XPENG AEROHT

XPENG AEROHT: ‘Land Aircraft Carrier’ Flying Car Overview

1. Technical Highlights

1.1 World’s First Onboard Autonoumous Separation and Reconnection System

Developed by XPENG AEROHT, this innovative onboard system allows for seamless storage and release of the air module.

The rotor can automatically deploy or fold, and with a simple one-click operation, the user can activate this futuristic process. New high-precision parking and motion coordination technology allows the ground module to align precisely with the air module, protecting the air module from nearly any ground movement. The system incorporates eight control modules (blade position control, rotor folding control, rear compartment control, ground module driving control, height control, air module towing control, landing gear deployment, and arm and fuselage locking) and 14 actuators, all precisely coordinated. Within five minutes, the 700+ kg “elephant” fits smoothly into the “fridge”. With the air module firmly fixed onboard, a six-wheel active suspension dual-buffer system significantly reduces vibrations.

As a breakthrough innovation, the ground module serves as both a transportation vehicle and an energy platform, addressing the challenges of mobility and storage for traditional aircraft. It provides a “mobile home” for the air module, allowing automatic energy replenishment and entry/exit regardless of complex terrains and weather. This is truly a ‘Land Aircraft Carrier’, giving users seamless mobility and free flight.

1.2 Intelligent Flight Control System

The air module of the ‘Land Aircraft Carrier’ supports both manual and autonomous driving modes, where an intelligent flight control system governs flight attitude and performance for safe, reliable flight.

- **Intelligent Manual Driving Mode**
    - Featuring a revolutionary single-stick control system, making it extremely easy for every user to learn how to fly.
    - Single-hand, single-stick control simplifies flight, replacing the complex traditional control of fixed-wing and helicopter dual-hand, dual-foot mechanisms.
    - The air module’s flight relies on six parameters: three speed and three attitude parameters. Pilots manage climb rate, forward speed, lateral speed, and heading, with attitude and altitude stability controlled by the flight control system, reducing the skill threshold for users.
    - Stick controls include push/pull for forward speed, lateral tilt for lateral speed, twist for heading, and knob for vertical speed adjustments.
    - **Dual Driving Mode Options:** To cater to varied user experiences, users can select between Comfort and Sport modes.

- **Comfort Mode:** Smooth attitude changes with slower acceleration and deceleration, favoring comfort, ideal for daily use.

- **Sport Mode:** Quick attitude shifts with faster response times, emphasizing handling pleasure, though it sacrifices some comfort.

- **Autonomous Flight Mode**

  - **Auto Route Planning:** The system plans safe, economical routes based on the user's flight plan inputs (waypoints, speed, altitude) and precision low-altitude maps.

  - **Auto Cruise Flight:** Real-time forward and downward environment monitoring sensors provide situational awareness, issuing collision alerts to prompt avoidance if needed.

  - **Pilot Override Capability:** During autonomous flight, pilots retain override control via the stick and can switch to manual control.

  - **Smart Return-to-Home Feature:** Users can press a single button in the cockpit to end the flight and return to the takeoff point efficiently.

  - **Assisted Approach Feature:** Allows the user to select landing points on the cockpit screen and guide the air module to a safe landing.

2. Key Product Highlights

2.1 The World's First Modular Flying Car Set for Mass Production

Four Challenges of Traditional Aircraft:

1. **Storage Difficulty:** Traditional aircraft require substantial parking space and generally need to be stored at airports. Long-term storage also demands regular maintenance to ensure safety.

2. **Recharging Difficulty:** For electric aircraft, limited charging infrastructure can hinder the availability of energy supply.

3. **Complex Learning Curve:** Operating traditional aircraft requires extensive theoretical knowledge and skills, making training a high-barrier process.

4. **Limited Mobility:** Moving aircraft on the ground is challenging, often requiring towing services to transport the aircraft to designated take-off and landing sites.

Addressing these pain points, XPENG AEROHT developed the 'Land Aircraft Carrier', an amphibious modular flying car. Equipped with the world's first onboard automatic separation and reconnection system, it can house the air module entirely within the trunk of the ground "mothership", offering unrestricted mobility and freedom to fly:

- The ground "mothership" transports the air module to any destination. With one command, the modules separate autonomously—the air module's arms extend, and landing gear deploys, ready for low-altitude flight.

- Upon landing, the ground "mothership" can precisely locate the air module for reconnection. The arms fold up, and the air module re-enters the ground module's trunk, allowing for a smooth continuation of the journey.

2.2 Ground "Mothership": A Six-Wheel Vehicle Easy to Drive with

the Standard Driver's License

2.2.1 A Striking "New Species" Aesthetic

- Operable with a Class C license, the vehicle measures approximately 5.5m in length, 2m in width, and 2m in height. It fits standard parking spaces, is garage-compatible, and requires no special storage—ideal for everyday use.

- **Design Highlights:**

    - A "lunar rover" for Earth, with sharp, cyber-mech-inspired lines giving it an unmistakable "new species" look.

    - Crystal-inspired, continuous front headlights that embody futuristic aesthetics.

    - A "galactic parabolic line" spans from headlights to rear, giving a dynamic silhouette with clean, minimalist contours. The floating roof and dark wheel arches complete its sleek side profile.

    - **Electric, Dual-Swing Doors:** Doors that open automatically, offering a refined and exclusive cabin experience.

    - **Discreet One-Way Transparent Windows for Rear Passengers:** These blend seamlessly into the vehicle's body, enhancing both privacy and visual appeal.

    - **Semi-Transparent Aircraft Storage Compartment:** The compartment features translucent glass, giving a glimpse of the stored air module—a display of advanced technology at rest or in motion.

    - **Foldable Streaming Rearview Mirrors:** The rearview mirrors automatically unfold when driving and retract into the fenders when parked, aligning with the minimalistic design.

The ground "mothership" overcomes unprecedented engineering challenges to provide a spacious trunk capable of storing an entire air module while maintaining a comfortable four-seater cabin.

2.2.2 Unrestricted Exploration and Seamless Travel

- **World's First 800V Silicon Carbide Range Extension Power Platform:** With a combined CLTC range exceeding 1000 km, it meets long-distance travel demands with ease.

- **Three-Axle, Six-Wheel Drive, with Rear-Wheel Steering:** This layout enhances load-bearing capacity and off-road performance.

- **Mobile Supercharging Station:** Acting as a high-power recharging station, the ground "mothership" powers the air module during both driving and parking, supporting up to six flights on a full charge—always ready for immediate takeoff.

2.3 Air Module: Electric Vertical Take-Off and Landing (eVTOL) Aircraft

2.3.1 Lightweight Panoramic Cockpit

- **Innovative Dual-Duct Six-Rotor Design:** Both propellers and arms are foldable, allowing the air module to be completely stored in the trunk of the ground "mothership".

- **Carbon Fiber Construction:** The body structure and propellers are made from carbon fiber, balancing high strength with lightweight efficiency.

- **270° Panoramic Dual-Seat Cockpit:** Designed for an expansive flight view.

2.3.2 800V Silicon Carbide High-Voltage Platform

- **Leading Battery Energy Density:** Exceptional energy storage capacity in the battery system.

- **Efficient Propulsion System:** High-performance, compact design that makes flying effortless.

2.3.3 Intelligent Flight Control and Navigation System

- **Triple-Redundancy Fly-by-Wire System:** Ensures full-authority control with heterogeneous redundancy.

- **Electronic Fencing for Boundary Protection:** Keeps the module safely within designated flight zones.

- **Multi-Source Navigation Integration:** Enables coverage across various flight scenarios.

- **Dual Environmental Adaptability and Electromagnetic Compatibility:** Compliant with both aviation and automotive standards.

2.3.4 Superior Safety

- **Full Redundant Safety Design:** All critical systems include redundancy (dual redundancy for propulsion, power supply, and communications, and triple redundancy for flight control and operation). Should the primary system fail, the secondary system takes over seamlessly.

- **Automatic Adjustments for Rotor Failure:** In the rare event of dual rotor failure, the flight control system responds within milliseconds to ensure safe flight, meeting civil aviation safety standards.

- **Comprehensive Testing Across Over 200 Units:** Rigorous testing of components, systems, and complete air modules, including single-point failure tests and “Three High” tests (high temperature, high altitude, and extreme cold) to validate performance and reliability under adverse conditions.

2.3.5 Easy-to-Master Operation

- **Manual and Autonomous Modes:** Supports both manual and automated piloting.

- **Single-Stick Control System:** Allows intuitive single-hand operation, simplifying traditional dual-hand, dual-foot controls. The system is designed to be extremely easy for every user to learn how to fly.

- **Intelligent Flight Assistance:** Features one-touch takeoff, automated route planning, real-time airspace monitoring, and landing vision assistance, making flying simpler and more accessible.

2.4 Application Scenarios for the ‘Land Aircraft Carrier’ Flying Car

XPENG AEROHT is committed to providing safe, intelligent flying cars and low-altitude mobility

solutions. Together with partners across China, XPENG AEROHT is rapidly expanding application scenarios for the ‘Land Aircraft Carrier’. To date, XPENG AEROHT has signed agreements for over 130 flight camps, with plans to surpass 200 locations by year’s end.

- **For Individual Users:**

  Drive and fly seamlessly, enjoying the freedom to go whenever and wherever you want. Expand the dimensions of road trips to include the skies, offering users a new travel experience where "mountains and seas are yours to cross, and the world is yours to explore".

- **For Public Service Applications:**

  - **Emergency Medical Evacuation**
  - **Short-Distance Obstacle-Crossing Rescue**
  - **Highway Accident Response**
  - **High-Rise Emergency Evacuation Pods**

2.5 Commercialization Timeline for the ‘Land Aircraft Carrier’

- **November 12**: China Air Show – First Global Public Flight (Location: Zhuhai Doumen Lianzhou Exhibition Area)
- **November 12-17**: China Air Show – Static Display (Location: Zhuhai International Air Show Center, Hall 8)
- **November 15**: Guangzhou International Auto Show – Public Flight (Location: North Plaza, Exhibition Hall A, accessible from Hall 5 and the Exhibition Center’s Gate 1)
- **December**: Global Launch Event and Pre-Sale Kickoff; mass production deliveries anticipated in 2026.
- **2025**: Completion of Mass Production Plant
- **2025**: Attainment of Chinese Civil Aviation Type Certification
- **2026**: Mass Production Deliveries of the ‘Land Aircraft Carrier’

2.6 Overview of the Flying Car Mass Production Facility

On October 27, 2024, construction began on the XPENG AEROHT Intelligent Manufacturing Base, the world’s first mass-production flying car factory with a modern assembly line. This facility will produce the air module for the modular ‘Land Aircraft Carrier’ flying car, with an annual production capacity of 10,000 units.

Located in Guangzhou’s Development Zone, the initial phase of the Intelligent Manufacturing Base covers approximately 180,000 square meters, with dedicated composite material, assembly, painting, and general assembly workshops. The facility combines the high-quality standards of aviation with automotive-scale production, enhancing consistency, reducing costs, and shortening lead times. This will further integrate the electric vehicle and low-altitude economy industries.

- **Self-Developed and Self-Manufactured for Quality Control:** XPENG AEROHT will maintain full-stack development and in-house production of core components to ensure quality and cost efficiency.

- **Compact Layout and Efficient Production:** Through combined workshop facilities and centralized warehousing, the factory minimizes logistical waste and maximizes production efficiency.

- **Precision Traceability and Quality Assurance:** The plant utilizes a comprehensive, fully-traceable production management system that meets aviation safety standards, ensuring each part has a unique "identifier" from supply chain to final assembly.

- **Green Energy and Emissions Management:** Powered by photovoltaic energy, the facility is equipped with energy-saving solutions for high-consumption equipment and a digital energy management system to monitor usage and efficiency, significantly reducing carbon emissions.