

Green Solar Airship

Peter Lobner, 8 February 2022

1. Introduction

The multi-purpose Green Solar Airship design concept was developed in 2014 and unveiled in Paris by architects Jean-Marc Schivo and Lucilla Revelli (JM Schivo & Partners) and consultant / coordinator Gérard Feldzer (Transport Passion, Paris) for a private client. The JM Schivo & Partners website is here:

<http://www.jmschivo.com>

Their Green Solar Airship project is presented on their website at the following direct link: <http://www.jmschivo.com/schivo-architects-selected-projects/schivo-architects-projects/item/355-innovation-green-solar-airship.html>



Source: JM Schivo & Partners

The Green Solar Airship received the 2016 Jacques Rougerie Foundation's Special Mention Award for "Innovation and Architecture for the Space." You'll find a short (1:31 minute) video about this award at the following link:

<https://www.youtube.com/watch?v=puLeAKm9fx8>

2. Description of the airship

This large hybrid airship has an aerodynamic shape derived from a Manta Ray. As a hybrid airship, total lift is the sum of aerostatic lift from the helium lift gas, propulsive lift from the vectorable propulsors, and aerodynamic lift from the hull in forward flight. This hybrid airship can carry 50% more payload than with aerostatic lift alone.

The Green Solar Airship can be configured for a wide range of applications, including regional passenger or heavy load transportation, local tourism, flying luxury hotel / cruise ship, scientific research, surveillance (environmental, security), emergency response and military.

This is an all-electric airship designed for silent flight and non-polluting operation. With long range, high maneuverability, and a vertical takeoff and landing (VTOL) capability, this airship can bring air service to areas of the world that have not been easily accessible due to lack of airport infrastructure. This airship can visit and hover over sensitive natural areas, such as remote deserts, islands and forests, as well as urban areas and town centers without contributing to atmospheric and acoustic pollution.



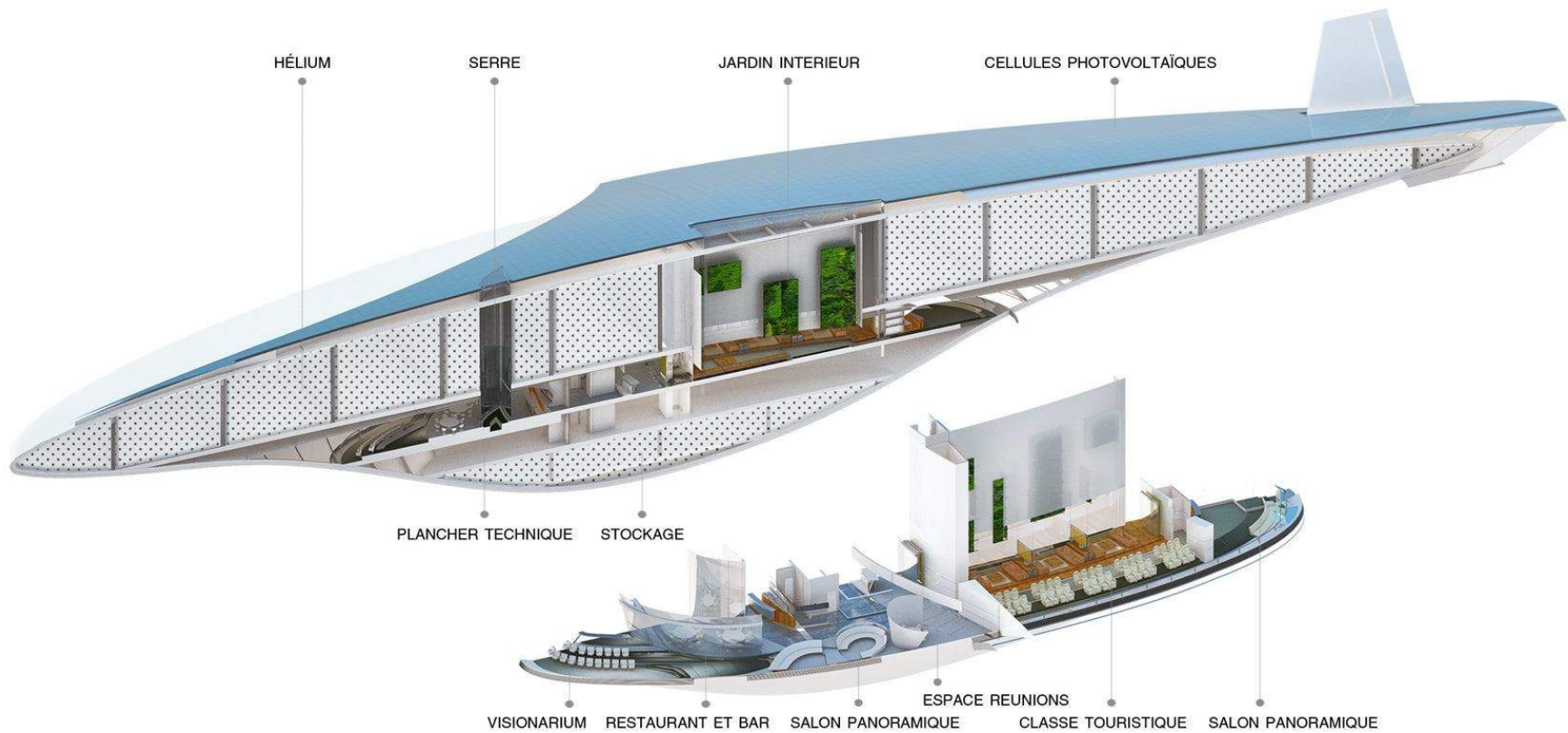
Source: JM Schivo & Partners

General characteristics of the Green Solar Airship

| Parameter | Green Solar Airship |
|---------------------|---|
| Airship type | Rigid, all-electric, solar-powered |
| Structural mater | Aluminum, carbon fiber and composite materials |
| Length | 165 m (541 ft) |
| Span | 45 m (147.6 ft) |
| Lifting gas | Helium, in 8 lifting gas cells |
| Lifting gas volume | 75,000 m ³ (2,648,600 ft ³) |
| Power system | Hybrid electric power system with solar supplemented by batteries and/or regenerative hydrogen-oxygen fuel cells <ul style="list-style-type: none"> • 7,000 m² (75,350 ft²) solar photovoltaic array on the hull • Solar average continuous power: 1,400 kW (1,877 hp) • Fuel cell average continuous power: 1,000 kW (1,341 hp) • Maximum power available for takeoff, landing or emergency maneuvers: 4,000 kW (5,364 hp) from solar plus batteries and/or fuel cells |
| Propulsion system | 6 or 8 vectorable electric motor driven ducted fans mounted under the hull (2 or 4 flank-mounted single fans and 2 stern-mounted pairs of fans) |
| Speed, cruise | 90 kph (56 mph) |
| Speed, max | 180 kph (112 mph) |
| Altitude, operating | 500 to 2,500 m (1,640 to 8,200 ft) |
| Payload | 35 metric tons (38.5 tons) of freight / passengers |
| Accommodations | <ul style="list-style-type: none"> • 45 passengers for long distance flights • Up to 120 passengers for short haul flights |

The Green Solar Airship hull is arranged in four levels:

- 1st (top) level: 8 helium lifting gas cells and air ballonets
- 2nd level: technical equipment area housing batteries, hydrogen reservoirs (for fuel cells) and other equipment
- 3rd level: 1,400 m² (15,070 ft²) of multi-purpose space for passenger / client activities, configurable to meet various needs
- 4th (bottom) level: 400 m² (4,305 ft²) dedicated piloting station, crew quarters and airship electronic systems



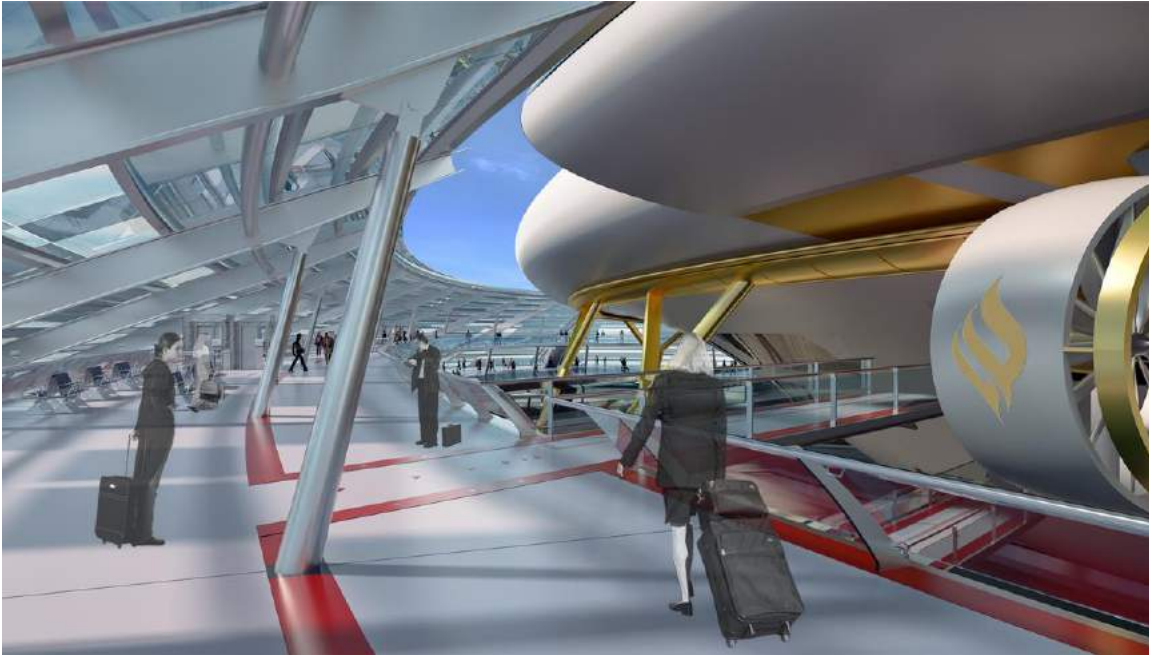
*Green Solar Airship cross-section of the hull.
 Source: JM Schivo & Partners*



Airship docked at an airport. While the airship is docked, shore power is connected to charge the batteries and fuel cells.

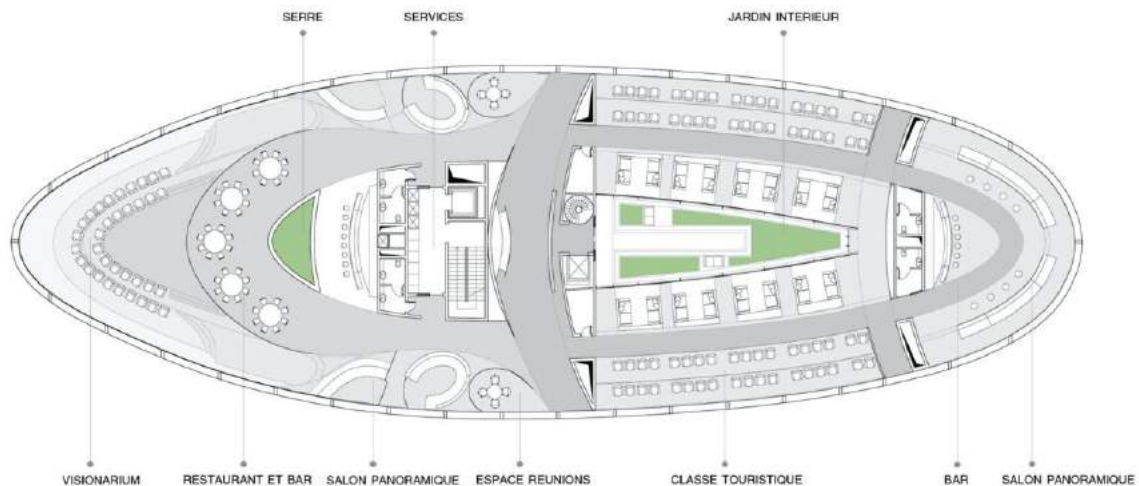


*Stern view of the airship docked at an airport.
Note the stern pairs of ducted propellers.
Source, both graphics: JM Schivo & Partners*



*Exterior view of an airship docked at an airport.
Source: JM Schivo & Partners*

Design concepts for three types of interiors for the 3rd level multi-purpose space were developed: regional transport, flying hotel, and a special interior for Expo Dubai 2020. The interior design concept for a regional transport is shown in the following graphics from JM Schivo & Partners.



3rd level floor plan. Bow is left, stern is right.



Tourist class seating amidships.



Interior atrium.

Source, both graphics: JM Schivo & Partners



Bar area looking toward the bow seating area.



Bow seating area.

Source, both graphics: JM Schivo & Partners

As a flying hotel, the 3rd level multi-purpose space would be outfitted with a mix of basic and luxury staterooms.



A basic stateroom.



A luxury stateroom.

Source, both graphics: JM Schivo & Partners

The special interior for Expo Dubai 2020 included a conference space in the central atrium.



*The central atrium transformed into a conference space.
Source, both graphics: JM Schivo & Partners*

3. For more information

- “Green Solar Airship - Jean-March Schivo, Lucilla Revelli, Gérard Feldzer, Architects,” Architizer:
<https://architizer.com/projects/green-solar-airship-jean-march-schivo-lucilla-revelli-gerard-feldzer/>

Other Modern Airships articles

- *Modern Airships - Part 1:* <https://lynceans.org/all-posts/modern-airships-part-1/>
- *Modern Airships - Part 2:* <https://lynceans.org/all-posts/modern-airships-part-2/>
- *Modern Airships - Part 3:* <https://lynceans.org/all-posts/modern-airships-part-3/>