

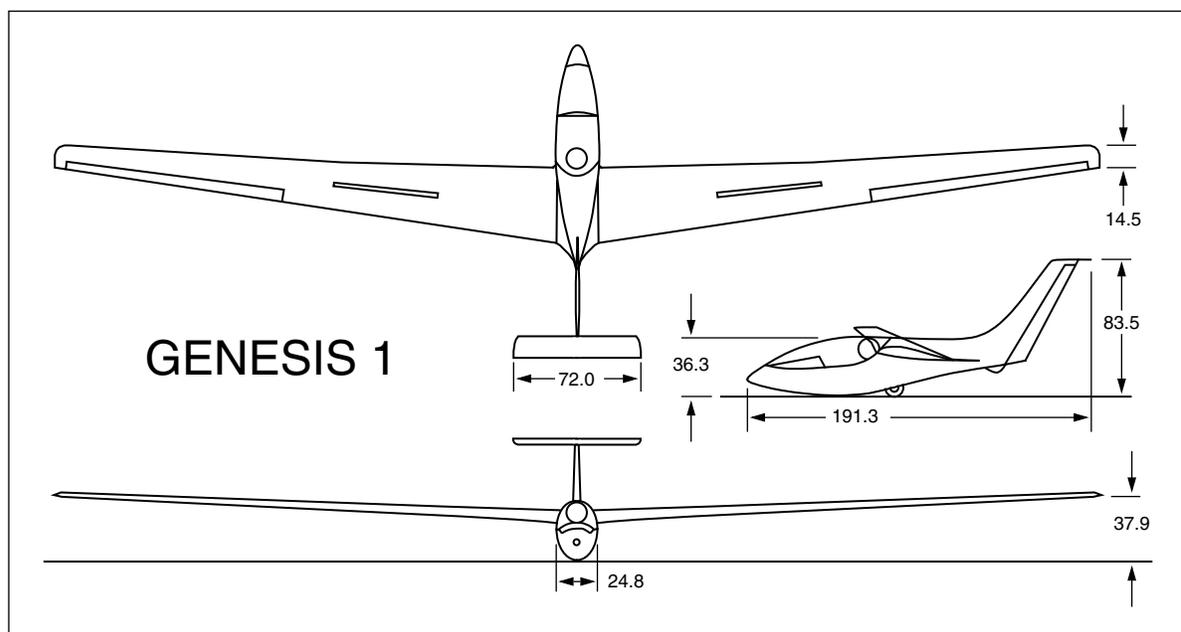
Group Genesis' Genesis 1 and Genesis 2

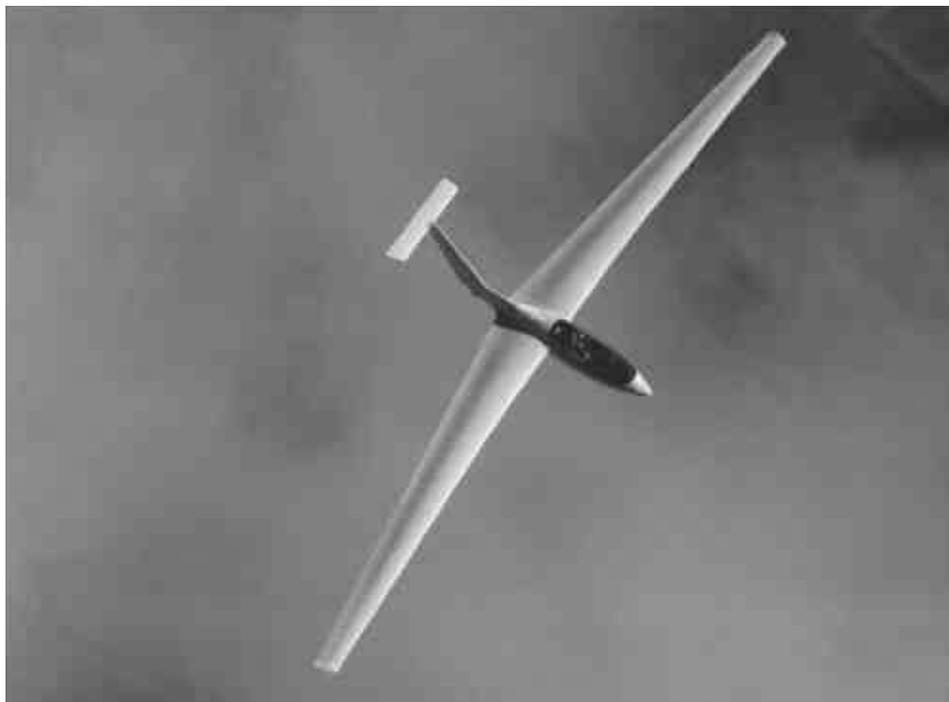
In 1988 we received a letter from Jim Marske, designer of the Pioneer II series of tailless sailplanes. The letter explained how John Roncz had come up with some excellent airfoils for aircraft using the Pioneer II planform. These new airfoils demonstrated laminar flow over a major portion of the upper surface and nearly the entire lower surface. This was exciting, as the laminar flow was in evidence over a wide angle of attack range.

A few years later, in 1994, we saw an advertisement for the Genesis 1 sailplane in the May issue of *Kitplanes* magazine. The included 3-view, although small, portrayed the Genesis 1 in an impressive manner. Contacting the factory netted us a very nice letter from Jerry Mercer, and promotional information sufficient to build a scale model.

The Genesis was designed to meet a goal - design the best Standard Class sailplane in the world - by achieving several objectives:

- take advantage of the efficiency of a tailless planform;
- produce a superior product at a lower price;
- achieve better performance than Klaus Holighaus's Discus while maintaining relatively docile handling characteristics.





An overhead view showing the gently forward swept wings

Engineer for the Genesis project is Jim Marske, of Pioneer and Monarch fame; the airfoil was designed by John Roncz, best known as the designer of the airfoils used on the 'round-the-world Voyager.

Genesis 1 was developed nearly entirely on computer. A complete description of the design process, including software used, was published in the September 12th 1994 issue of *Design News*.

The Genesis has forward swept wings, a short fuselage, and a “thresher” vertical tail. It is a tailless sailplane, despite what looks to be a horizontal stabilizer at the top of the vertical surface. That horizontal surface is a full flying trim tab, used only to set the angle of attack of the wing. Its position is as far aft of the CG as possible, thus providing a maximum lever arm, thus reducing required deflection angles. The wing sections, sweep, and wing twist have been designed to make the main wing entirely self-stabilizing.

Maiden flight of the Genesis took place on November 15 1994. Optimization of the design came through several hundred hours of flight testing, over half of which were flown under competition conditions. The improved design was given the name Genesis 2, and includes the following improvements over the Genesis 1:

- Genesis 2 will be almost 150 pounds lighter, allowing a greater wing loading range;

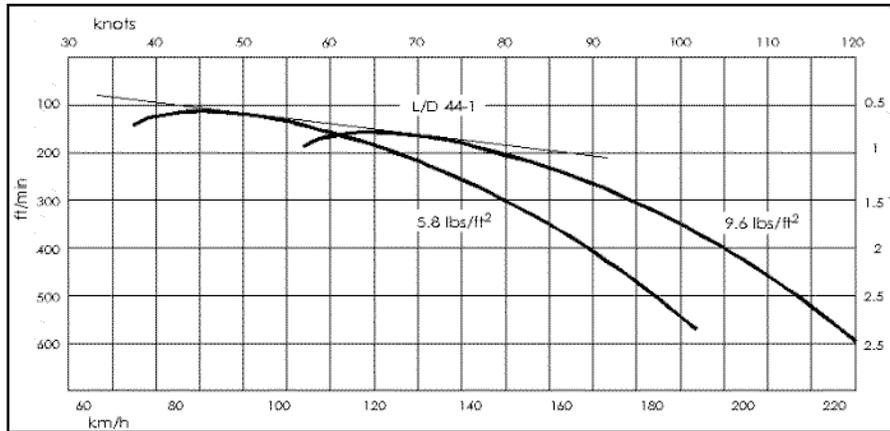


This photo shows the high aspect ratio “thresher” vertical stabilizer and sleek fuselage shape.

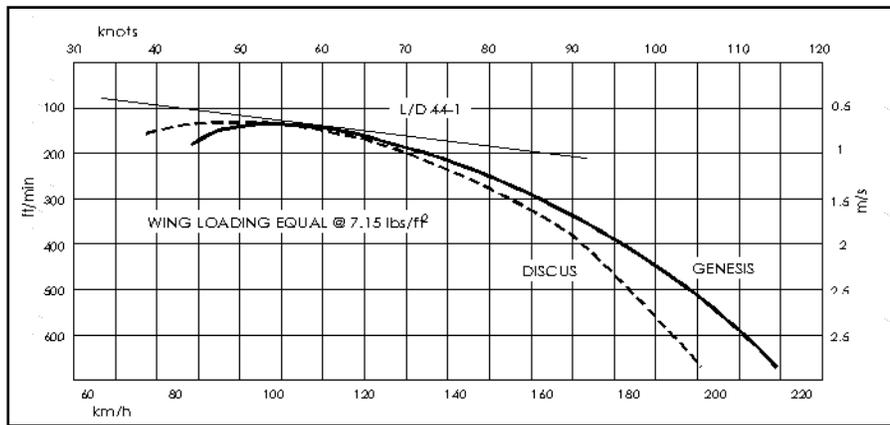
- aerodynamic twist was reduced by nearly two degrees, improving climb and high speed performance;
- the wing tip and outer wing airfoil sections have been refined to generate more lift while creating less drag;
- a retractable nose wheel has been added;
- fuselage contour lines and fairings have been smoothed and modified to reduce airflow separation;
- the leading edge radius and airfoil section on the vertical stabilizer have been modified also to reduce drag;



Genesis in flight over Marion Ohio



Genesis 2, 5.8 and 9.6 lbs./ft²



Genesis 2 vs. Discus, 7.15 lbs./ft²

- aileron control forces have been made lighter through better mechanical advantage, a changed aileron aspect ratio, and new aileron hinge points;
- a new canopy separation line gives better visibility.

The included polars show the performance of the Genesis 2 at wing loadings of 5.8 and 9.6 lbs./ft², and against the Discus at 7.15 lbs./ft².

The Genesis 2 is currently being manufactured by Sportine Aviacija, formerly LAK (Aircraft Factory of Lithuania). A completed Genesis 2 sailplane, certified in the Experimental/Racing category, is \$44,900 (U.S.) FOB Lithuania.

Charlie Fox, of Davenport Iowa, built a 1/3 scale “proof of concept” model of the Genesis 1 for Group Genesis. The model is capable of very steeply banked turns and thermals easily. Gordy Stahl wrote about Charlie’s model in the February 1995 issue of RCSD.

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All photos included in this article are from the Group Genesis web site. For a movie of the Genesis in flight, download the following file:

<http://www.groupgenesis.com/glider.mov>

Genesis 1 Specifications		
Structure	Composites: Hexcel fiberglass throughout, carbon fiber spar caps, and Kevlar layers around cockpit	
Airfoil	Roncz G-74S	
Wingspan	15 meters	49 ft. 2½ in.
Length	4.87 meters	15 ft. 11¼ in.
Height	2.13 meters	6 ft. 11-1/2 in.
Wing area	11.20 m ²	120.5 ft ²
Aspect ratio	20.2	
Empty weight	223 Kg.	490 lbs.
Payload	303 Kg	667 lbs.
Gross weight	525 Kg	1157 lbs.
Maximum wing loading	46.9 Kg/m ²	9.6 lbs./ft ²
Maximum L/D	43.2 @ 120.6 km/h*	43.2 @ 74.9 m.p.h.*
L/D @ 100 knts	29.5	
Minimum sink	0.58 m/s @ 83.47 km/h.*	1.9 fps @ 51.75 m.p.h.*
Stalling speed	68.6 km/h. *	42.6 m.p.h. *

* = estimated

