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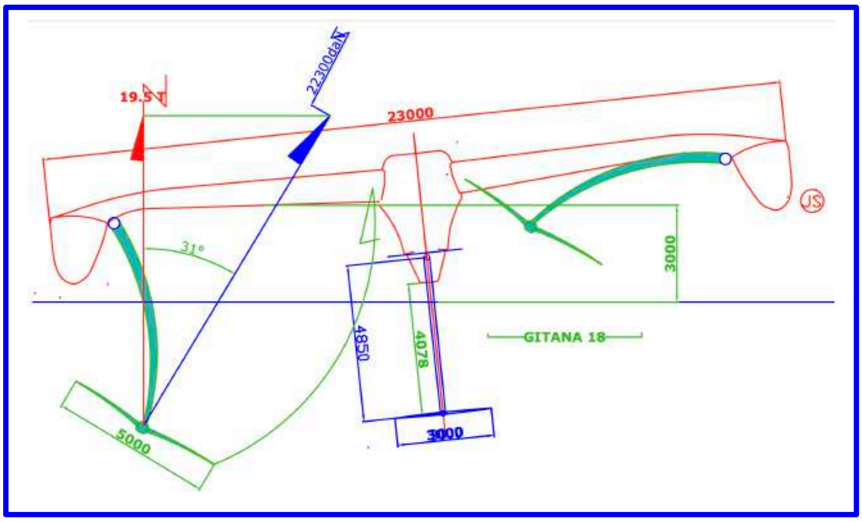
EDMOND DE ROTHSCHILD

Gitana 18 … after G17.
A new "**ULTIM**" in January 2026.

A quick introduction.



This foiler is the result of collaboration between BE Gitana and Guillaume Verdier.

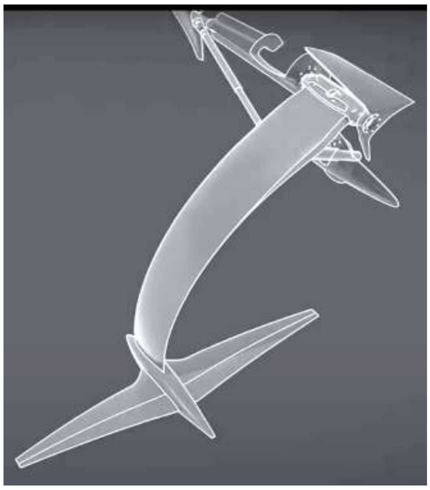
The platform: Still a trimaran, with a carbon pre-impregnated construction, but with around 90% of the components manufactured in an oven. This promotes rigidity, which is important since G18 is an integral foiler where all the appendages that extract or ensure trim in flight are limited to four points located on a float and on the central hull. As G18 is designed to fly at an altitude of around 3 metres at speeds of between 20/25 and 40 knots, studying the platform's passage through the air becomes important. The designers have optimised the Cx (drag coefficient), especially at the central nacelle.

Lifting surfaces:

G18 has abandoned the L-shaped foil technology used on each float. It has adopted the inverted T-shaped foil (G18 refers to it as a Y-shaped foil) already developed on the AC75 and this year on the SailGP F50 catamarans.

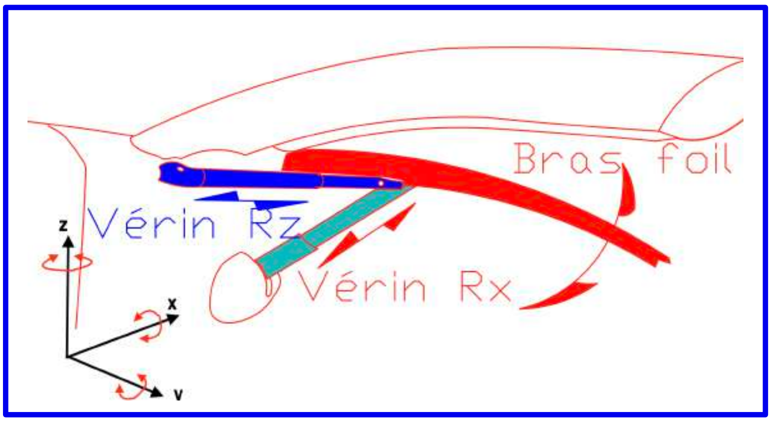
However, installing each foil directly under the hull of the floats, as on the F50s, requires a very long vertical arm, which is subject to high bending stresses and therefore relatively fragile, if the aim is to fly at an altitude of 3 metres. G18 has opted for a pivoting arm, similar to the AC75 or Ferrari, with the centre of rotation located close to the inner edge of each float and slightly behind the front arm.

This arm has three degrees of freedom of rotation: longitudinal axis Ox, transverse axis Oy, vertical axis Oz.



Rotation around Ox allows the unused foil to be retracted. It also allows lateral adjustment of the lift position (active foil), i.e. retracting or extending (within the 23 m limit of the gauge) depending on the desired righting moment (upwind or downwind sailing).

Rotation around Oy reduces foil drag. In fact, the basic profile of the foil (NACA 12% type) can be more or less curved. However, once the profile has been chosen, it cannot be changed. If a curved profile is chosen, it performs well when sailing close-hauled, but produces more drag when sailing downwind... Rotation around OY reduces this drag without significantly altering the lift.



Rotation around OZ (vertical axis) reduces the drag of the connecting arm depending on the position (Ox and Oy rotation).

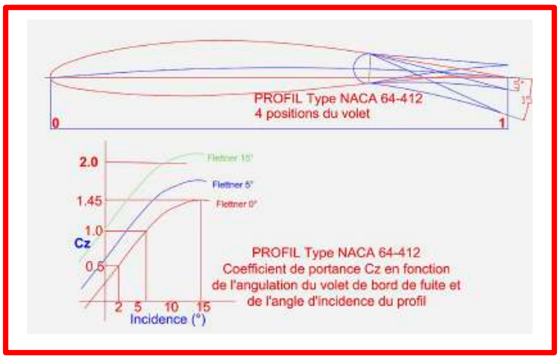
However, these rotations are not initiated continuously during navigation. They are adjusted for a long downwind leg or upwind navigation or another point of sail.

The foil consists of two symmetrical wings equipped with a trailing edge flap. The total wingspan is 5 metres. The flap increases the camber in order to obtain the Cz (unit lift coefficient) necessary to lift the foiler according to its speed.

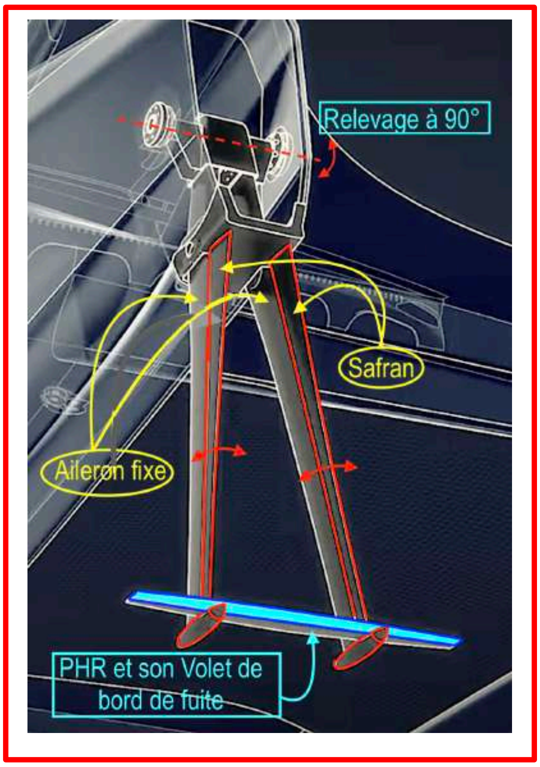
On a take-off base (G18) at a speed of 20 knots (25 knots for G17), i.e. 10 m/s, each wing of the foil must generate a lift of 206,300 N / 2 = 103,150 Newtons in order to create a "vertical lift" of 19.5 tonnes.

The product Cz * S becomes 103,150 / (0.5*1025 * 10^2) = 2.013

With a Cz of 1.6, we obtain a foil surface area of 1.25 m² (i.e. an upper chord of 0.8, a lower chord of 0.2 and a wingspan of 2.5 m).
This translates into an aspect ratio = 2.5^2 / 1.25 = 5



Another special feature of the G18 foil is the independent control of the trailing edge flap on each wing. This is an original choice, as it allows the angle of the outer wing to be increased and that of the inner wing to be decreased (the projection of the sum of the two lift forces remaining at 19.5 T) and the resultant to be moved outwards, which increases the righting moment.



<u>Management of the platform's horizontality</u>.
Four horizontal stabilisers (PHR) and three double rudders are installed. During navigation, the platform is controlled by:

- Two PHRs at the ends of the central rudder and the float rudder. These two PHRs manage pitch (nose down, nose up).
- The HCR installed at the end of the stingray wing (central) manages the transverse attitude (heeling).

These HFRs therefore act as lift or downforce. The technology used for the two types of rudders is identical. It uses two fixed ailerons in a slight inverted V shape, each equipped with a trailing edge flap. When this flap pivots, it causes the aileron + flap profile to pitch up, creating lift that induces yaw movement in the foiler.

The ultimate goal of this technology is to limit the aerodynamic ruin of PHRs by vertically propagating the ventilation phenomenon along the rudder, which originates at the water/air interface.

The system installed on the floats is identical, but with vertical translation lifting.

Conclusion.

The abandonment of "L" foils is logical, as this technology requires heavy and energy-intensive mechanical systems. Indeed, adjusting the angle of incidence requires the entire foil to be rotated (Ry rotation), which requires 300 bar hydraulics and an 80 mm diameter cylinder. The foil lifting technique prevents the installation of trailing edge flaps to modify the foil's unit lift (Cz). In addition, the response times of all this hydromechanical technology are very long. An inverted T-shaped foil is much more flexible and efficient, as the Cz can be adjusted by modifying its angle of incidence, which is technically simple.

All of these innovations have three objectives:

- To increase power when the trimaran is operating in Archimedes mode and can take off at a slightly lower speed. It should be noted that this power difference is no longer useful once the platform is flying. To obtain this extra power, as it is impossible to modify the surface area of the sails, the skipper or crew has no choice but to increase the aerodynamic Cz of the mainsail, i.e. its shape. This requires a mechanical system that modifies the bend of the mast (modification of the angle of action of the spreaders).

- Reduce, as much as possible, the devastating effects of ventilation and cavitation on the lifting surfaces. Disturbances resulting from the flow of a streamlined shape in a fluid. On the G18, each angle of the trailing edge flap (active foil) is independently controlled. This technical choice makes it possible to control the relative camber of the fixed part of the wing and its flap and to adjust it so as not to trigger cavitation on the upper surface of the wing.
  The dual rudder solution on the ailerons, which equip each float and the central hull, should reduce the risk of ventilation occurring at the air/water interface. The thickness and fixed incidence of the aileron should serve this purpose.
  In my opinion, the idea behind the double rudder is that if ventilation occurs, it will not affect both the aileron and rudder assemblies simultaneously, but only one of them, and that if ventilation develops on one assembly, it will not spread to the entire surface of the PHR.

- Improve average speed with faster take-off, greater responsiveness in platform horizontal attitude adjustments, achieve minimal foil drag while maintaining optimal Cz (rotation around the Oy axis and optimal orientation of the trailing edge flaps, be able to influence the optimal righting moment, improve autopilot conditions (reliability and reduction of the energy required for AP operation). It should be noted that there will be no gain in maximum speed (still close to 39/40 knots). G18 is an ocean foiler, not a dragster.

G18 still has a year of development ahead of it before the Route du Rhum, which represents quite a challenge.

As mentioned above, the performance gains will not be seen in terms of maximum speed (the 40-knot barrier) but will be evident in the daily averages... certainly 5 knots or more compared to the G17 generation. (5 knots over 24 hours represents 120 more miles, 8 knots almost 200...)

The transformation of **the** other **Ultims** also seems very difficult, if not impossible, to me, firstly for technical reasons because the existing platforms are not adapted to these changes, and secondly because of the financial investment that would be required.

J.S. (14/12/2025)