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Aircraft accident investigation bureau

Final Report No. 1910
by the Hellenic Republic
Ministry of
Transport & Communications
Air-Accident Investigation &
Aviation Safety Board (AAIASB)

concerning the accident

to the Piper PA-24-250 aircraft, HB-OVR

on 30 May 2004

Corfu State Airport, Hellenic Republic

ACCIDENT INVESTIGATION FINAL REPORT

05 / 2005

Accident to HB-OVR aircraft on 30-5-2004

At Corfu State Airport

The accident investigation was carried out by the Air-Accident Investigation and Aviation Safety Board, in accordance with:

- **ANNEX 13**
- **Hellenic Republic Law 2912/2001**
- **E.U. Directive 94/56**

The sole objective of the investigation is the prevention of similar accidents in the future.

The Accident Investigation and Aviation Safety Board

Chairman

Captain A. Tsolakis

Members

A. Katsifas

Supreme Court Judge ret.

G. Kassavetis

Captain

K. Alexopoulos

Mechanical & Electrical Engineer

G. Georgas

Hellenic Air Force Brigadier ret.
(Meteorologist)

Secretary: J. Papadopoulos

CONTENT

SYNOPSIS	1
1.FACTUAL INFORMATION	1
1.1 History of the flight.....	1
1.2 Injuries to persons	2
1.3 Damage to aircraft.....	2
1.4 Other Damage	2
1.5 Personnel Information.....	2
1.6 Aircraft Information	3
1.7 Meteorological Information.....	3
1.8 Navigational Aids	4
1.9 Communications.....	4
1.10 Airport Information	4
1.11 Flight Recorders.....	4
1.12 Wreckage and Impact Information	4
1.13 Medical and Pathological Information	4
1.14 Fire	4
1.15 Survival Aspects	4
1.16 Tests and Research.....	4
1.17 Organizational and Management Information	5
1.18 Additional Information	5
1.19 Useful or Effective Investigation Techniques.....	5
2. ANALYSIS	5
2.1 Landing Gear of the Aircraft	5
2.2 Removal of the Aircraft	7
3. CONCLUSIONS	7
3.1 Findings	7
3.2 Cause	8
4. SAFETY RECOMMENDATIONS.....	8

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OPERATOR	PRIVATE OWNER
OWNER	PRIVATE OWNER
MANUFACTURER	PIPER
TYPE	PA-24-250
NATIONALITY	SWISS
REGISTRATION	HB-OVR
PLACE OF THE ACCIDENT	CORFU STATE AIRPORT
DATE AND TIME	MAY THE 30TH, 2004, 16:14

**All time references are local time.
Local time=UTC+3.**

SYNOPSIS

On May the 30th, 2004, at 16:14, a private owned aircraft (a/c), originating from Switzerland, landed at Corfu State Airport with the landing gear retracted. The a/c contacted the runway with the belly, crawled approximately 260 m, and was finally immobilized within the runway. The a/c sustained minor damage without any injuries to the occupants. By the 864/30.7.2004 order of the AAIASB Chairman an Investigation Team was appointed, comprising Investigator Ioannis Papadopoulos as Investigator in Charge, Captain Elias Nikolaides, a/c Mechanics Demothenes Voudoures and Elias Koudounakos as members.

1. FACTUAL INFORMATION

1.1. History of the Flight

On May the 29th, 2004, at 11:20 the owner of the HB-OVR a/c and PPL holder, departed from Bex in Switzerland to Mykonos, on a recreation flight, with his parents as passengers.

At 11:35 landed in Sion for refueling and passport control, given that he was flying abroad. He departed from Sion at 12:31 and landed, due to adverse weather conditions in Italian air-space, at 14:45 in Propriano Corsica (France), where the occupants spent the night. At 12:45, next day (the 30th of May) departed to Corfu State Airport for refueling. Entered at TIGRA exit and entrance point to Athens FIR, at FL75. Following the published arrival procedure, for Corfu Airport, the a/c descended to 4 000 ft over OTHONI reporting point and next at 2 100 ft, at PALE.

According to Captain's statement, he lowered the landing gear, reaching 2 100 ft, in order to reduce the excessive speed of the a/c, due to descent.

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Two NM west of the aerodrome, at 1 000 ft, the Captain reported his position and the Air Traffic controller advised him to continue and pass over the aerodrome towards the left downwind leg for runway 17. Simultaneously passed him wind vector data, 5 kt from 120° and asked him which runway he was choosing for landing.

The Captain replied that he continues towards the left downwind leg for runway 17, but changed his mind shortly and asked the Controller if it was possible to use runway 35. The Controller accepted that and the a/c, turning left, entered the final approach for runway 35.

The a/c landed at 16:14, with the landing gear retracted, and touched the runway with the belly.

After crawling for approximately 260 m along the runway the a/c stopped 14 m to the right of the center-line. The Corfu Airport officers applied the emergency plan and then the removal plan to remove the immobilized a/c from the runway. The removal procedure was completed 13:30 h later. Two a/c that were about to land within the next half an hour, landed at Preveza airport.

The Captain isolated the electric system and lowered manually the landing gear, in order to prepare the a/c to be lifted out of the runway, by means of a crane and a fork-lift truck. After the a/c was put down, he activated the electric circuit master switch and the green light, indicating that the landing gear is down and locked, illuminated normally.

1.2. Injuries to persons

There were no injuries to occupants.

1.3. Damage to Aircraft

The following were detected by visual inspection of the a/c:

- Distortion of all the four blades of the propeller.
- Abrasions and detachment of the skin at the lower part of the fuselage.
- Distortion of the engine cowling.

1.4. Other Damage.

No other damage was observed.

1.5. Personnel Information

Captain : Male, 39 years old
License : Private Pilot License (No CH-39669)
Medical Certificate : Category 2, valid until September 9, 2005
Flying Experience : 341 h

His license was issued by the CAA of Switzerland; was issued for the first time on July 16, 1998, was valid until September 9, 2005 and it was recorded on it the rating for single piston engine airplane as well as the radiotelephony license.

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1.6. Aircraft Information

The Piper 24-250 Comanche is a low wing, completely metallic, single engine, four seated, light a/c. Bears a tri-cycled retractable landing gear. The control of the flight is performed by twin controls, via wire cables.

1.6.1. Airframe

Manufacturer	: Piper
Type	: 24-250
Serial Number	: 24-1595
Certificate of Registration	: registered in Switzerland, No 3/10-9-01
Airworthiness Certificate	: valid until November 25, 2005
1 000 h inspection	: on May 4, 2004, at 3 045.32 a/c flight hours
Total time (h) since new	: 3 054.39

1.6.2. Engine

Manufacturer	: Textron Lycoming Div.
Type	: LYC O-540-A1C5
Power	: 250 BHP

1.6.3. Propeller

Manufacturer	: TRW HARTZELL PROPELLERS
Type	: HC-C3YR-1 RF / Variable pitch

1.6.4. Maintenance

It seems that the maintenance of the a/c was carried out in accordance with the manufacturers' manuals, as it is implied from the check of the a/c logs.

1.6.5. Insurance

The a/c was insured at AXA company.

1.7 Meteorological Information

According to the METAR issued at 16:20 for LGKR : Wind was from 130°, 5 kt. Visibility \geq 10 Km. Clouds 3-4/8 Towering Cumulus with base at 2 500 ft, 5-7/8 with base at 18 000 ft. Temperature 20 ° C. Dew Point 14 ° C. QNH 1015 hPa.

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1.8 Navigational Aids

The flight was performed VFR and no navigational aids were used.

1.9 Communications

There was no communication problem between the a/c and ground stations, throughout the flight.

1.10 Airport Information

Corfu State Airport is international and has an asphalt runway, with dimensions 2373 X 45 m. Its orientation is 170° / 350 °. The Airport does not have in-house any means for a/c removal, since there is no such requirement.

According to the Removal Plan of the Airport, ground handlers and private companies have been appointed, under contract with the Airport, to provide the appropriate equipment for a/c removal.

1.11 Flight Recorders

HB-OVR does not have any flight data and cockpit voice recorder, since there is no such ICAO requirement.

1.12 Wreckage and Impact Information

The a/c crawled 260 m and was finally immobilized in the runway, 14 m to the right of the centre-line, at a distance of 945 m from the beginning of the runway.

1.13 Medical and Pathological Information

Not applicable.

1.14 Fire

Not applicable.

1.15 Survival Aspects

Not applicable.

1.16 Tests and Research

The a/c was lifted by means of lifting jacks, in order to detect any malfunction in the landing gear and retract and extend it, given that the Captain alleged that he had lowered the landing gear before landing. Due to the fact that, after landing, the Captain activated manually the landing gear(emergency procedure), and in order to bring the retraction-extension endless-screw at the proper position to restore its electrical operation, the electrical mechanism was activated and operated normally until the said restoration.

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Next, the landing gear lever was put in “UP” position. The system was activated, the gear retraction commenced, and half the way up, the electric circuit fuse popped “OUT”. The fuse was put “IN” and an attempt was made to lower the gear. The gear was extended normally. In a new attempt to retract the gear, before the light, indicating that the gear is up and locked, was illuminated, the fuse popped “OUT”, when the gear reached the upper position. The attempts were continued and always the gear was becoming down and locked, while, during retraction, the fuse was popping “OUT”, when reaching the upper position and before the illumination of the indicating lamp. In order to determine the cause of the popping “OUT” of the fuse, the seats and the access door were removed, to make possible the checking of the electrical and mechanical components, which possibly contributed to said malfunction. After the removal of the access door, in all checks the gear was extending and retracting normally and indicating lamps were illuminating. The electrical power, necessary for retracting and extending the gear, was measured during both functions and was found in accordance to the instructions of the manufacturer.

1.17 Organizational and Management Information

Not applicable.

1.18 Additional Information

Not applicable.

1.19 Useful or Effective Investigation Techniques

Not applicable.

2 ANALYSIS

2.1 Landing Gear of the Aircraft

Checks on the landing gear indicated that the gear was retracting and extending normally and the indicating lamps (yellow when the gear is up and locked – green when the gear is down and locked) were normally illuminating too.

The malfunction, which initially arose during the retraction of the gear, was due to stresses on the retraction mechanism, which were increasing the necessary force to retract. The stresses were stemming from the access door to the retraction mechanism of the a/c gear and developed after the impact of the fuselage on the runway.

After the removal of the access door and the subsequent relief of the stresses on the gear retraction mechanism, the system operated normally. Moreover, the aforementioned malfunction was taking place during gear retraction only. In a picture, shot by the occupants in flight during the leg Propriano-Corfu, the yellow lamp indicating the position of the gear appears illuminated, which implies that the legs were up and locked (picture 1).

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Picture 1

As soon as the gear is up, locked and the yellow indicating lamp is illuminated, the electrical power supply to the motor, that moves the landing gear, is interrupted.

This fact, in combination with the fact that there was no evidence of shortcircuit in the electrical circuit of the landing gear system, as well as with the fact that the green indicating lamp illuminated normally as the Captain set the electrical energy master switch in “ON” position, after having lowered the gear manually, verifies that a malfunction took place in the particular system during flight.

According to the design and manufacture of the a/c, as the pilot reduces the engine power, having flaps extended, while the landing gear is in “UP” position, an audio warning mechanism is activated, to urge the pilot lower the gear, if he intends to land. Also, the green indicating lamp is illuminated after the gear is down and locked.

The Captain stated that after he reduced the engine power, having the flaps extended and the landing gear in “UP” position, the audio warning mechanism was activated. However, its sound was scarcely audible, for he was using earphones (was audible in the cockpit but not in the earphones), hence he listened the sound when the horn was activated, but then the sound of the horn was covered by the noise of the a/c and he didn't notice if the horn stopped, when he lowered the gear later, to reduce the a/c speed. As it concerns the green indicating lamp, he thinks that it looked like illuminated. Moreover, he performed by heart the mandatory checks during approach and before landing, according to his statement, without using the check-list. Finally, he asserts that he noticed the landing gear lever in “down” position after landing.

The aforementioned allegations of the Captain were not confirmed, given that there was not identified any malfunction, justifying that the gear failed to extend; moreover, since he performed the checks for approach and landing by heart, it is then possible that:

- Although he thought to have lowered the gear to reduce the a/c speed, he didn't do it, perhaps due to distraction caused by rain.
- He was considering as a fact that he had lowered the gear, during the rest of the checks by heart.

2.2 Removal of the Aircraft

A private businessman was called, since the removal of the a/c was impossible, using the means available by the Airport ground handler, and the use of a crane was necessary.

The agreement between the Airport and the private businessman to offer his equipment, does not bind the businessman, neither with respect to his response time nor with respect to the availability of his equipment, since there is no fixed remuneration.

Therefore, although the reaction of the officers in charge in the Airport was immediate, the a/c was removed and the runway was given back to use 1:30 h after the accident. In the meanwhile, two a/c landed at Preveza as were advised to do so by the ATC; a third a/c remained airborne for a little time.

3. CONCLUSIONS

3.1 Findings

3.1.1 The a/c was registered in Switzerland, airworthy and insured.

3.1.2 The Captain held a valid PPL.

3.1.3 During the performed checks, no malfunction was detected on the mechanism for retracting and extending the landing gear of the a/c.

3.1.4 During the flight, the landing gear was up and locked and the warning horn was activated before landing, for the landing gear was not extended.

3.1.5 The malfunction, observed initially during the retraction of the gear was due to stresses developed on the mechanism after the impact on the runway and vanished after the removal of the component that caused it.

3.1.6 The Captain performed by heart all the checks during approach.

3.1.7 The rest of the allegations of the Captain were not verified.

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3.2 Cause

Omission to extend the landing gear, as well as to check that it was down and locked.

4. SAFETY RECOMMENDATIONS

4.1-2005-08 The mandatory checks throughout the several phases of the flight must be performed by check-lists and not by heart.

THE CHAIRMAN

Akrivos Tsolakis

True copy
THE SECRETARY

J. Papadopoulos

THE MEMBERS

K. Alexopoulos

G. Georgas

G. Kassavetis

A. Katsifas