

الهيئة العامة للطيران المدني  
GENERAL CIVIL AVIATION AUTHORITY



# Air Accident Investigation Sector

## Accident

### - Summary Report -

AAIS Case N° AIFN/0013/2024

## Aeroprakt

### Loss of Control (In-Flight)

Operator:	Al Jazirah Aviation Club
Make and Model:	A32 Vixxen, Aeroprakt
Nationality and Registration:	United Arab Emirates, A6-SKY
Place of Occurrence:	Al Wayayah, Umm Al Quwain
State of Occurrence:	The United Arab Emirates
Date of Occurrence:	2 November 2024



This Investigation is conducted 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 the *Air Accident and Incident Investigation Regulation (AAIR)*, and in conformity with *Annex 13* to the Convention on International Civil Aviation.

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.

The Air Accident Investigation Sector issued this Summary Report in accordance with national and international standards and best practices. Consultation with applicable stakeholders, and consideration of their comments, took place prior to the publication of this Report.

The Summary Report is publicly available at:

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

**Air Accident Investigation Sector  
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## Investigation Process

The occurrence involved a privately-owned Aeroprakt A-32 Vixxen aircraft, registration marks A6-SKY, which was conducting a recreational flight under visual flight rules (VFR).

The aircraft departed from Al Jazirah Aviation Club at 06:18 local time, heading to Emirates Falcons Aviation, with a pilot and a passenger onboard.

About 12 minutes after takeoff, the passenger contacted Al Jazirah Aviation Club to report that the aircraft had crashed. Both occupants were transported to the hospital. The pilot sustained serious injuries, whereas the passenger suffered minor injuries. No emergency distress call was made during the flight. The weather conditions at the time were reported to be normal.

The Air Accident Investigation Sector (AAIS) Duty Investigator was notified of the occurrence via the hotline at +971 50 641 4667.

Following the initial on-site investigation and the Classification, Decision-making, and Scoping session; the occurrence was classified as an "Accident" based on the total loss of the aircraft and the severity of the pilot's injury. This investigation is focused on the events leading up to the occurrence, without an in-depth analysis of non-contributing factors.

### Notes:

- Whenever the following words are mentioned in this Report with a first letter **Capitalized**, they shall mean the following:
  - (Accident) – this investigated accident
  - (Aircraft) – Aeroprakt A-32 Vixxen involved in the accident
  - (Club) – Al Jazirah Aviation Club
  - (Investigation) – the investigation into this accident
  - (Pilot) – the pilot in command of the aircraft
  - (Report) – this accident investigation Summary Report.

- Unless otherwise mentioned, all times in the Report are the United Arab Emirates local time (LT = UTC plus 4 hours).
- The structure of this Summary Report is an adaptation of the Annex 13 Final Report format.

## Factual Information

### History of the Flight

On the morning of 2 November 2024, a privately owned Aeroprakt A-32 Vixxen light sport Aircraft (LSA), registration marks A6-SKY, departed from Al Jazirah Aviation Club, Ras Al Khaimah, for a recreational flight to Emirates Falcons Aviation, Al Ain, United Arab Emirates. The flight was conducted under visual flight rules (VFR) with two persons onboard: The Pilot and one Passenger.

Prior to departure, the Pilot conducted routine 360 pre-flight inspection<sup>1</sup> and ground engine runs, during which all Aircraft systems were confirmed to be functioning normally.

As Al Jazirah Airport (OMRJ) did not provide weather information services, the Pilot reviewed the METAR<sup>2</sup> for Ras Al Khaimah International Airport (OMRK). Additionally, the Pilot established two-way communication with another Aeroprakt A-32 Vixxen aircraft, registration marks A6-HPY, which was scheduled to follow the same route.

At 0618, the Aircraft lined up on runway 10. The takeoff was smooth, with all systems operating within normal parameters, as confirmed by the Pilot and the extracted data from the GPS display.

As OMRJ is located within uncontrolled airspace, the Pilot broadcasted his intentions prior to takeoff. Shortly after departure, the Aircraft transitioned from Al Jazirah ground broadcast zone to the Mandatory Broadcast Zone (MBZ) North airspace. The autopilot was then engaged, and the Pilot captured video footage of a hot air balloon positioned to the Aircraft's right.

While the Pilot was photographing the hot air balloon at a recorded altitude of 1,400 feet the windshield exploded, causing significant disruption to the Aircraft's aerodynamics. At the time, the wind speed was 6 knots, and the ground speed was 102 knots. The resulting high-speed airflow propelled

<sup>1</sup> 360° preflight inspection refers to a systematic walk-around of the aircraft, where the pilot visually and physically inspects all major components—propeller, wings, control surfaces, fuselage, landing gear, and empennage—to ensure the aircraft is airworthy and safe for operation.

<sup>2</sup> METAR: OMRK 020200Z 19002KT CAVOK 22/17 Q1015 A2999

debris into the cockpit, injuring both the Pilot and the Passenger. The windshield on the Passenger's side detached completely, while the remaining portion on the Pilot's side repeatedly struck the Pilot's face, further impairing visibility and causing additional facial injuries

Following the windshield explosion, the resulting cabin airspeed imbalance created internal turbulence, which caused both cabin doors to open during flight. Despite sustaining facial injuries and experiencing reduced visibility, the Pilot retained control of the Aircraft and proceeded to assess the extent of the damage. The Pilot initiated a search for a suitable emergency landing area within the surrounding desert environment, which was characterized by dunes and limited flat terrain.

The Pilot aimed to land on a small farm with a flat area. He disengaged the autopilot and manually attempted to control the descent. With full power applied, the Aircraft still struggled to maintain stability. The Pilot maneuvered in a spiraling descent, attempting to reach the ground as safely as possible (figure 1).

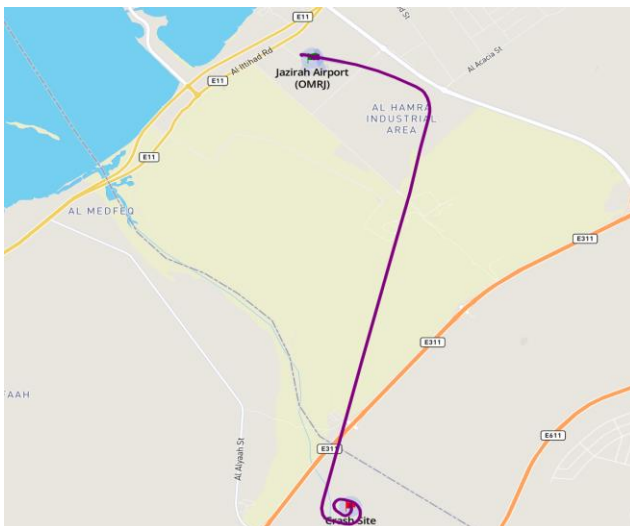


Figure 1. Flight path of the Aircraft

Upon impact, the Passenger was able to evacuate the Aircraft unassisted. The Pilot, however, remained trapped in the damaged cockpit, with his leg pinned beneath debris. A nearby farmer arrived at the scene and assisted the Passenger in providing aid to the injured Pilot, as fuel was observed leaking. During this time, aircraft A6-HPY, which had been trailing A6-SKY, lost both visual and radio contact with the Accident Aircraft.

The Passenger used the Pilot's phone to call emergency services, as his own device was damaged

during the crash. He also notified the Club and shared their location for assistance.

Due to the sandy terrain, ambulances and police vehicles encountered challenges in reaching the crash site. However, the police vehicle was able to navigate the area and request an airlift ambulance to provide rapid medical assistance.

Both the Pilot and the Passenger were transported to Sheikh Khalifa Hospital, Umm Al Quwain, for medical treatment.

## Damage to the Aircraft and Property

The Aircraft suffered substantial damage because of ground impact forces. The cockpit, propeller blades, engine bay, and nose gear were significantly damaged (figure 2).

There was no damage to property or environment.



Figure 2. Aircraft damage

## Personnel Information

The general data of the Pilot are shown in table 1.

Table 1. Pilot data	
Age	46
Type of license	LSA
Valid to	25 October 2024
Rating	LSA
Total hours on all type	395.05



Total hours of command on all type	358.55
Total hours on this type	361.45
Total hours of command on this type	339.55
Total hours last 7 days on this type	2.40
Last recurrent training	17 September 2024
Medical class, validity	LSA, 20 Sept. 2025
Medical limitation	NIL

The Pilot was the owner of the Aircraft since 26 May 2021, and was practicing recreational flying frequently.

## Injuries to Persons

The Pilot sustained severe injuries, including a broken nose, rib fractures, a fracture in the right leg, and multiple lacerations requiring sutures.

The Passenger sustained injuries, which included facial lacerations and a hand fracture.

## Aircraft Information

### General information

The Aircraft was Aeroprakt A-32 light sport. It was a two-seat, high-wing, strut-braced monoplane of conventional aerodynamic layout, equipped with a fully enclosed cockpit, non-retractable tricycle landing gear, and a steerable nose wheel.

The A-32 is powered by a Rotax 912 engine and a three-blade, ground-adjustable pitch propeller<sup>3</sup>. The Aircraft was certified under the LSA category and was approved for operations conducted under VFR.

The Aircraft was constructed using lightweight materials and was designed for stable flight characteristics. It was fitted with an integrated avionics suite that includes an autopilot and navigation system to support basic flight management functions such as route tracking.

Table 2 illustrates the Aircraft general data.

Table 2. Aircraft data	
Aircraft	
Manufacture	Aeroprakt

Model	A32 Vixxen
MSN	009
Year of manufacture	2016
Nationality and registration marks	United Arab Emirates, A6-SKY
Name of the owner	Private
Name of the operator	Al Jazirah Aviation Club
<b>Certificate of registration</b>	
Certificate No.	UAE-COR-1217
Issuing authority	General Civil Aviation Authority
Issuance date	26 May 2021
<b>Operational data</b>	
Time since new (hours)	358.55
Maximum take-off weight (kg)	600
Power	100 HP / 73,5 kW at 5800 RPM
$V_{NE}$ never exceed speed	240 km/h
$V_A$ max. manoeuvring speed	180 km/h
$V_{FE}$ max. flap extended speed	135 km/h
$V_{S1}$ stall speed, flaps retracted	60 km/h
$V_{S0}$ stall speed full flaps	55 km/h
Cruise speed at 4,650 RPM	175 km/h
Max. horizontal speed	215 km/h
Crosswind limit	7 m/s
Max. load factors	+4/-2
Last inspection check, type, date and hours/cycles	100-hour/annual inspection, 09 October 2024, 344.30
Time operated since last major inspection (hours)	14.25
Fuel tank capacity (ltr)	95
Take-off weight (kg) (on the Accident flight)	580
Fuel tank capacity (ltr)	83

<sup>3</sup> A ground-adjustable pitch propeller allows the blade angle to be manually set while the aircraft is on the ground, prior to flight. Unlike constant-speed or in-flight adjustable propellers, its pitch cannot be changed during flight. This type of propeller offers a

balance between performance and simplicity, commonly used in Light Sport Aircraft due to its lower weight and maintenance requirements.

(On the Accident flight)	
<b>Engine</b>	
Manufacture	Rotax Aircraft Engines
Model	Rotax 912 ULS
MSN	6784480
Date of installed	22 Feb 2016
Engine hours (TSN)	358.55

Figure 3 illustrates a similar aircraft.



Figure 3. Aeroprakt A-32

#### Aircraft Avionics System<sup>4</sup>

The Aircraft was equipped with a Dynon SkyView integrated avionics system (figure 4). The system includes a primary flight display (PFD), an engine monitoring system (EMS), and a moving map navigation display. The configuration of these components can be customized to support various operational requirements.

##### Integrated avionics system

The Dynon SkyView avionics system integrates autopilot functionality with a comprehensive navigation suite, utilizing a modular architecture to support system reliability and operational adaptability. Key features include synthetic vision, vertical navigation (VNAV), and the capability to receive real-time traffic and weather information via ADS-B connectivity. The interface allows for pilot interaction through a combination of touch input, physical controls, and structured menu navigation.

##### Autopilot and navigation

The autopilot system is operated through the SV-AP-PANEL<sup>5</sup>, which provides dedicated controls for flight



Figure 4. Dynon SkyView Avionics System

director activation, coupled approach procedures, and emergency level flight recovery. The system's integration with GPS enhances navigational accuracy, enabling precise aircraft positioning, route planning, and detailed map display. Additional functions include the creation of user-defined waypoints and support for VFR operations. Instrument flight rules (IFR) capabilities may be available depending on the specific installation configuration.

##### Hardware and modular design

The core components of the system are the SkyView HDX 7-inch displays (model SV-HDX800), which are equipped with capacitive multi-touch interfaces and high-intensity light emitting diode (LED) backlighting to maintain screen visibility under varying lighting conditions. System continuity during power interruptions is supported by the SV-BAT-320 backup battery, which provides an independent power source to maintain critical display functionality.

##### Enhanced operational efficiency

The system enhances operational efficiency through integrated alerting functions, detailed data logging capabilities, and configurable display settings. Engine

controls for autopilot engagement and flight mode selection, enhancing in-flight usability and reducing pilot workload, especially in Light Sport and experimental aircraft.

<sup>4</sup> SkyView HDX Pilot's User Guide – Revision D, Dynon Avionics, June 2019, [https://www.dynonavionics.com/includes/guides/SkyView\\_HDX\\_Pilots\\_User\\_Guide-Rev\\_D\\_v15\\_4.pdf](https://www.dynonavionics.com/includes/guides/SkyView_HDX_Pilots_User_Guide-Rev_D_v15_4.pdf)

<sup>5</sup> The SV-AP-PANEL is Dynon Avionics' dedicated autopilot control interface for the SkyView system. It provides physical



parameters are monitored via the SV-EMS-220/221<sup>6</sup> modules, which provide real-time data on engine performance.

In the Accident, data was extracted from the Aircraft's systems for detailed analysis. The recorded parameters included engine performance, revolutions per minute (RPM), angle of attack (AoA), wind speed, and altitude bug, among others. Additional data captured included metrics such as ground speed, airspeed, course, and course deviation indicator (CDI) information, alongside glideslope deviation and autopilot parameters.

### Autopilot system<sup>7</sup>

The autopilot uses Dynon Avionics servos (SV32, SV42, and SV52)<sup>8</sup> to automate Aircraft navigation and stabilization. It can operate in both simplified and expert modes, providing flexibility for VFR and IFR pilots. Simplified controls offer basic functionality for ease of use, while expert controls support advanced features like vertical navigation (VNAV), flight director modes, and coupled approaches.

The system can be managed via the SkyView display interface or an optional SV-AP-PANEL, which provides dedicated physical controls (figure 5). The panel includes buttons for engaging various autopilot modes such as VNAV, IAS hold, and a dedicated LEVEL button for emergency straight-and-level recovery. Autopilot status and active modes are displayed on the SkyView top bar.



Figure 5. Autopilot display system

### Level Mode

The Level Mode (Straight and Level Mode) quickly stabilizes the Aircraft by setting the roll angle and vertical speed to zero. This mode is especially useful in emergencies, where it ensures the Aircraft achieves and maintains level flight. Activation occurs via the LEVEL button on the control panel or through the display interface.

### Activation and disengagement

- **Activation:** To engage the autopilot, pilots press the AP (autopilot) button, either on the SkyView display or an optional control panel. Upon activation, the autopilot defaults to roll hold and vertical speed (VS) hold modes. Roll hold maintains the Aircraft's current lateral attitude, while VS hold stabilizes the Aircraft's vertical trajectory based on its existing climb or descent rate. These initial modes ensure immediate stability and control as the autopilot assumes responsibility for the Aircraft. Pilots can then select additional modes, such as heading or altitude hold, to refine the autopilot's operation further.
- **Disengagement:** The autopilot can be turned off by pressing the OFF button, toggling the AP button, or activating the disconnect switch—

<sup>6</sup> The SV-EMS-220 and SV-EMS-221 are engine monitoring modules from Dynon Avionics, used with the SkyView system. The SV-EMS-220 supports a wide range of engines by collecting data from analog and digital sensors, while the SV-EMS-221 is designed specifically for Rotax 912 is and 915 is engines, receiving data directly from the engine's ECU via CAN bus. Both modules provide real-time engine parameter display and customizable alerts to enhance flight safety.

<sup>7</sup> SkyView HDX Pilot's User Guide – Revision D, Dynon Avionics, June 2019, [https://www.dynonavionics.com/includes/guides/SkyView\\_HDX\\_Pilots\\_User\\_Guide-Rev\\_D\\_v15\\_4.pdf](https://www.dynonavionics.com/includes/guides/SkyView_HDX_Pilots_User_Guide-Rev_D_v15_4.pdf)

<sup>8</sup> The SV32, SV42, and SV52 are autopilot servos by Dynon Avionics, designed for integration with SkyView and D10/D100 Series EFIS systems. These servos offer automation of aircraft control surfaces with specific torque outputs to suit various aircraft sizes: SV32 provides 36 in-lb, SV42 delivers 55 in-lb, and SV52 offers 72 in-lb. Each servo is equipped with mounting options (standard arm, long arm, or capstan drive) to fit different aircraft configurations.



commonly located on the control yoke or stick for ease of access. Additionally, manual override is always available, allowing the pilot to regain control of the aircraft by simply applying force to the controls. The servos automatically disengage in response to this manual input, ensuring that the system never inhibits pilot authority.

### Safety features

The system includes failsafe mechanisms:

- Manual override: The servos can be overpowered manually with minimal force.
- Servo failsafe: Servos disengage when the disconnect switch is activated or when power is cut off.
- Shear screw mechanism: Protects control linkages in case of servo mechanical failure.

### Operational modes

- Altitude hold: Maintains the set altitude.
- Vertical speed (VS) Mode: Controls climb or descent rates.
- Indicated Airspeed (IAS) Mode: Maintains a set airspeed during climbs or descents.
- NAV and HSI modes: Enable navigation tracking using external sources like GPS or VOR.

### Advanced features

- Yaw damper: Reduces unwanted yaw motions, enhancing stability and passenger comfort.
- Auto-trim: Automatically adjusts trim settings to minimize control surface forces during autopilot operation.
- VNAV: Provides guidance for altitude changes and approach profiles.

### Simplified vs. expert controls

- Simplified: Ideal for VFR pilots, focusing on ease of use with basic functions like TRK+ALT (track and altitude hold).
- Expert: Designed for IFR pilots, including full-featured modes, flight director options, and coupled navigation for precision approaches.

This system balances intuitive operation with sophisticated capabilities, catering to both general aviation and advanced navigation needs.

Data retrieved from the avionics system indicates that the autopilot was engaged about 10 minutes after takeoff and remained recorded as active until ground impact. At the time of the Accident, the autopilot electrical switch was recorded in the "ON" position. The Pilot stated that he manually disengaged the autopilot using the control yoke in response to the windshield failure. In light-sport aircraft configurations, applying force to the control yoke can manually override and deactivate the autopilot servos; however, this action does not change the electrical status of the system. Therefore, although the system remained powered and recorded as "ON" the available data does not confirm whether the servos were actively engaged at the time of the occurrence. It is highly probable that the servos were disengaged through manual override, which is not captured in the recorded parameters.



Figure 6. Simplified vs. expert controls

### Maintenance record

The Aircraft's 100-hour/annual maintenance inspection was carried out on 9 October 2024, at 344.30 flight hours, involving a series of critical checks and tasks to ensure its operational integrity. The comprehensive inspection was performed in line with the manufacturer's maintenance manual to ensure continued airworthiness.

This periodic inspection included thoroughly checking the engine, airframe, and critical systems. Engine performance was evaluated, oil and coolant levels were assessed, and the airframe was inspected for structural integrity, including any signs of fatigue, corrosion, or wear.

The fuel system was checked for leaks and proper operation, and control systems (ailerons, rudder, and elevator) were tested for smooth operation and alignment. Landing gear components were inspected for wear, pressure in the tires was verified, and brakes were tested for functionality. Safety equipment and the



recovery system were confirmed to be in compliance with operational standards.

In addition to these routine tasks, specific service bulletins (SBs) were addressed:

- SB A-32-06: Amended the *airplane maintenance manual* (AMM) to include detailed inspection procedures for the windscreen glass, ensuring early detection of cracks that could compromise structural integrity.
- SB A-32-12: Updated the *pilot operating handbook* (POH) with revised braking recommendations to prevent resonant vibrations in the main landing gear legs during hard braking on hard surfaces, thereby avoiding potential fatigue cracks in the landing gear attachment.
- SB A-32-18: Implemented enhancements to the nose landing gear to mitigate vibration and wear, improving overall landing gear performance and longevity.
- SB A-32-20: Applied structural reinforcements to high-stress areas of the airframe to enhance durability and resistance to fatigue over time.
- SB A-32-19: Optimized the propeller hub to address performance and longevity issues, ensuring efficient power transmission and reducing wear.
- SB A-32-15: Updated onboard avionics software to ensure compatibility with new systems and to improve overall functionality.

Each applicable SB was carried out in accordance with the manufacturer's instructions, ensuring continued airworthiness of the aircraft.

However, the Pilot stated that he had previously raised a concern regarding the condition of the windshield, reporting noticeable vibration during flight. He provided a video recording of the windshield vibration to the Investigation.

#### **SB A32-06 - Inspection of Windscreen Glass of A32 and A32L Aircraft<sup>9</sup>**

SB A32-06 addresses the inspection and maintenance requirements for the plexiglass (acrylic) windscreen of the A-32 model aircraft. It provides specific guidance for detecting cracks in the windscreen, stating that any crack extending beyond

the attachment strips must result in immediate replacement of the windscreen. It also advises against exposing the glazing material to substances such as fuel, solvents, or detergents, as these may lead to material degradation, including dimming and cracking. The estimated time required to perform the inspection is between 20 and 40 minutes, and the procedure does not require spare parts.

This SB was prompted by global customer feedback reporting issues with cracks in the windscreen glass, influenced by factors such as operational conditions, climate, and exposure to harmful liquids. Specific crack sizes and locations were identified as potentially compromising flight safety, necessitating strict adherence to the bulletin's guidelines.

Additionally, there has been a reported incident of windscreen glass breaking mid-flight. Investigations suggest this occurred because the instructions in SB A32-06 or the aircraft manuals were not followed. The windscreen's location in an area of dynamic pressure higher than the static pressure on the fuselage sides means that abrupt breakage can cause an immediate pressure surge inside the cockpit, potentially pushing out the doors.

In the Accident, the Pilot reported that he had verbally informed the Chief of Maintenance about the condition of the windshield vibration. Additionally, the Pilot provided the IIC with a video demonstrating the vibration observed in the windshield while the Aircraft was in cruise flight.

### **Meteorological Information**

As Al Jazirah Airport did not provide weather information services, the Investigation reviewed weather information provided by Ras Al Khaimah International Airport (OMRK).

All data are presented in table 4.

<b>Wind</b>	Direction 190 degrees, speed 2 knots
<b>Visibility</b>	CAVOK (Clear and Visibility OK), at least 10 kilometres
<b>OAT</b>	22°C
<b>Dew point</b>	17°C
<b>Pressure (Altimeter)</b>	1015 mbar

<sup>9</sup> Aeroprakt Manufacturing Sp., SB A32-06: AMM Amendment - Windscreen Glass Inspection, December 2, 2019. Available at:

[https://www.aeroprakt.de/images/Bulletins\\_A32\\_A32L/SB\\_A32-06\\_AMM\\_amendment\\_-\\_windscreen\\_glass\\_inspection.pdf](https://www.aeroprakt.de/images/Bulletins_A32_A32L/SB_A32-06_AMM_amendment_-_windscreen_glass_inspection.pdf)



<b>Condition</b>	Clear skies, no significant weather.
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The weather data was provided by the National Centre of Meteorology (NCM) and collected from the Umm Al Quwain station, located approximately 21 kilometres northeast of the crash site. However, the reports from this station are not of aviation-grade standards.

All data are presented in Table 5.

Table 5. METAR at 630 LT	
<b>Wind</b>	Direction 180 degrees, speed 2 knots
<b>Visibility</b>	CAVOK (Clear and Visibility OK), at least 10 kilometres
<b>OAT</b>	23°C
<b>Dew point</b>	19°C
<b>Pressure (Altimeter)</b>	1010 mbar
<b>Condition</b>	No significant weather.

Based on the weather data collected from both locations, the wind was normal.

## Aerodrome Information

Al Jazirah Airport is a privately-owned facility managed by the Club and dedicated to light sports aviation. It is located approximately 25 kilometres southwest of Ras Al Khaimah, at latitude of 25°39'55"N and longitude of 55°46'27"E, with an elevation of 10 feet above mean sea level (AMSL).

The airport features two runways: Runway 16/34, which is 500 meters long and 8 meters wide, and runway 10/28, measuring 768 meters in length and 14 meters in width (figure 7). The facility operates exclusively during daylight hours.

The Aircraft departed from runway 10/28.



Figure 7. Runways

## Organizational and Management

### Operations Approval

The Club operates under the *Light Sports Aircraft Organization* (LSA) approval, issued by the General Civil Aviation Authority (GCAA) of the United Arab Emirates, in accordance with *Civil Aviation Regulations – Light Sport Aircraft (CAR-LSA)*.

### Organization Structure

As outlined in the Club's organizational structure, the following roles are designated for its operational functions:

- Chairman
- Board of Management
- Accountable Manager
- Operations Manager
- Safety Officer
- Security Officer
- Chief Flight Instructor (CFI)
- Flight Instructors
- Examiners
- Chief of Maintenance
- Mechanics

The Aircraft was privately owned, and the Club has designated the following roles to oversee maintenance, licencing and authorize flights:

#### Chief Flight Instructor (CFI)

The Chief Flight Instructor (CFI) is responsible for upholding the Club's high standards in pilot training, ensuring compliance with safety and regulatory protocols, and overseeing the safety of flight operations, particularly in training and solo flight authorizations.

Reporting to the Operations Manager, the CFI's key responsibilities include:

- Maintaining rigorous standards for both pilot and student proficiency.
- Authorizing flights and actively monitoring flying conditions to ensure safe operations.
- Supervising all training staff and assigning responsibilities as needed.
- Managing student pilot training programs, conducting proficiency evaluations, and



recommending qualified students for the LSA Pilot Permit.

- Keeping accurate and up-to-date records of all Club's pilots.
- Acting on behalf of the Operations Manager during their absence to ensure continuity in training and operational oversight.

The CFI assists pilots in renewing his license and approves him after a flight examination check.

#### Flight Instructors & Examiners

Flight Instructors & Examiners have roles in the practical and theoretical development of students. Both report to the CFI, and their responsibilities are as follows:

##### Flight Instructors:

- Conduct flight and ground training, ensuring students acquire the necessary skills and knowledge.
- Provide pre- and post-flight debriefing, offering constructive feedback to students.
- Verify and maintain accurate entries in student logbooks.
- Ensure all training activities adhere to Club safety protocols and regulatory standards.

##### Examiners:

- Conduct official flight assessments and certification checks to validate student proficiency.
- Collaborate with the CFI to uphold consistent training standards.
- Perform proficiency and certification checks for pilots, ensuring ongoing compliance with required skill levels and regulations.

On the day before the Accident, the Pilot underwent a 45-minute evaluation with an Examiner on 25 October 2024. The evaluation included five landings, during which the Pilot successfully met the required standards to renew his license.

##### Chief of Maintenance

Chief of Maintenance ensures the airworthiness of all aircraft, directly reporting to the Operations Manager. His key responsibilities include:

- Coordinates aircraft and equipment maintenance.
- Maintains detailed maintenance records.

- Issues and revokes Flight Permits.
- Oversees facility upkeep and cleanliness.
- Trains and certifies mechanics.
- Delegates duties to qualified personnel in their absence.

##### Mechanics

Mechanics assist the Chief of Maintenance in maintaining aircraft and facilities to ensure safety and operational readiness. Their key responsibilities include:

- Perform maintenance tasks as directed.
- Maintain clean and organized facilities.
- Undergo training for specific aircraft types and systems.
- Step into delegated roles in the absence of the Chief of Maintenance.
- Scale support as fleet size increases.

The Aircraft has been maintained under the Club's maintenance services program, ensuring adherence to established aviation standards. The most recent 100-hour/annual inspection was completed at 344.30 flight hours on 9 October 2024. Maintenance activities were carried out by qualified mechanics, with all tasks duly documented on maintenance cards. These records were reviewed, verified, and formally signed off by the Chief of Maintenance.

##### ***Maintenance Procedure Manual***

The Aircraft was maintained under the Club's approved maintenance system at the time of the Accident. As per the Club's *operations, training & maintenance procedure manual*, the cockpit windscreen (cockpit glass) was subject to routine inspections during both flight permit evaluations and pre-flight transit checks. These procedures included verifying the glass for cleanliness, freedom from cracks, damage, and the integrity of its sealing and framework. According to the maintenance records reviewed, the windscreen was last inspected on 9 October 2024, with no recorded anomalies or findings at that time. There was no indication in the available documentation of any recent windscreen replacement.

##### **Additional Information**

###### **Similar Case**

On 23 February 2020, at approximately 0250 UTC, an in-flight incident occurred involving an Aeroprakt A32 aircraft near Mercer Airport, New Zealand. While

cruising at 2400 feet ASL, and a speed of approximately 105 knots, in fine weather, the windshield of the aircraft suffered a catastrophic failure without prior warning (figure 8). The sudden loss of the windshield caused severe turbulence inside the cockpit, dislodging items and temporarily impairing the pilot's ability to maintain a controlled flight.

The investigation into that incident found that the pilot-maintained control of the aircraft despite the chaotic situation, which included rapid deceleration and a nose-down pitch of approximately 25 degrees. Damage from the incident was extensive, including the complete disintegration of the windshield, deformation of both doors, and structural compromise to the fuselage around the door sills due to a sudden rise in cockpit air pressure. Despite these challenges, the pilot successfully communicated with ground personnel and executed an uneventful landing at Mercer Airport. The incident resulted in no fatalities,



**Figure 8.** A32 windshield

with the pilot sustaining minor injuries.

The investigation into that incident concluded that there was a critical need for robust manufacturing and maintenance protocols for aircraft components, particularly windshields, to withstand unexpected stressors. Operators of Aeroprakt A32 models and similar aircraft should inspect and verify the structural integrity of windshields and related components during routine maintenance. Additionally, enhanced pilot training for managing sudden structural failures in-flight could mitigate risks in similar situations. It was recommended that the manufacturer review design and material specifications of the affected parts and provide guidance for proactive measures to avoid reoccurrence.

A similar in-flight windshield failure involving an Aeroprakt A-32 aircraft occurred near Mercer Airport, New Zealand, on 23 February 2020. In that case, the

aircraft sustained significant structural damage; however, the pilot successfully conducted an emergency landing without fatalities. In contrast, the Accident subject to this Investigation resulted in a crash landing and serious injuries to both occupants.

The investigation identified key operational and environmental differences that contributed to the differing outcomes.

In the Accident subject to this Investigation, the windshield failure occurred at a recorded altitude of approximately 1,400 feet above sea level, limiting the Pilot's available time and vertical space to assess the situation and initiate recovery actions. By comparison, the New Zealand aircraft was cruising at 2,400 feet ASL, which afforded the pilot additional time and altitude to manage the emergency and prepare for a landing.

Terrain also played a significant role. The Aircraft involved in the Accident subject to this Investigation was operating over desert terrain, predominantly composed of sand dunes with limited flat surfaces, which constrained emergency landing options. In contrast, the New Zealand occurrence took place over relatively flat terrain with clear access to Mercer Airport, facilitating a safer forced landing.

Autopilot engagement at the time of failure further influenced the sequence of events. In the Accident subject to this Investigation, the autopilot was engaged, and the pilot was momentarily distracted while capturing external visuals. This resulted in a delayed transition to manual control during a critical phase. In the New Zealand case, the aircraft was manually controlled at the time of the failure, enabling a prompt response.

Finally, the physical condition of the pilots influenced their ability to manage the respective emergencies. In the Accident subject to this Investigation, the Pilot sustained multiple facial injuries caused by detached windshield fragments, which impaired visibility and further hindered aircraft control. Conversely, the pilot in the New Zealand occurrence remained physically capable, retained forward visibility, and was able to execute a successful emergency landing.

These distinctions underscore the role of situational variables including altitude, terrain, autopilot status, and injury severity in influencing the outcome of in-flight structural failures.



## Analysis

### The Pilot

The Pilot held a valid light sport aircraft (LSA) license for fixed-wing flying, with a total of 358.55 hours as pilot-in-command. Of these, 339.55 hours were specific to the Aeroprakt A32 model. He also had extensive experience conducting cross-country flights, including VFR operations both within and outside the United Arab Emirates.

On 25 October 2024, the Pilot completed a 45-minute examination to renew his LSA license, during which he successfully performed five landings.

Prior to the Accident, the Pilot had encountered several emergency situations, including instances of radio failure and emergency landings, demonstrating his familiarity with handling in-flight challenges.

On the day of the Accident, the Pilot was conducting a cross-country flight similar to the one performed the previous day. Accompanying him was a passenger who was a newly employed member of the Club.

### Aircraft Avionics System Data

During the Investigation, data was retrieved from the Aircraft's systems for analysis. The system recorded multiple parameters essential to understanding the Aircraft's performance and operational conditions. These parameters included engine performance metrics, RPM, AoA, wind speed (knots), and altitude bug (feet). Additional metrics such as ground speed (knots), ground track (degrees), airspeed bug (knots), and course (degrees) were also logged.

Further data included details on the CDI, such as source type, source port, scale (NM), and deflection. glideslope deviation, as well as various parameters related to the autopilot system, were captured. Autopilot data covered engagement status, roll mode, roll force, roll position, roll slip, and pitch and yaw parameters, including force, position, and slip.

The review of the dataset revealed no anomalies, malfunctions, or system failures. All recorded parameters were within normal operational ranges, indicating that the Aircraft's systems were functioning as designed throughout the flight as shown in the (figure 9).



Figure 9. Engine, RPM, groundspeed, autopilot data

### Autopilot System

Based on the data retrieved from the avionics system (figure 10), the autopilot was engaged approximately 10 minutes after takeoff and remained active until the ground impact.



Figure 10. Autopilot Data

Additionally, the electrical switch was recorded as being in the "ON" position at the time of impact, as indicated in the (figure 11).



Figure 11. Autopilot switch

The Pilot reported manually disengaging the autopilot by applying force through the control yoke following the windshield failure. However, the recorded data did not reflect a disengagement event, and the autopilot switch remained in the "ON" position throughout the flight, indicating that electrical power to the system was still present.

In light-sport aircraft, the autopilot switch energizes the system but does not confirm whether the servos are actively engaged. Manual override through the control yoke deactivates the servos but does not alter the electrical status or generate a recorded disengagement.

Therefore, while the autopilot system remained powered, the data does not conclusively confirm whether the servos were engaged at the time of the occurrence. It is highly probable that the Pilot manually overrode the autopilot, an action that would not be reflected in the recorded parameters.

## Maintenance Records

The Aircraft underwent its 100-hour/annual maintenance inspection on October 9, 2024, at 344.30 flight hours, and subsequently completed 14.25 flight hours without any reported malfunctions in the Aircraft system or engine from the Pilot.

However, the pilot indicated that he had verbally informed the Chief of Maintenance about a noticeable vibration in the windshield during the flight.

## Windscreen Glass

Maintenance records confirmed that SB A32-06, which involved inspecting the windshield glass for the A32 and A32L models, was executed during the Aircraft's maintenance on 9 October 2024. At the time, no cracks or deficiencies were reported. However, following this inspection, the Pilot raised concerns about windshield vibration observed during flight, verbally communicating this issue to the Chief of Maintenance. Video evidence provided to the Investigation further substantiated the Pilot's concerns, capturing the windshield vibration during the cruise flight.

The windshield was located in a region subject to dynamic pressure significantly higher than the static pressure experienced along the fuselage sides. This design feature amplified the potential consequences of a sudden windshield failure, as such an event could result in a rapid cockpit pressure surge. The resulting pressure differential posed a significant risk, including forcing the doors outward, which could further compromise the structural integrity and safety of the aircraft, pilot, and accompanying passenger.

## Conclusions

Based on the available evidence, the following findings, causes, and contributing factors were identified in relation to this accident. These findings are presented without assigning blame or liability to any specific organization or individual:

- Findings: Statements of all significant conditions, events, or circumstances pertaining to this Accident. These findings highlight crucial steps in the Accident sequence but are not necessarily causal or indicative of deficiencies.
- Causes: Actions, omissions, events, conditions, or combinations thereof that directly led to the Accident.
- Contributing Factors: Actions, omissions, events, conditions, or combinations thereof that, if eliminated, avoided, or absent, would have decreased the likelihood of the Accident occurring or mitigated the severity of its consequences. The identification of contributing factors does not imply fault or liability, whether administrative, civil, or criminal.

## Findings

- (a) The Club operated under a valid light sport aircraft (LSA) authorization issued by the GCAA.



- (b) The Pilot held a valid license for light sport aircraft (fixed-wing).
- (c) The Pilot had accumulated a total of 395.05 flight hours in various light sport aircraft types.
- (d) The Pilot performed a renewal license exam on 25 October 2024.
- (e) The Pilot was experienced in cross-country VFR flights.
- (f) The Pilot had 339.55 hours as pilot-in-command in the same Aircraft.
- (g) The Pilot owned the Aircraft since 26 May 2021, and pursued flying as a recreational activity.
- (h) The Aircraft was maintained under the Club's maintenance contract.
- (i) The Aircraft was equipped with an autopilot system capable of being engaged via an electrical switch and manually overridden through control yoke input.
- (j) The Aircraft was equipped with a windshield made of plexiglass (polymethyl methacrylate – PMMA).
- (k) The Aircraft was not equipped with UV-protective film or coating on the windshield and direct vision windows, resulting in exposure of the plexiglass material to prolonged ultraviolet radiation.
- (l) Data was retrieved from the Aircraft's avionics systems for analysis.
- (m) A review of the retrieved data revealed no anomalies, malfunctions, or system failures.
- (n) Based on the data analysis, the autopilot was engaged approximately 10 minutes after takeoff and remained active until the ground impact.
- (o) The Pilot stated that he manually disengaged the autopilot using the yoke to regain control of the Aircraft; however, the recorded data indicated that the electrical switch for the autopilot remained in the "ON" position at the time of the accident.
- (p) In light-sport aircraft configurations, the autopilot switch energizes the system but does not confirm whether the servos are actively engaged. Engagement typically requires specific command inputs, which may not be distinctly captured in the recorded parameters.
- (q) The autopilot system installed on the Aircraft allows for manual override through Pilot control input. When sufficient force is applied to the yoke, servo authority can be overridden without changing the recorded system status.
- (r) The Pilot, most probably, manually overrode the autopilot system without electrically disengaging it, which would explain the discrepancy between the Pilot's statement and the recorded data.
- (s) The Aircraft underwent a 100-hour/annual inspection on 9 October 2024.
- (t) The Aircraft had operated for 14.25 hours following the inspection.
- (u) Maintenance records confirmed compliance with *SB A32-06*, which involves inspecting the windshield glass for the A32 and A32L models.
- (v) The Pilot raised concerns about windshield vibration observed during flight and verbally communicated this issue to the Chief of Maintenance.
- (w) Video evidence provided to the Investigation further substantiated the Pilot's concerns by capturing windshield vibration during cruise flight.
- (x) Similar cases have indicated that windshields have exploded during flight.
- (y) The consequences of a sudden windshield failure included a rapid cockpit pressure surge, which poses significant risks, such as forcing the doors outward and compromising the structural integrity and safety of the aircraft, pilot, and accompanying passenger.

## Causes

The Air Accident Investigation Sector concluded that the direct cause of the Accident was the in-flight fracture of the Aircraft's windscreen.

The failure likely resulted from pre-existing structural weaknesses or stress factors, such as vibrations observed during prior flights, as reported by the Pilot and confirmed by video evidence.

The windscreen's sudden fracture caused an immediate and severe pressure differential within the cockpit, leading to forcing the doors outward and creating a situation that made it impossible for the Pilot to maintain control.

## Contributing Factors

The Air Accident Investigation Sector identified the following as contributing factors:



- (a) Compliance with *SB A32-06* for windshield inspection may not have been adequately thorough or effective.
- (b) The maintenance concerns were addressed verbally to the Chief of Maintenance without any proper documentation.

## Safety Recommendations

### Safety Recommendations

The Air Accident Investigation Sector recommends that:

#### Al Jazirah Aviation Club

##### SR08/2025

The maintenance records indicated that compliance with *SB A32-06* for windshield inspection lacked detailed reporting of findings.

Therefore, the Investigation recommends improving the maintenance log by including comprehensive documentation of the outcomes of each maintenance task and recording any identified issues, even if they are within acceptable limits.

##### SR09/2025

The Pilot indicated that the windscreen's condition was reported verbally without proper documentation, creating a risk of mismanagement of maintenance concerns.

Therefore, the Investigation recommends the Club to implement a formal and standardized log system for each aircraft to record all technical and maintenance reports. This log should be integrated with the maintenance records to ensure seamless tracking, timely resolution, and comprehensive documentation of all reported issues.

#### The General Civil Aviation Authority

##### SR10/2025

The Aircraft was equipped with a Plexiglass windshield and DV (Direct Vision) windows, which were exposed to prolonged outdoor parking. Such environmental exposure may accelerate material degradation, increasing the risk of in-flight structural failure.

Therefore, the Investigation recommends that the GCAA consider issuing safety guidance to aircraft operators with Plexiglass windshields, advising them to cover the windshield and DV windows from the outside when parked for extended periods, excluding short-term transit operations.

##### SR11/2025

Although the Aircraft had recently undergone a 100-hour/annual inspection and complied with *SB A32-06*, the Investigation determined that the existing inspection regime may not adequately account for UV-related aging and material fatigue specific to Plexiglass components.

Therefore, the Investigation recommends that the GCAA consider issuing a one-time mandatory inspection for aircraft fitted with Plexiglass DV windows. Additionally, the GCAA should encourage operators to develop periodic inspection schedules based on aircraft age, environmental exposure, and temperature variations.

This Summary Report is issued by:

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