

الهيئة العامة للطيران المدني  
GENERAL CIVIL AVIATION AUTHORITY



# Air Accident Investigation Sector

## Accident

### - Preliminary Report -

AAIS Case N°: AIFN/0013/2015

## Gyrocopter Loss of Control

Owner/Operator: Nad Al Sheba Private Club

Make and Model: AUTOGYRO MTOSport

Nationality and Registration: United Arab Emirates, A6-GY0,

Place of Occurrence: FAI WAG, Skydive Drop Zone, Palm Jumeirah, Dubai

State of Occurrence: The United Arab Emirates

Date of Occurrence: 9 December 2015



Air Accident Investigation Sector  
General Civil Aviation Authority  
The United Arab Emirates

## Accident Brief

Name of the Operator	:	Nad Al Sheba Private Club
Manufacturer	:	AUTOGYRO GMBH Germany
Aircraft model	:	MTOSport
Nationality	:	The United Arab Emirates
Registration	:	A6-GY0
State of Occurrence	:	The United Arab Emirates
Place	:	FAI WAG, Skydive Drop Zone, Palm Jumeirah, Dubai
Date and time	:	9 December 2015, 1424 LT
Injuries	:	Fatal injury to the Pilot

## Investigation Objective

This Investigation is performed pursuant to the United Arab Emirates (UAE) Federal Act No. 20 of 1991, promulgating the *Civil Aviation Law, Chapter VII- Aircraft Accidents, Article 48*. It is in compliance with *CAR Part VI Chapter 3*, in conformity with *Annex 13* to the *Convention on International Civil Aviation*, and in adherence to the *Air Accidents and Incidents Investigation Manual*.

The sole objective of this Investigation is to prevent aircraft accidents and incidents. It is not the purpose of this activity to apportion blame or liability.

## Investigation Process

The Air Accident Investigation Sector (AAIS) of the United Arab Emirates was informed about an Aircraft accident, involving a gyrocopter, which occurred during the Fédération Aéronautique Internationale (FAI) World Air Games (WAG), held at Skydive Dubai Palm Jumeirah. The Occurrence was notified to the AAIS Duty Investigator (DI) hotline, +971506414667.

The AAIS appointed an Investigator-in-charge with an Investigation Team (Team). Notifications were sent to Aircraft State of Manufacture and Design, Germany, but the State declined to assign an Accredited Representative to the Investigation. The Dutch Safety Board, being the State of the Pilot was also invited to take part in the investigation. Local notifications were sent to the GCAA and Nad Al Sheba Private Club. The AAIS will lead the investigation and issue the Final Report.

The information contained in this Preliminary Report is derived from the factual information gathered during the ongoing investigation into the Occurrence. Later Interim reports or the Final Report may contain altered information in case new evidence appears during the ongoing investigation that requires changes to the information depicted in this Report.



The AAIS Reports are made publicly available at:

<http://www.gcaa.gov.ae/en/epublication/pages/investigationReport.aspx>

Notes:

1. Whenever the following words are mentioned in this Report with first Capital letter, they shall mean the following:
  - (Accident)- this investigated accident;
  - (Aircraft)- the MTOsport gyrocopter involved in this Accident;
  - (Investigation)- the investigation into the circumstances of this Accident;
  - (Pilot) – the pilot involved in this Accident;
  - (Report)- this Accident Report.
2. Unless otherwise mentioned, all times in this Report are local time (Local time in UAE was UTC+ 4h);
3. Photos and figures used in this Report are taken from different sources and are adjusted from the original for the sole purpose to improve the clarity of the Report. Modifications to images used in this Report are limited to cropping, magnification, file compression, or enhancement of color, brightness, contrast, or addition of text boxes, arrows or lines.



## Abbreviations

<b>AAIS</b>	The Air Accident Investigation Sector of the United Arab Emirates
<b>BCAR</b>	British Civil Airworthiness Requirements
<b>CAR</b>	Civil Aviation Regulations
<b>CPR</b>	Cardiopulmonary resuscitation
<b>DULV</b>	Deutscher Ultraleichtflugverband e.V.
<b>EAF</b>	Emirates Aerosports Federation
<b>FAI</b>	Fédération Aéronautique Internationale
<b>ft</b>	feet
<b>GCAA</b>	The General Civil Aviation Authority of the United Arab Emirates
<b>LT</b>	UAE local time
<b>MLH</b>	Micro Light Helicopter
<b>NFL</b>	Nachrichten für Luftfahrer”
<b>POH</b>	Pilot Operating Handbook
<b>UAE</b>	The United Arab Emirates
<b>UTC</b>	Coordinated Universal Time
<b>WAG</b>	World Air Games



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# 1. Factual Information

## 1.1 The Occurrence

On 9 December 2015, the Aircraft, a MTOsport gyrocopter, flown by a Dutch citizen during the Fédération Aéronautique Internationale (FAI) World Air Games (WAG), lost lift and height and impacted the sea upon passing the final pylon. The Pilot was submerged in the water for a period of approximately ten minutes before being rescued in an unconscious condition by safety and rescue divers. The pilot did not regain consciousness and succumbed to his injuries ten days after the accident.

The gyrocopter, known as an AutoGyro MTO was owned by *Nad Al Sheba Private Club*, was being flown in the Autogyro pylon race competition The Autogyro air race was cancelled after the accident.

The race was held at the Skydive drop zone facility, located at Palm Jumeirah Dubai and Skydive Desert Campus. The air race was arranged to take place over the water and the area was marked with eight floating pylons. The event was scheduled to take place over four days, starting on 4 December and ending on 9 December 2015.

Figures 1 and 2 show the pylon locations, A to H, the strip used for takeoff and landing, along with the race pattern. During the air race each competitor had to complete the pylon circuit followed by a climb to 1000 feet (ft) before switching off the engine and then landing in a predetermined confined area. Each pilots' final placing in the race was based on the time it took to complete the course and by adding any penalties, in the form of time, due to not following the rules.

As stated by the gyrocopter event director<sup>1</sup>, 9 December 2015, was the 6<sup>th</sup> time that the competitors had flown the competition pylon race course. This included two practice and two competition days held at Skydive Desert Campus over the undulating desert terrain.

Practice days at Skydive Desert Campus consisted of:

1. 1 December 2015 flying the practice race course from pylons A to H
2. 2 December 2015 the race course was flown in reverse from pylons H to A.

The competition air race consisted of the following:

1. 4 December 2015 at Skydive Desert Campus flying from pylons H to A
2. 5 December 2015 at Skydive Desert Campus flying from pylons H to A
3. 6 December 2015 at Skydive Palm Jumeirah flying from pylons A to H over water
4. 9 December 2015 at Skydive Palm Jumeirah flying from pylons A to H over water

It was reported that the Pilot who was involved in the accident performed satisfactorily and at the end of the third day of the competition he was in 11<sup>th</sup> position out of 21 competitors. The event director noted that the previous flights by the Pilot throughout the competition had not drawn any attention in either a positive or negative way.

<sup>1</sup> During the WAG the FAI assigns an event director for each category of air race to supervise the competition.



Figure 1. Autogyro race course

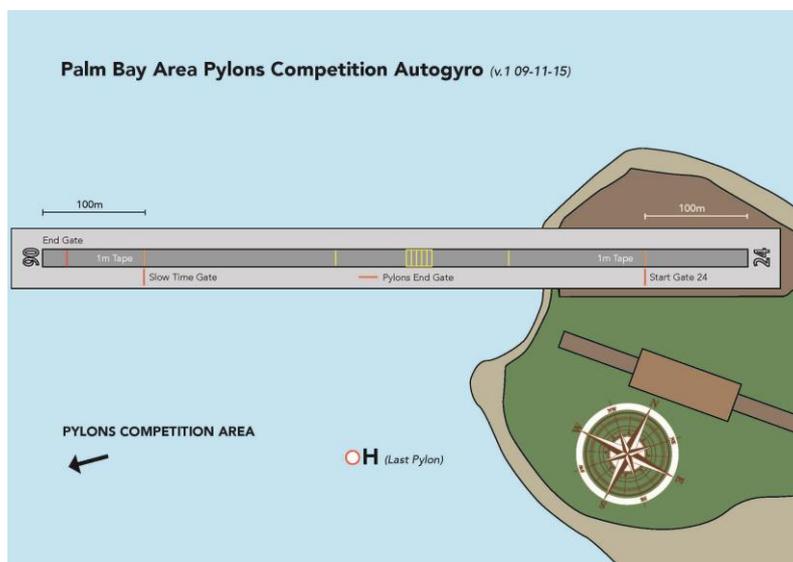


Figure 2. Runway 24

### 1.1.1 The Accident flight

In preparation for the flight, the Pilot wore normal clothing, except for a life jacket and a helmet. He appeared to be composed and prepared for the flight. The grey MTO Sport (A6-GY0) was refuelled and before engine start the Pilot tested his helmet intercom. It is not confirmed whether the Pilots' helmet straps were fastened for the flight.

After receiving clearance from the airfield judge, he taxied the Aircraft to the runway 24 holding point for take-off.

The following description is based on video footage from a media camera and the Pilot's GoPro body camera:

1. Time 0 - Airborne at approximately 14:23:43 LT.
2. The Pilot flew the pylon race course making 3 left hand turns without any problem at pylons A, C and E.
3. From pylon F to G the Aircraft is in a right hand turn which then reverses to a left hand turn.
4. Time 96 secs (GoPro 5:52) - The aircraft is in a 30 degree coordinated left turn with a speed of 165 km/h at an altitude of 150 feet.
5. Time 97 secs – The Aircraft is at 45 degrees with left pedal input and speed of 151 km/h.
6. Time 98 secs - The Pilot makes a control stick input to roll out. It appears that the roll is more severe than is to be expected from the control stick input.
7. Time 99 secs (GoPro 5:55) – Severe flexing of the windscreen is noted as the wind comes from the right. Altitude starts to increase towards 200 feet. The Pilot then pushes the control stick to the left.
8. Time 100 (Figure 3) - The helmet is seen coming off the Pilot's head and simultaneously his left hand leaves the throttle. The Aircraft enters a roll and the stick is moved full left forward to stop the roll. Another photo shows that the helmet cord is attached to the aircraft at the left thigh and trails around the right side of the pilot's neck to the left side of the aircraft, where the helmet is pulled backwards by the wind.
9. Time 101 secs (Figure 4) – The Aircraft is nose high. The pilots left hand momentarily returns to the throttle. The control stick is full forward and it appears that the Gyrocopter goes into zero or negative G, with the Rotor RPM at approximately 400.
10. Time 103 secs (Figure 5) - The Aircraft rolls to the right at almost 90 degrees after reaching 250 feet altitude. The Pilot pulls the control stick back and to the left. Airspeed is indicating near zero and the



Figure 4. The Aircraft climbs to 250ft



Figure 5. Aircraft starts to invert



Figure 6. Aircraft impacts the water

rotor RPM was dropping rapidly.

11. Time 105 secs (GoPro 06:01) (Figure 6) – The Aircraft impacts the water at approximately 90km/h in a nose down attitude.
12. Time 109 secs (Figure 7) - The Aircraft rolls onto its back and submerges six secs after the impact. The Pilot is not seen until he is recovered by the Dubai Police Search and Rescue team.

## 1.2 Injuries to Persons

The search and rescue team of divers recovered the Pilot from a depth of about 20 feet below the surface. The Pilot sustained serious injury, with a broken jaw, and was unconscious when taken from under the sea. It is estimated that the pilot was submerged in the water for approximately ten minutes.



The Pilot did not regain consciousness and succumbed to his injuries ten days after the accident.

## 1.3 Damage to Aircraft

There was extensive damage to the Aircraft. The majority of the glass fibre monocoque at the front of the Aircraft was damaged and a large area was absent.

The instrument panel was still loosely attached to the Aircraft by numerous cables and tubes.

The nose wheel had departed and the push rods attached to the pedals had broken.

The rudder cables were in good condition, whilst the controls rods were bent and distorted due to the impact.

The main cyclic control and all its associated control rods were bent and distorted in certain places due to the impact, but the cyclic control was still intact.

The main fuel tanks were ruptured and contaminated with sea water. A fuel sample was therefore not obtainable.

The exterior of the Rotax engine and the propeller showed no signs of damage. One rotor blade had sheared off and the other was bent and distorted.

## 1.4 Other Damage

There was no report of damage to any other ground equipment, nor the environment.

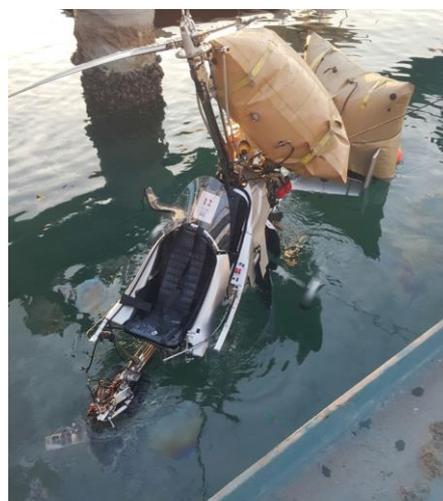


Figure 8. Gyrocopter lifted from the sea.



## 1.5 Personnel Information

The 49-year-old Pilot held a valid flight crew licence for Micro Light Helicopter (MLH)-gyroplanes issued by the Civil Aviation Authority of the Netherlands including a valid Class 2 medical certificate. He was also a glider pilot.

His log book records for gyrocopter flying indicated that he had a total of 52:38 flight hours, which consisted of 31:20 dual hours and 21:18 solo hours.

## 1.6 Aircraft Information

### 1.6.1 General data

The Aircraft was built by AutoGyro GMBH in Germany and was assembled at Nad al Sheba Private Club. On 30 November 2015, the Aircraft was registered with the UAE GCAA and a permit to fly was issued by Nad Al Sheba Private Club. Prior to 30 November 2015, the Aircraft had zero flight hours.

Seating capacity is two persons with a maximum takeoff weight of 500kgs. It is equipped with an 115hp turbo charged Rotax engine.



Figure 9. MTOSport Gyrocopter

Table 1. Aircraft data

Aircraft Type	AUTOGYRO MTOSport
Aircraft Manufacturer	AUTOGYRO GMBH, Germany
Aircraft MSN	M01230
Aircraft Registration / Date	A6-GY0 / 30 November 2015
Owner	Nad al Sheba Private Club
Operator	Nad al Sheba Private Club
TSN Hrs	18.16 Hrs
Aircraft Certificates	Issued with a Permit to Fly by Nad Al Sheba Private Club
Engine Data	Rotax 914UL

### 1.6.2 Aircraft Certification

As stated in the Aircraft Pilot Operating Handbook (POH)<sup>2</sup>

The MTOSport is designed, tested and certified according to the German design specifications for microlight gyroplanes (“Bauvorschriften für Ultraleichte Tragschrauber”, BUT 2001) including its latest amendment published in “Nachrichten für

<sup>2</sup> AutoGyro\_POH\_MTOSport Revision 6.0 – Issue Date 16.06.2014



Luftfahrer" NFL II 13/09 issued 12.02.2009, as well as the British Civil Airworthiness Requirements (BCAR) Section T. The corresponding certification documents (Geräte-Kennblatt) have been issued by the responsible Germany department DULV (Deutscher Ultraleichtflugverband e.V.), respectively the German national certifying authority. The noise certificate was granted according to the German requirements for noise protection for microlight gyroplanes ("Lärmschutzverordnung für Ultraleichte Tragschrauber").

### 1.6.3 Aircraft Limitations

The POH informs the pilots that "abrupt manoeuvres or flight in heavy turbulence must be avoided as this could lead to rotor speed variations associated with high stress, possible damage to the aircraft, or uncontrollable attitudes".

Several warnings, boxed in red colour, and limitations are mentioned in the POH pertaining to operating procedures. A "WARNING means that the neglect of the appropriate procedure or condition could result in personal injury or loss of life".

- a. "General" the following WARNINGS are mentioned:
  1. The operation of a gyroplane demands professional pilot instruction and dedicated training on gyroplanes. Without a valid license the gyroplane must not be operated.
  2. During the entire flight adequate rotor loading must be maintained. Do not perform any manoeuvres resulting in the sensation of feeling light or near weightless.
- b. "Kinds of Operation" the following WARNINGS are mentioned:
  1. Any manoeuvre resulting in a low-G (near weightless) condition can result in a catastrophic loss of lateral/roll control in conjunction with rapid main rotor RPM decrease. Always maintain adequate load on the rotor and avoid aggressive forward control input performed from level flight or following a pull-up.
  2. Excessive side-slip is prohibited! Side slip may be performed only with proper training and within safe boundaries. Use gentle pedal input for initiation and stabilization. Do not rely on airspeed indication in side slip. Never perform abrupt control stick input into the direction of motion. Be aware that excessive side slip may result in an uncontrollable and unrecoverable (low-G) attitude.

### 1.7 Meteorological Information

The prevailing weather conditions at the time of the Accident flight:

Temperature-	24 °C
Cloud condition-	Clear sky, with few passing clouds,
Wind speed-	9km/h from the South East
Visibility-	> 10km
Humidity-	27%
QNH-	1019 mbar



## 1.8 Aids to Navigation

Not a factor in this Occurrence.

## 1.9 Communications

Not a factor in this Occurrence.

## 1.10 Aerodrome Information

The runway at Skydive Palm Jumeirah was used for the final two days of the Autogyro air race competition. Runway 24 was the departure runway for the Occurrence flight. Floatable pylons were placed at set coordinates adjacent to the runway to form the race course. (Figures 1 and 2).

## 1.11 Flight Recorders

The Aircraft was not equipped, nor was it required to have, any electronic recording devices.

The Pilot and the Aircraft had GoPro cameras fitted. In addition, video footage of the accident flight was retrieved from the WAG organizers. The video recorded by the Pilot's GoPro was of good quality. The video recorded by the Aircraft GoPro was not readable as the camera case opened during the impact which affected the recorded data.

## 1.12 Wreckage and Impact Information

The Aircraft was severely damaged as a result of the impact with the sea.

## 1.13 Medical and Pathological Information

No abnormal blood test results were reported to the Investigation Team.

## 1.14 Fire

There was no post impact fire.

## 1.15 Survival Aspects

The Pilot was wearing a helmet and a life jacket prior to departure, and was strapped to the front seat of the Aircraft with shoulder and lap seat belts. Six seconds before the impact, the Pilot's helmet was seen coming off his head but it remained attached to the Aircraft by its electrical cord until impact.

Even though the front of the Aircraft was severely damaged upon impact with the water, there was no adverse effect to the Pilot's seat or seat belt harness.

The Aircraft sank six seconds after the impact with the sea surface. It is not certain what immediate effect the impact with the water had on the Pilot and when he lost consciousness. There was no



Figure 10. Diver in the water



Figure 11. The Pilot was recovered after 10 minutes



deployment of his life jacket.

The Search and Rescue Team arrived at the Accident location within 40 seconds and the first diver (Figure 10) was in the water 72 secs after the impact. The Pilot was recovered after 10 minutes (Figure 11) and cardiopulmonary resuscitation (CPR) was applied approximately two minutes after he was placed in the rescue boat.

### **1.16 Tests and Researches**

Will be discussed in the Final Report.

### **1.17 Organizational and Management Information**

#### **1.17.1 A brief about FAI**

The FAI, the World Air Sports Federation, is the world governing body for air sports, and for certifying world aviation and space records. The FAI was founded in 1905 and is a non-governmental and non-profitmaking organisation. FAI activities include balloons and airships, power flying, gliding, helicopter flight, parachuting, aeromodelling, aerobatics, hang gliding, microlight paramotor flying, amateur building of aircraft, manpowered flying, paragliding and all other aeronautic and astronautic sporting activities.

#### **1.17.2 The FAI and WAG**

The 2015 WAG held at Dubai, UAE, were conducted under the rules of the FAI and was the premier international multi-discipline air sports event fielding FAI pre-selected air sports athletes. This multi-discipline event was awarded to and organised by the Emirates Aerosports Federation (EAF).

The WAG took place from 1 to 12 December 2015 where 875 competitors from 55 countries competed in the games and consisted of competitions in the following categories: aerobatics, aeromodelling, air race & general aviation, ballooning, gliding, hang gliding, microlight-gyrocopter/autogyro, parachuting and paragliding. Previous WAG were held at Turkey (1997), Spain (2001) and Italy (2009).

### **1.18 Additional Information**

Will be discussed in the Final Report.

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

Will be discussed in the Final Report.

## **2. On-going Investigation**

As the Investigation is on-going, additional information will be provided in the Final Report.

**This Report is issued by:  
Air Accident Investigation Sector  
General Civil Aviation Authority  
The United Arab Emirates**