewusie               | - | Investigator           |
| 3. Sqn. Ldr. Prince Kyei Baffour | - | Investigator           |
| 4. Mr. Joseph Malik Awudu        | - | Co-opted member        |
| 5. Capt. Kojo Appau              | - | Co-opted member        |

4. To fulfil 5(e)(f)(h) of Act 1028, the investigation should focus on the determination of the causes and contributing factors to the incident, preparation report and safety recommendations where applicable.

5. You are therefore expected to complete your investigation and submit a final report by 29<sup>th</sup> April, 2022.

Thank you

AKWASI A. PREMPEH  
AG. COMMISSIONER

### DISTRIBUTION

- |                               |   |           |
|-------------------------------|---|-----------|
| Mr. Ellis Hugh-Tamakloe       | - | AIB GHANA |
| Mr. Eric Ewusie               | - | AIB GHANA |
| Sqn. Ldr. prince Kyei Baffour | - | AIB GHANA |
| Capt. Kojo Appau              | - | GCAA      |
| Mr. Joseph Malik Awudu        | - | GCAA      |

**APPENDIX 2: NOTIFICATION OF AIRCRAFT ACCIDENT**

*In case of reply, the number and date of this letter should be quoted.*



**AIRCRAFT ACCIDENT AND INCIDENT INVESTIGATION AND PREVENTION BUREAU**

**TEL: +233 (0) 50 239 6070  
+233 (0) 57 200 0888**

**TOLL FREE No: +233 (0) 88 800 6007**

**DATE: 23<sup>RD</sup> MARCH, 2022**

*MY REF. No.* AIB/2022/03/17/S/INCID  
*YOUR REF. No.* .....

**Director General,  
ANAC  
Abidjan  
La Cote D'Ivoire**

**Email: info@anac.ci**

**Dear Sir/Madam,**

**NOTIFICATION OF AIRCRAFT SERIOUS INCIDENT**

The Ghana Civil Aviation Authority (GCAA) has notified the Aircraft Accident and Incident Investigation and Prevention Bureau of an aircraft serious incident involving an Ivory Coast aircraft with registration TU-LAB (single seater ultralight) used for crop spraying at Kasunya Banana Farm.

Please find below details about the Civil Aircraft Accident which occurred in the early hours of the day at Kasunya.

a) Occurrence Type	<b>SINCID</b>
b) Manufacturer, model, nationality and registration marks, and serial number of the aircraft	Ultralight, <b>TU-LAB</b> , HUBERT AVAITION, <b>MDC-912STA</b> , 13007
c) Name of owner, Operator and Pilot, if any, of the aircraft	<b>TRAVAUX ET SERVICES AERIENS</b>
d) Name, qualification of the pilot-in-command and nationality	<b>BAKHITAOUTI YASSIN MOHAMMED, FRANCE, CPL(A) &amp; PPL(A)</b>
e) Date and time (local time or UTC) of the accident or incident	17 <sup>th</sup> March 2022 at 08:12 (Local Time)
f) Last point of departure and point of intended landing of the aircraft	Kasunya Banana Farm
g) Position of the aircraft with reference to some easily geographical point and latitude and longitude	Northwest corner of the Field C3
h) Number of crew and passengers; aboard, killed and seriously injured; others, killed and seriously injured	1 crew member Pilot disembarked with no injuries upon touchdown
i) Description of the accident or incident and the extent of damage to the aircraft so far as is known	Between hours of 7:30am and 8:00am, an ultralight registered TU-LAB was performing crop spraying activities in Kasunya banana farm. Toward the end of his treatment, the aircraft hit accidentally a power line (which was marked) and fell to the ground. A fire broke out when the aircraft touched the ground.



j)	An indication to what extent <b>the investigation will be conducted or is proposed to be delegated by the State of Occurrence</b>	Minor-scaled Investigation <b>to be conducted by the Aircraft Accident and Incident Investigation and Prevention Bureau of Ghana.</b>
k)	Physical characteristics of the accident or incident area, as well as an indication of access difficulties or special requirements to reach the site	Clear weather condition
l)	Identification of the originating authority and means to contact the investigator-in-charge and the accident investigation authority of the State of Occurrence at any time	The Commissioner Aircraft Accident and Investigation and Prevention Bureau P.O. KA 16412 Kotoka International Airport +233 27 100 0888 <a href="mailto:info@aibghana.gov.gh">info@aibghana.gov.gh</a>  Investigator-In-Charge Mr. Ellis Hugh-Tamakloe +233 20 811 9930 <a href="mailto:Ellishugh-tamakloe@aibghana.gov.gh">Ellishugh-tamakloe@aibghana.gov.gh</a>
m)	Presence and description of dangerous goods on board the aircraft	<b>Chemical</b>



**AKWASI A. PREMPEH  
AG. COMMISSIONER**

**CC:**  
BRP-ROTAX GMBH & CO RG  
Rotaxstrasse 1  
4623 Gunskirchen  
Austria.

Humbert Aviation  
1, rue du Mendil  
83160 Ramonchamp  
France.

Bureau Enquetes et Analyses des Accidents et Incidents d'Aviation  
Route de l'Aéroport FHB d'Abidjan  
07 BP 148  
Abidjan 07  
Cote d'Ivoire

Autorité Nationale de L'aviation civile de Cote d'Ivoire  
Ministère des Transports  
7355 + GJW  
Abidjan  
Cote D'Ivoire  
[notificationincidentsurete@ansc.ci](mailto:notificationincidentsurete@ansc.ci)

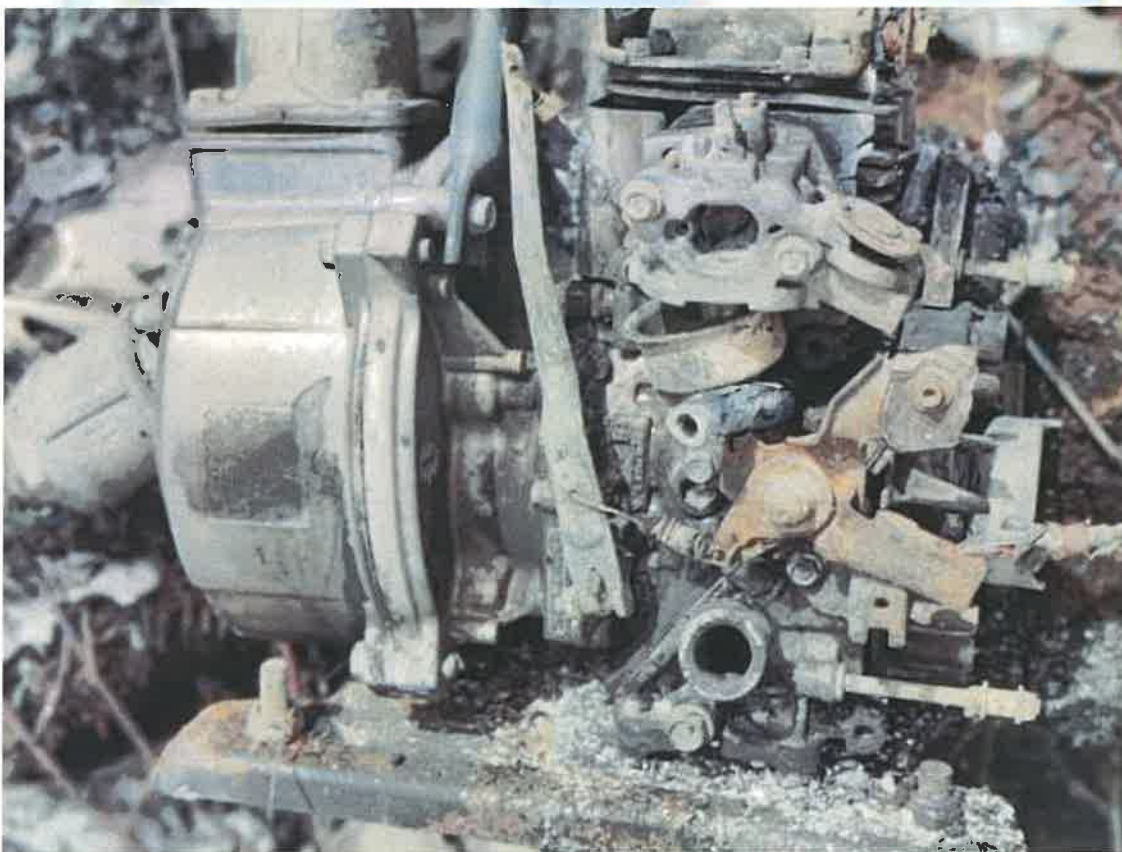
**APPENDIX 3: PICTURES**













**APPENDIX 4: TRANSCRIPT OF INTERVIEW WITH ON 21 MARCH 2022 CHIEF PILOT AND PILOT AT AIB.**

Investigation Team: Can you tell us exactly what happened?

Pilot: I have been working at GEL since February and was replacing the chief Pilot. We had a briefing concerning the farm operations and obstacles 20 February and all processes related to the operations on the field. I came at the beginning of March and I was supposed to 3 rotations over the 700 hectares fields. The first rotation was okay. On the five day of the second rotation, I was treating sector 22. I have to do ten charges on this field and I was on the seven charge of the day and from the East to West direction. During the pass over the canopy of the field 3m to 5m and the wind was beginning to blow slightly on the air field and the banana as well and on the last charging it went a little stronger. I was finished and I was doing pass number 76 and it is like almost the end of the field as you have with the location of the crash. I was doing the low pass with the wind from my right and my back. we spray at 110kph Indicated Airspeed (IAS) When I check the GPS, we have 120-125kph Ground Speed (GS) and there was some mechanical turbulence induce by the wind. I have been doing passes like over an hour and over this power line. Every other pass the wind is coming from my back and from the front. On this pass the wind was coming from my back, I check the GS and IAS and I see the power lines with the big red and white signal ball. I pull the stick back early in enough to anticipate the higher GS but I think I didn't anticipate early enough because when I pull back, I saw the airspeed fall a little and fell some gust from coming from the back which seem to pin me to the canopy and held me down and the aircraft did not climb as usual like the other passes I did before. I saw that I was low and the power lines was coming into me. I heard a very big balm and big noise with blue electric sparks everywhere and I fell a very strong pitch down attitude. The ground was coming at my minus 90-degree attitude, the banana plants and ground. I ended up on the back still strapped to the aircraft and arm of the pellock. Immediately, the product spill over me and right after that maybe 2-3 seconds the fire start to burn. I fell the heat and the fumes. I saw that I was not hurt or anything and still conscious so I unbuckled myself and try to quickly get out and ended up on the road just next to the power line.

Investigation Team: Prior to the take off and the operation, was everything okay in the aircraft?

Pilot: The aircraft was behaving like it did before the day before and two days before. It had some mechanical issues but it was dealt with by the ground mechanics and I did some small test flight



and did spraying for about an hour and forty minutes starting around 6 a.m. and the accident occurred at about 8:15 a.m. So, I have been spraying like more than 2 hours. We have been refuelling the aircraft 10 or 15 minutes before, usually we do about 2 hours of spraying or crop dusting and then stop the aircraft then refuel it and continue.

Investigation Team: What is your normal altitude of spraying?

Chief Pilot: Between 3 and 5m above the canopy of the banana plants and this is put the aircraft just about the same height as the power lines. So normally we just have to anticipate when we are getting to the end and pull up just a little to avoid the power lines.

Investigation Team: Do you spray parallel to the power line or you do it in some kind of pattern?

Pilot: The pattern that is used here is to spray perpendicular to the power lines due to the shape of the plantation. So, we do East to West or vice versa pattern.

Investigation Team: Do you have any kind of operating procedures for the work you do here?

Chief Pilot: Yes

Investigation Team: What is the name of this procedure book?

Chief Pilot: It is called Specific Operations Manual.

Investigation Team: Are you very familiar with the procedures in this manual?

Pilot: Yes, I was abiding by the procedures in this manual. The SOP clearly says that he recommends height above the canopy should be 3-5m.

Investigation Team: How long have you been doing this work?

Pilot: I started in November last year but I was still at a younger experience because I have 130 flying hours on this type and 120 hours of spraying operations. And have been in Ghana since beginning of March. I have only been here two weeks on this farm but I have been doing banana plantation spraying in Ivoire Coast with same similarities in the plantation length and wind, but in Ghana I only started on the 2 March. And that's why I got the briefing from the chief Pilot on the operations here and about the obstacles. The briefing that he gave was very specific and pointed out all the obstacles and what to look out for and how to avoid in terms of the flying and to remain very safe.

Investigation Team: Did he observe you do any flight before?

Chief Pilot: No, I had already left for my leave.

Pilot: He called on a video call after the first 2 days to enquire if everything was going on smooth both operations and accommodation but we didn't get to meet in person.

Investigation Team: Are you saying the briefing the chief Pilot gave to you was on phone?

Pilot: WhatsApp using the documents from the company, it was like a zoom meeting.

Chief Pilot: I project all the areas maps of the plantation, highlighting the various obstacles on the farm and procedures to do the spraying on the field. He was given the first briefing by the operations Manager in Ivoire Coast in person and when he was in France, I also gave him the video conference briefing.

Investigation Team: When did you leave Ghana and when did he take over?

Chief Pilot: 20 February

Pilot: 1 March

Investigation Team: Did you meet him in Ivoire Coast?

Chief Pilot: I only met him one time in December last year when he flew the aircraft here. By the time he was coming to Ghana I was already in France.

Investigation Team: How long have you been working on the field?

Chief Pilot: For about three years now starting like October 2019, resident in Ghana.

Pilot: I have been flying in Abidjan since November last year. Am based in France and work in Abidjan. I am a new Pilot that have been employed not long ago.

Investigation Team: Are the environmental characteristics on Abidjan and Ghana the same?

Pilot: In GEL, there are arranged specific but in the plantation in Abidjan, it is in order of cycles, like trees, pack houses and factories which are in the plantations. I was not use to the specific lay out in GEL but I was used to obstacles on the plantation. The plantation in Abidjan have short power lines and I think in GEL; the wind can get gusty that in Abidjan because of the flat ground in Ivory Coast. The Abidjan plantation is like in the middle of savannah and forest so the trees can limit the wind but in GEL, the plantation is very big and at the end of the plantation which is like downwind,

the wind can be very light and the other wind which is like upwind with only flat land to enter into the wind, the wind can be pretty strong and gusty.

Investigation Team: Have you worked on plantation in Ivory Coast?

Chief Pilot: Yes, I worked there for 8 years.

Investigation Team: Did you discussed things pertaining to orientation to help him take over from you?

Chief Pilot: Yes, the orientation is just the same like Ivory Coast, just that her in Ghana sometimes the wind is stronger or gusty but the conditions are the same. In Ghana, you know the situation of the plantation, we are in the middle of nowhere and so sometimes the wind is very strong and there is nothing to block it. In Ivory Coast is not the same you have some forest or something like that and limit the wind and sometimes the wind is less strong. In Ivory Coast you have very big trees about 200m around the plantation.

Investigation Team: Are the threats in Ivory Coast higher than in Ghana?

Pilot: I will that they are not the same, it not different.

Chief Pilot: It is not and we have some different, due to the wind and the height of the trees in Ivory Coast and we have difference here too because we are in the middle of the bush and the wind too sometimes it is stronger but basically the job is the same.

Investigation Team: Are the obstacles, I mean the power lines the same in term of orientation?

Chief Pilot: Yes, in terms of appearance and everything.

Pilot: I will say that it is the same. But in the Ivory Coast plantation the power lines lie a little low to the ground short, lower voltage and three wires but together which is like lower to the canopy.

Chief Pilot: The Pilot in fact does not know all the plantation in Ivory Coast, he just worked on only one.

Pilot: Yes, because in Ivory Coast on some of the plantations there, there are exactly the same kind of power lines but I didn't work on them. I have not operated on any farm with this kind of high-power lines than the canopy before. In another farm, sukapain that I worked the power lines are not on the plantation like this place or the other farm I worked on. But in this farm also there were

some irrigation cables which is about the same height like power lines. But I have not been operating on banana plantation with these kinds of Power lines in Ivory Coast.

Investigation Team: Did the chief Pilot give you all this kind of information with regards to orientation and obstacles?

Pilot: Yes, he gave me all the briefing concerning everything, maps obstacles yea, I mean everything.

Investigation Team: With your experience, would everything had been okay except for the sudden wind?

Pilot: Yes. I have been late on schedule because the aircraft was on maintenance. We were supposed to have 6 days on spraying but we did on the first rotation and was okay. Even on the first rotation I usually do one area but 6 areas to spray and we do two and two and half hours. During the first rotations we had some days to stop because the wind was blowing too much on the plantation and we started at 6 a.m. and stopped before half pass seven because the wind was too strong for an effective spraying and I didn't feel that safe during the upwind due to the turbulence. Then we get three days rest, Tuesday, Wednesday and Thursday. Then we started the second schedule on Friday but on Saturday we had an issue with the aircraft and we had to call the chief mechanic from Abidjan. We troubleshoot and study the issue from Saturday to Monday and then resume on Tuesday. But the initial schedule was to be on Wednesday but we were late so we had to do it to recovery the days we lost. Instead of spraying one sector per day we were doing two sectors a day and in fact I did one and half sector because of the wind at 9a.m. and 9:30a.m. the wind was getting stronger and gusty, I couldn't continue safely. And it was on the Tuesday and Wednesday and same as the day of the accident, which was on Thursday. This is the power line, this is conventional 1300hectares but I was doing 700hectares which is all the area left of this part. This is sector 21, then 1 and then 2, this is sector 22, three, four, sector 23 then five and six basically an imaginary line to separate the areas because doing one sector will be five hours which is too much for one day. On the day of the accident I have been finishing sector 21 then 22. I have been taken off from there then over this reservoir and using the right race track pattern. We use the GPS to do what we call an AB line. We plot the A and B line which is parallel to give us a sort of guidance and then I was starting line 40 to line 78 and doing a right race track and was doing 40 60 41 61 42 62 and so on, then return to the field after the spraying. I was on like the seven charges doing 60, 59 and finishing 74 to 78 and then was coming here and I said that sometimes the wind blows from this direction.

This is a very flat area and this is rough area because of the banner. On the airfield you are quite protected from the wind when you take off and land and even when you are on this side of the plantation of the airfield the wind blows less than when you are on the other side. I was treating to the East, then I saw the power line, I mean I saw it and it was coming into me and I look at GS and I knew I had to pull earlier because of the wind blowing back but when I pull I initial started to climb shallower than expected then some kind of very strong gust in the climb then I felt that I was like pin down to the canopy and that what happened. I was like working at not so ideal conditions to be on schedule because the next treatment was like Sunday and if I was doing one sector a day I would finish on Saturday. If you spray too close, they stick to the banana because of the product and if you wait long the disease can spread. So, I was trying to arrange things for the next schedule and not to wait like the delay between the previous one that I did.

Investigation Team: What day were you in Ghana?

Pilot: I came to Ghana on 28 February to Accra then 1 March on the beginning of the day I came to the plantation. Then I get briefing from the people in charge for accommodation and the airfield. And like I said earlier I was quite familiar with the airfield because I brought one aircraft to the Chief Pilot for maintenance purposes.

Investigation Team: When did you start your work on the farm?

Pilot: I started my work on 2 March one sector per day and finished on Monday morning which is 7 March, 2 and half hours of flight time per day starting at 6a.m. and finishing at 830a.m. to 9a.m. then I get 3 days off.

Investigation Team: On 7 March what happened?

Pilot: I finished all the sectors which is six sectors in total doing one sector a day.

Investigation Team: After the 7 March what happened?

Pilot: On the schedule I get a three days break which is 8 9 10 March.

Then on the 11 March I started on the second schedule and I begin and finish on the same day for sector 5 because I was very conversant with this sector. On the 12<sup>th</sup> we come to the plantation at dawn, the beginning of the day and we did all the pre-flight then during the pre-flight there was an issue on the carburettor. I saw that there was an overflow on the carburettor.

We saw that the aircraft needed extensive work so on Saturday we didn't start spraying but we did maintenance on the aircraft on the 12th. So, we call the guy to come from Abidjan and he came on the 13 March in the afternoon. And they finished on the 14 March. But there is a fact that we didn't spray for 3 days. They finished on the Monday which 14 and we did a small test flight to the engine is running well and everything was okay and they sign off on the aircraft to resume operations. So, maintenance started on the 12 and finished on the 14 and they did all the paper works and we resume work on the 15<sup>th</sup> March but now late by 3 days according to the schedule. That's why I get a new schedule which is like two sectors per day. On 15 and 16 and one sector on 17 but because of the temperature and the wind. The temperature not for the aircraft but for the banana, if it is too hot spraying is not effective and its for operational and above 30 degree we stop, just because it can burn the banana, so we usually start at 6a.m. So, the schedule changed because of the delays for the maintenance so to get back for the days lost we had the new schedule of 2 sectors per day instead of 1 sector from the 15 to 17 March.

Chief Pilot: it is always a good ideal if the weather conditions are good then he can do two sectors per day but if the conditions of the weather is not good then he should stop.

Investigation Team: Was there any problem with the aircraft on the day of the accident?

Pilot: There was no issue, the aircraft has been fixed and it was okay. We ever I feel unsafe about an aircraft I prefer the mechanic to work on it. Maintenance was quite extensive and the mechanic requested that the chief mechanic come from Abidjan to assist because the work was so quite big for him. The aircraft was behaving well just like the day before and according to the maintenance manual.

Investigation Team: Do you have resident mechanic?

Pilot: Yes, but he made it clear that he was not confident in dealing with the issue which I respect, so he requested for the chief mechanic to come and assist than try to improvise.

Chief Pilot: the mechanic in Ghana is for only small maintenance work but for serious issue we call the chief mechanic from Abidjan to solve the issue.

Investigation Team: In your judgement what do you think may have caused the accident?

Pilot: I think what cause the accident was that I continue to fly with not so optimal conditions for the aircraft. So, I get surprise with the wind from the back which was gusty which lower my IAS and lower my flight path into the power lines. It was unexpected. Sometimes you face some turbulence because of the wind but it was not strong compare to this one.

Investigation Team: When you came out of the aircraft, what happened?

Pilot: I saw myself plunging to the ground and the nose of the aircraft was pointed down. The cable reinforcement in the plantation for the canopy sort of hold me in a position up from directly hitting the ground and I was conscious during all this time but just disoriented and when I become oriented, I felt some liquid I think it was gasoline and started to feel the heat, so I unbuckled myself according to the ground upside down and the fire started simultaneously and I run to safety.

Investigation Team: Has there been any other crash on the farm before?

Chief Pilot: yes, it was also a similar accident but not with an electric line but a cable that is on the canopy top.

Investigation Team: Have you had any situation like this before?

Pilot: Never

**APPENDIX 5: APPROVAL FOR TSA BY GCAA***Ghana Civil**Aviation Authority*

Our ref: AIR 4005/057/42

Your ref:

Dig Add: GL-133-7178

5<sup>th</sup> May, 2021

The Accountable Manager  
Golden Exotics Limited  
P. O. Box KIA 16105  
Accra-Ghana

Dear Sir,

**APPROVAL FOR TSA TO CARRY OUT CROP SPRAYING OPERATIONS IN GHANA**

The Authority grants you approval to conduct crop-spraying operations on your farms in Ghana using the under-listed aircraft operated by Travaux Et Services Aeriens (TSA)

**M. D. C. 912 STA**

No.	Registration Markings	Serial Number
1	TU-LAA	13510
2	TU-LAB	13007
3	TU-LAC	13107
4	TU-LAG	01191

**TURBO THRUSH S2R-T34**


No.	Registration Markings	Serial Number
1	TU-GAG	T34-370
2	TU-GAA	T34-289

Please note that this Approval expires on 4<sup>th</sup> May, 2022 and therefore supersedes your previous approval AIR 4005/057/034 dated 5<sup>th</sup> June, 2021.

Golden Exotics is to note that, the renewal inspection shall be carried out within the approval period as stated in our letter with reference AIR 4005/057/14 and dated 8<sup>th</sup> September, 2020.

Please be guided accordingly.

Yours faithfully,

  
KOFI DANSO  
AG. DIRECTOR, SAFETY REGULATION  
FOR: DIRECTOR-GENERAL

CC: DIRECTOR-GENERAL  
DEPUTY DIRECTOR-GENERAL (TECHNICAL)

Private Mail Bag  
Kotoka International Airport  
Accra, Ghana

Tel: (233) (30) 2776171  
Fax: (233) (30) 2773293  
Email: info@gcaa.com.gh

Star: ACCITY  
AFIN: DGAAYFX  
Website: www.gcaa.com.gh

Ensuring the highest level of Safety & Security. Our Priority.



APPENDIX 6: APPROVAL FOR TSA BY ANAC

**REPUBLIQUE DE CÔTE D'IVOIRE**  
Union - Discipline - Travail

**MINISTRE DES TRANSPORTS**  
AUTORITÉ NATIONALE

**AGREMENT DE TRAVAIL AERIEN**

N°: ATA/TSA/2019-002/ANAC/DSV *1100*  
Le présent Agrément atteste que la société

Date d'expiration : **23 SEPT 2022**

Nom commercial : TRAVAUX ET SERVICES AERIENS (TSA)  
 Adresse de l'exploitant : 30, Rue Toussaint Louverture, Plateau-Indenité-26 BP 560 ABIDJAN 26  
 Téléphone : +225 07 57 86 65 10  
 Fax : + 225 27 20 20 40 59  
 Courriel (e-mail) : contact@tsa-cl.com

a fourni les preuves juridiques, a démontré sa capacité technique et s'engage à observer les lois et les règlements en vigueur en République de CÔTE D'IVOIRE.  
 En foi de quoi, le présent Agrément lui est délivré et lui donne droit à l'exercice d'activités de travail aérien, telles que décrites dans son manuel d'activités particulières.  
 Le présent Agrément n'est ni cessible, ni transférable.  
 La durée de validité du présent agrément est limitée à douze (12) mois, sauf s'il a auparavant été restitué, annulé, remplacé, suspendu ou révoqué.

Date de délivrance : **24 SEPT 2021**

LE DIRECTEUR GENERAL DE L'AUTORITE NATIONALE DE L'AVIATION CIVILE

  
**Sinaly SILUE**  


**APPENDIX 7: SUMMARY OF AIRCRAFT MAINTENANCE RECORDS**

TSA CAMO







**AIRCRAFT TYPE** : ULM – Moto du ciel  
**MSN / N° de Série** : 13007  
**REGISTRATION** : TU-LAB  
**A/C TSN / Temps total** : 3540.2  
**A/C CSN / Cycle total** : 9359

**DOSSIER DE VISITE N°**  
 work package N°  
**V50-LAB-002**

**Ordre du bon de commande** : voir réf. bon de commande  
Work Package Order  
**Description du travail** : VISITE 50 FH  
Work Description

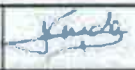
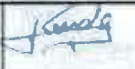

**Début** : 15.03.2022  
Started on  
**Fin** : 16.03.2022  
Finished on

		<b>BON DE COMMANDE DE TRAVAUX</b> <i>Work Order</i>		Réf : 013-22 Ed. : 1
IMMATRICULATION <i>Registration</i>	TYPE AVION <i>A/C Type</i>	MSN	SITUATION AVION <i>Aircraft status</i>	
TU-LAB.	ULM	13007	TEMPS TOTAL <i>Time Since new</i> 3540.6	CYCLES <i>Landings</i> 939
MANUEL D'ENTRETIEN APPLIQUE : <i>Applied Maintenance Manual</i>			DATES DES TRAVAUX <i>Date of works</i>	
ED N° : 1 <i>Edition</i>	AMDT : 0 <i>Revision</i>	DATE : 15/09/1999 <i>Date</i>	DEBUT : 15.03.2022 <i>Beginning</i>	FIN : 16.03.2022 <i>End</i>
SOUS-TRAITANT DESTINATAIRE : <i>Designated subcontractor</i>				
<b>TRAVAUX DEMANDES</b> <i>Technical Work required</i>				
IDENTIFICATION <i>Identification</i>	NB D'ITEMS <i>Nb of Items</i>	DESCRIPTION ET REFERENCES <i>Description and references</i>		
VISITE(S) D'ENTRETIEN <i>Maintenance check(s)</i>	1	VISITE 50 HEURES SELON PROTOCOLE DE VISITE		
CHANGEMENT(S) MOTEUR(S) <i>Engine(s) change(s)</i>	0			
CHANGEMENT(S) HELICE(S) <i>Propeller(s) change(s)</i>	0			
CN/AD <i>Airworthiness Directives</i>	0			
SB, FACE, STC... <i>SB, Modification, Repair...</i>	0			
EQUIPEMENT(S) A POTENTIEL <i>Life Time Component(s)</i>	0			
INTERVENTION(S) HORS PROTOCOLE <i>Supplementary items</i>	0			
RESPONSABLE LANCEMENT <i>Launch Manager</i>	RESPONSABLE ATELIER ULM <i>Workshop Manager</i>	RESPONSABLE NAVIGABILITE <i>Airworthiness Manager</i>		
NOM : Louis TOSSOU DATE : 14 / 03 / 2022 VISA : 	NOM : KINDO Adama. DATE : 15.03.2022 VISA : 	NOM : TOSSOU Louis. DATE : 16/03/22 VISA : 		

TSA CAMO

	<b>LISTE DES PERSONNES SUR LE CHANTIER</b>  <b>CHECK STAFF</b>
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Type Avion: Aircraft Type:	ULM	Visite: Check:	50 FH	Client: Customer:	TSA
Immatriculation: Registration:	TU-LAB	Date de visite: Date of check:	Du From: 15/03	Au To: 14/04/22	N° de dossier: W/P Nbr: V50-LAB-002

	Nom Name	Prénom First Name	Trigramme Identification Nbr	Signature
<b>Responsable Visite</b> Check Manager	KINDO	ADAMA	KAD	
<b>Contrôleur(s)</b> Inspector(s)	KINDO	ADAMA	KAD	
	1			
<b>Mécaniciens</b> Mechanics	TODRISU	MORO	LOHA	
<b>Mécaniciens</b> Mechanics				
<b>Chaudronnier(s)</b> Sheet Metal smith(s)				
<b>Autres / Aide-mécaniciens</b> Others / help-mechanician				



Liste de tâches Protocol 50 FH-MDC 912 SERIES

Type A/C :	ULM -Moto du ciel	MSN	13007	Immatriculation	TU-LAB
N° Dossier	V50-LAB-002	Visite	50.FH	Operateur	TSA

Item n°	DESCRIPTION	PERSONNEL			
		DATE	NOM	VISA	CONTRÔLE
<b>A CELLULE</b>					
1	Extérieur de l'ULM	15.03.2022	KAD	<i>[Signature]</i>	
2	Structure de l'ULM	15.03.2022	KAD	<i>[Signature]</i>	
3	Ceintures de sièges et bretelles de harnais	15.03.2022	KAD	<i>[Signature]</i>	
4	Garnitures, structures et embases des sièges	15.03.2022	KAD	<i>[Signature]</i>	
5	Paliers de manche pilote, poulies, câbles et tendeurs.	15.03.2022	KAD	<i>[Signature]</i>	
6	Tableau de bord, supports amortisseurs, trousse de masses, plaquettes.	15.03.2022	KAD	<i>[Signature]</i>	
7	Niveau électrolyte batterie	15.03.2022	IDM	<i>[Signature]</i>	<i>[Signature]</i>
8	Contrôle de la batterie et charge si nécessaire (3 à 5 Amp / 12 V)	15.03.2022	KAD	<i>[Signature]</i>	
9	Batterie et ses câbles	15.03.2022	IDM	<i>[Signature]</i>	<i>[Signature]</i>
<b>B COMMANDES</b>					
10	Décalcomanies et étiquettes	15.03.2022	KAD	<i>[Signature]</i>	
11	Ensembles palonniers et timonerie	15.03.2022	IDM	<i>[Signature]</i>	<i>[Signature]</i>
12	Revêtement extérieur des gouvernes.	15.03.2022	KAD	<i>[Signature]</i>	
13	Contrôle de la commande des gaz.	15.03.2022	KAD	<i>[Signature]</i>	
14	Remplacement du câble de gaz avant.	NA	KAD	<i>[Signature]</i>	
15	Inspection visuelle des câbles de commandes. (2 d'aileron, 2 de direction, 1 de piqué et 1 cabré)	15.03.2022	KAD	<i>[Signature]</i>	
<b>C HELICE</b>					
16	Plateau d'hélice	16.03.2022	KAD	<i>[Signature]</i>	
17	Pales	16.03.2022	KAD	<i>[Signature]</i>	
18	Contrôle du serrage des vis de fixation	16.03.2022	KAD	<i>[Signature]</i>	
19	Contrôle du voile d'hélice	16.03.2022	KAD	<i>[Signature]</i>	
20	Procéder à un équilibrage dynamique, avec vérification de l'alignement de l'hélice.	16.03.2022	KAD	<i>[Signature]</i>	
<b>D TRAIN D'ATERRISSAGE</b>					
21	Carénages et roues du train principal	15.03.2022	KAD	<i>[Signature]</i>	
22	Roue de train avant, tiges d'orientation, carénage	15.03.2022	IDM	<i>[Signature]</i>	<i>[Signature]</i>



## Liste de tâches Protocol 50 FH-MDC 912 SERIES

Type A/C :	ULM -Moto du ciel	MSN	13007	Immatriculation	TU-LAB
N° Dossier	V50-LAB-002	Visite	50 FH	Operateur	TSA

Item n°	DESCRIPTION	PERSONNEL			
		DATE	NOM	VISA	CONTRÔLE
23	Roulements de roues.	15.03.2022	KAD		
24	Pneumatiques	15.03.2022	KAD		
E	CIRCUIT CARBURANT	DATE	NOM	VISA	CONTRÔLE
25	Crépine carburant, robinets de commande.	15.03.2022	KAD		
26	Mise à l'air libre des réservoirs, bouchons.	15.03.2022	KAD		
27	Contrôle du filtre à essence et du bol décanteur.	15.03.2022	KAD		
F	VERIFICATION EXTERIEURE DU MOTEUR	DATE	NOM	VISA	CONTRÔLE
28	Vérifier les vis, écrous, de toutes les parties extérieures, du fil de freinage et remplacement si nécessaire.	15.03.2022	KAD		
G	INSPECTION VISUELLE DU MOTEUR	DATE	NOM	VISA	CONTRÔLE
29	Inspection générale de dommages, anomalies, extérieurs des cylindres pour le refroidissement, criques éventuelles, etc.	15.03.2022	KAD		
30	Inspection des capteurs de pression et températures, ainsi que des connexions électriques.	15.03.2022	KAD		
31	Vérification des durites d'eau, fuites, craquelures, porosité, et colliers de serrage.	15.03.2022	KAD		
32	Vérification de fuite éventuelle à la base de la pompe à eau.	15.03.2022	KAD		
33	Vérifier le vase d'expansion, le niveau de liquide de refroidissement, compléter si nécessaire, vérifier le bouchon du vase d'expansion, et la languette en caoutchouc placée dessous.	15.03.2022	KAD		
34	Vérification du bocal de refoulement de liquide refroidissement pour anomalies, dommages. Vérifier le niveau de liquide et compléter si nécessaire. Vérifier la durite entre le vase d'expansion et la bouteille de trop plein. Vérifier que la mise à l'air libre n'est pas obstruée.	15.03.2022	KAD		
35	Vérification des durites d'huile, fuites, craquelures, porosité, et colliers de serrage.	15.03.2022	KAD		
36	Vérification des durites d'essence, fuites, craquelures, porosité, et colliers de serrage.	15.03.2022	KAD		
37	Vérification du faisceau électrique pour prévenir tous dommages.	15.03.2022	KAD		
H	VERIFICATION SUPPORTS MOTEUR	DATE	NOM	VISA	CONTRÔLE
38	Vérification du bâti moteur, des silent-blocs pour dommage, criques, déformations, ainsi que fixations.	15.03.2022	KAD		
I	VERIFICATION DES FILTRES A AIR	DATE	NOM	VISA	CONTRÔLE



### Liste de tâches Protocol 50 FH-MDC 912 SERIES

Type A/C :	ULM - Moto du ciel	MSN	13007	Immatriculation	TU-LAB
N° Dossier	V50-LAB-002	Visite	50 FH	Operateur	TSA

Item n°	DESCRIPTION	PERSONNEL			
		DATE	NOM	VISA	CONTRÔLE
39	Inspection de l'état des filtres à air et nettoyage.	15.03.2022	KAD		
I	VERIFICATION DES CARBURATEURS	DATE	NOM	VISA	CONTRÔLE
40	Vérifier la synchronisation des carburateurs. (Synchronisation mécanique et pneumatique).	15.03.2022	KAD		
41	Vérifier la vitesse de ralenti.	15.03.2022	KAD		
42	Vérification mise à l'air libre des cuves de carburateurs, et état général.	15.03.2022	KAD		
43	Démonter et nettoyer les cuves de carburateur et le gicleur de ralenti.	15.03.2022	KAD		
44	Vérifier après démontage des filtres à air, pour nettoyage, le libre débattement normal des boisseaux de carburateur.	15.03.2022	KAD		
45	Vérifier le libre débattement des câbles de commande des carburateurs et leur état.	15.03.2022	KAD		
K	VERIFICATION DES MANGHONS DE CARBURATEURS	DATE	NOM	VISA	CONTRÔLE
46	Vérifier l'état général des manchons, et la présence de criques à l'intérieur de ceux-ci. Remplacer si nécessaire.	15.03.2022	KAD		
L	VERIFICATION DU REDUCTEUR	DATE	NOM	VISA	CONTRÔLE
47	Vérifier, en brassant l'hélice qu'il n'y a ni résistance, ni bruit suspect dans le réducteur.	15.03.2022	KAD		
M	ESSAI MOTEUR	DATE	NOM	VISA	CONTRÔLE
48	Démarrer le moteur et l'emmener à température de fonctionnement. Vérifier les allumages à 4 000 Trs/min et noter les régimes. A: 3 250 rpm B: 3 800 rpm	15.03.2022	KAD		
N	NETTOYAGE MOTEUR	DATE	NOM	VISA	CONTRÔLE
49	Nettoyage moteur	15.03.2022	KAD		
O	NIVEAU D'HUILE	DATE	NOM	VISA	CONTRÔLE
50	Avant de vérifier le niveau d'huile, brasser l'hélice sur 3 tours pour renvoyer dans le circuit l'huile accumulée dans le carter. Le niveau d'huile doit être compris entre le min et max	15.03.2022	KAD		
P	GENERAL	DATE	NOM	VISA	CONTRÔLE
51	Vérifier la validité des BS Rotax.	15.03.2022	KAD		



### Liste de tâches Protocol 50 FH-MDC 912 SERIES

Type A/C :	ULM -Moto du ciel	MSN	13007	Immatriculation	TU-LAB
N° Dossier	V50-LAB-002	Visite	50 FH	Operateur	TSA

Le contrôle des 50 Heures a été effectué conformément aux recommandations du constructeur, Maintenance Manual for Rotax Engine Type 912 Serie ; Manuel Utilisation et Entretien Ets Humbert Aviation, et inscrit dans les livrets d'aéronef et moteur.

Nom contrôleur	visa et cachet	Date (jour/mois/année/heure)	LIEU
KINDO		16.03.2022 à 10 H 20	KASUNYA



		Liste des travaux supplémentaires / Additional Work List Liste des travaux reportés / Deferred Item List Liste des pièces remplacées sur avion / Component Change list			
		Type A/C	ULM - Moto du ciel	MSN	13007
Workpackage Number	V50-LAB-002	Check	50 FH	Operator	TSA

Liste des travaux supplémentaires / Additional Work List

Item n°	Description	Action	Date	Name	Stamp	Control
1	Bouillon reducteur changer	/	/			/



Liste des pièces remplacées sur avion / Component Change List

Motif	Désignation	Position	PN Off	SN Off	PN On	SN On
camo	bouillon reducteur					

Liste des travaux reportés / Deferred Item List

Item n°	Description	Diff. Item Number	H.I.I. Deadline	Request		
Date	/	/	/	Cause :		
				Personnel <input type="checkbox"/>	Appro <input type="checkbox"/>	Tools <input type="checkbox"/>
				Temps <input type="checkbox"/>	Autres <input type="checkbox"/>	
				Part Number request or Comments		Work order n°
Item n°	Description	/	/	D.I.I. Item Number		
				H.I.I. Deadline	Request	
				Cause :	Appro <input type="checkbox"/>	Tools <input type="checkbox"/>
				Personnel <input type="checkbox"/>	Autres <input type="checkbox"/>	
Date	/	/	/			
				Part Number request or Comments	Work order n°	

TSA CAMO		TSA ATELIER ULM	
Date	16/03/22	Date	16.03.2022
Name	TOSOU LOUIS	Name	KINDO
Visa		Visa	

1. Autorité compétente / Pays Approving competent Authority / Country		2. CERTIFICAT D'APPROBATION POUR REMISE EN SERVICE AIRCRAFT CERTIFICATE OF RELEASE TO SERVICE										3. N° de repère du Formulaire Form Tracking Number	
Autorité Nationale de l'Aviation Civile de CÔTE D'IVOIRE ANAC-CI												WP /V50-LAB-002	
4. Nom et adresse de l'Organisme Agréé : Approved Organization Name and Address :		30 Rue Toussaint L'Ouverture Indénié-Plateau 26 BP 5160 ABIDJAN 26										5. Bon de commande / Contrat : / Facture : Work Order / Contract / Invoice : <b>013-22</b>	
6. Immatriculation Registration		7. N° de série Avion A/C Serial number		8. Type Avion A/C Model		9. Heures de vol Flight hours		10. Cycles / Vol total Cycles/ Flight total		11. N° de Série des Moteurs Engines serial number		12. N° de Série Groupe auxiliaire SN	
TU-LAB		13007		ULM		3540.2		9359		SN : 67-83366		NPU	
13. Utilisateur Operator		14. Programme d'Entretien approuvé / Approved Maintenance Schedule : Titre / Issue Revision / Amendment										15. Référence du Dossier de visite Work package Reference	
TSA		Programme d'entretien : 1 0										V50-LAB-001	
17. Travaux effectués / Work Performed : - Visite 50 FH effectuée conformément aux recommandations du constructeur, Maintenance Manual for Rotax Engine Type 912 Série et Manuel Utilisation et Entretien Els-Humbert Aviation, et inscrit dans les livres d'équipement et moteur.													
18. Remarques (Exceptions / Concessions / Other) ..... <b>N.A.</b> .....													
19. APRÈS selon le RACI 4145 Certifié que les travaux identifiés en case 17 et décrits en case 17, sauf spécifié autrement en case 18, ont été exécutés conformément au règlement RACI 4145 et qu'en regard de ces travaux l'Aéronef est prêt à être remis en service, et qu'il peut, par conséquent, être exploité en toute sécurité. Certifies that the work described in block 17 and described in block 17, unless otherwise specified in block 18 was accomplished in accordance with RACI 4145 and that under this work the aircraft is ready to return to service, and can therefore be operated safely.													
20. N° de certificat d'agrément : Certificate / Approval ref. N°		21. Nom / Nom		22. Visa et cachet / Visa and stamp		23. Date (jour/mois/année/heure) : Date (day/month/year/minutes) :		24. Lieu / Location		Sans Vol de Contrôle / Without test flight. <input checked="" type="checkbox"/> Avec Vol de Contrôle / With test flight. <input type="checkbox"/>			
010453ANACDSVSDNASEIN		KINDO				16.03.2022.10.00		KASUNYA					

	DONNEES TU-LAB	04 avr.-22
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### Fiche technique TU-LAB

CELLULE DE HUMBERT AVIATION				MOTEUR ROTAX					HELICE TRIPALE			
IMMATRICULATION	TYPE	S/N	TOTAL Temps utilisé	TYPE	S/N	TBO	TOTAL Temps utilisé	Temps restant	TYPE	S/N	TOTAL Temps utilisé	Temps restant
TU-LAB Année de Fabrication: Juillet 2007	Moto du ciel	13007	3542.4 fh	912 ULSFR	6783366	2000 hrs	504.4 fh	1495.6 fh	WARP DRIVE	Propeller: N20734	139.8 fh	1860.2 fh
			9372 Cyc							BLADE (S/N1: N20734-1) (S/N2: N20734-2) (S/N3: N20734-3)		


### Derniers entretiens

IMMATRICULATION	HEURE ACTUELLE AERONEF	VISITE	TEMPS RESTANT	VISITE EFFECTUEE		Prochaine visite
				HDV	DATE	HDV
TU LAB	3542.4 fh	50 Heures	113.8 fh	3540.2 fh	10 janv-22	3656.2 fh
		100 Heures	163.8 fh	3507.9 fh	18 févr-22	2706.2 fh
		200 Heures	63.8 fh	3406.2 fh	20 sept-21	2406.2 fh

APPENDIX 8: PILOT'S LOGBOOK

**SERVICE DE L'AERONEF - AIRCRAFT RECORD**


Dates Date	pilote pilot	Nombre membres d'équipage Number of Crew	Voyage / Journey		Heures / Times		Durée du vol Duration of Flight	A/C T.S.N.	Number of Flight S.N.	Engine TSN	
			DE	A	Départ Departure	Arrivée Arrival					
<b>Report Brought forward</b>											
14-fevr.-22	MVI	26	KASUNYA	KASUNYA	91,5	95,1	3,6	3497,7	22	456,1	
15-fevr.-22	MVI	27	KASUNYA	KASUNYA	95,1	97,8	2,7	3500,4	15	459,7	
16-fevr.-22	MVI	28	KASUNYA	KASUNYA	97,8	100,1	2,3	3502,7	13	462,4	
17-fevr.-22	MVI	29	KASUNYA	KASUNYA	100,1	102,4	2,3	3505	23	464,7	
18-fevr.-22	MVI	30	KASUNYA	KASUNYA	102,4	105,3	2,9	3507,9	18	467	
22-fevr.-22	MVI	31	KASUNYA	KASUNYA	105,3	108,1	2,8	3510,7	17	469,9	
22-fevr.-22	MVI	32	KASUNYA	KASUNYA	108,1	108,9	0,8	3511,5	1	472,7	
23-fevr.-22	MVI	33	KASUNYA	KASUNYA	108,9	110,9	2	3513,5	10	473,5	
24-fevr.-22	MVI	34	KASUNYA	KASUNYA	110,9	112,5	1,6	3515,1	10	475,5	
25-fevr.-22	MVI	35	KASUNYA	KASUNYA	112,5	114,7	2,2	3517,3	12	477,1	
2-mars-22	Yassin	36	KASUNYA	KASUNYA	114,7	117,8	3,1	3520,4	24	479,3	
3-mars-22	Yassin	37	KASUNYA	KASUNYA	117,8	120,5	2,7	3523,1	18	482,4	
4-mars-22	Yassin	38	KASUNYA	KASUNYA	120,5	121,9	1,4	3524,5	10	485,1	
5-mars-22	Yassin	39	KASUNYA	KASUNYA	121,9	123,9	2	3526,5	10	486,5	
5-mars-22	Yassin	40	KASUNYA	KASUNYA	123,9	124,9	1	3527,5	7	488,5	
6-mars-22	Yassin	41	KASUNYA	KASUNYA	124,9	126,3	1,4	3528,9	8	489,5	
7-mars-22	Yassin	42	KASUNYA	KASUNYA	126,3	126,7	0,4	3529,3	2	490,9	
7-mars-22	Yassin	43	KASUNYA	KASUNYA	126,7	128,9	2,2	3531,5	12	491,3	
11-mars-22	Yassin	44	KASUNYA	KASUNYA	128,9	131,6	2,7	3534,2	23	493,5	
14-mars-22	Maintenance	45	KASUNYA	KASUNYA	131,6	131,8	0	3534,2	0	496,2	
14-mars-22	Maintenance	46	KASUNYA	KASUNYA	131,8	132	0	3534,2	0	496,2	
15-mars-22	Yassin	47	KASUNYA	KASUNYA	132	134,4	2,4	3536,6	17	498,6	
16-mars-22	Yassin	48	KASUNYA	KASUNYA	134,4	137	2,6	3539,2	17	501,2	
16-mars-22	Yassin	49	KASUNYA	KASUNYA	137	138	1	3540,2	6	502,2	
		<b>Total</b>									



Depuis fabrication :  
Since manufacture:

Durée totale des vols : depuis dernier R.G.  
Total flying time since last major overhaul

SERVICE DE L'AÉRONAUTIQUE - AIRCRAFT RECORD

Dates Date	Détails vérifications et travaux effectués - Révisions particulières ou périodiques Modifications - Essais en vol Particulars of inspections and maintenance - Minor or major overhauls Modifications - Test flights	Cachet - Signature réparateur Organisme de contrôle Stamp and Signature of Overhauler and of controlling Authority
16.03.2022	L'ATE 5.0 HRS FAITE A 3548.2	

SERVICE DE L'AERONEF - AIRCRAFT RECORD

Dates Date	Pilote Pilot	Nombre membres d'équipage Number of Crew	Voyage Journey	Heures Times		Durée du vol Duration of Flight	Kilo- mètres parcourus Distance Down kilo- meters	Nombre de Passagers Number of Passengers	Nombre d'atterris- sages Number of Landings
				Départ Departure	Arrivée Arrival				
2022 17-03	Yeeok	9	KASUNYA KASUNYA	11:40	14:00	2.2			43

A reporter  
Carried forward

Depuis fabrication :  
Since manufacture :

Durée totale des vols : depuis dernière R.C.  
Total flying time since last major overhaul



