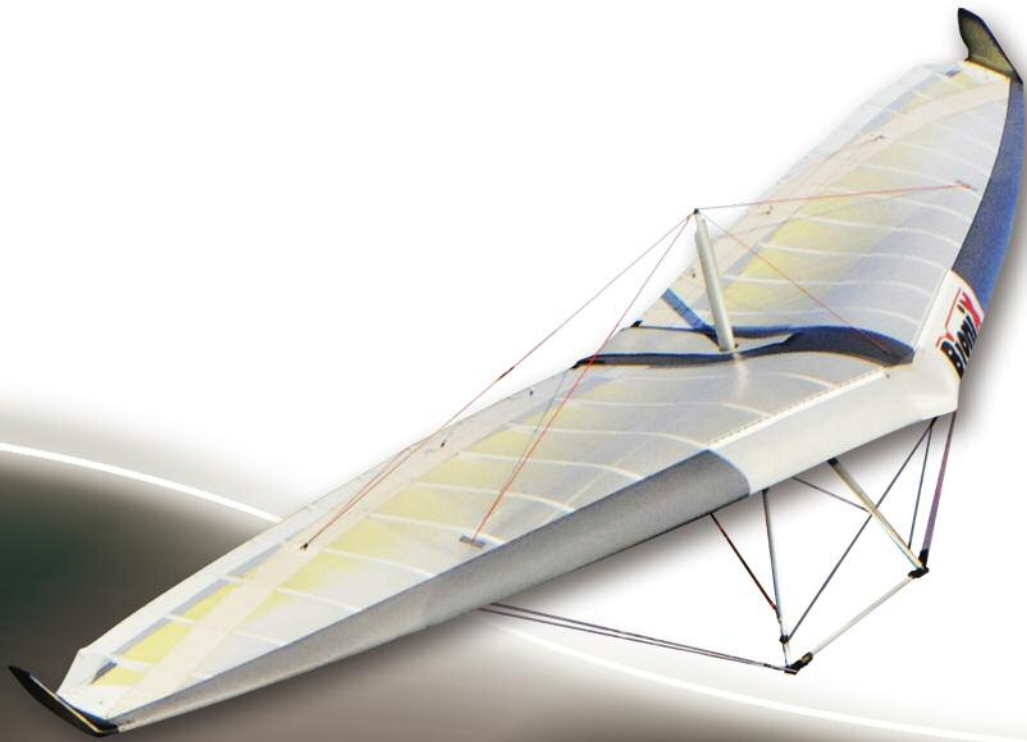


*innovation*

**BioniX**

THE VARIABLE CONFIGURATION WING



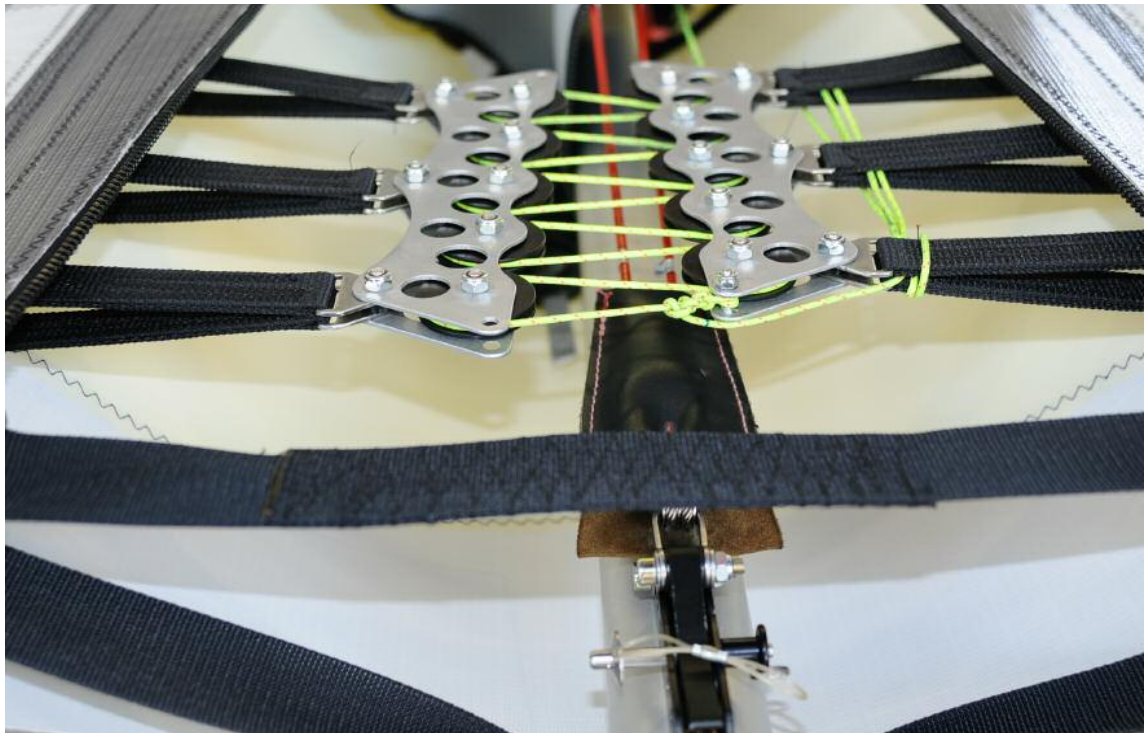
**air création**  
TOUJOURS UN ULM D'AVANCE



## LE CORSET : The current state of technology :

- 1) Responsiveness in roll of flexwings depends on flight speed, sluggish at low speeds, jittery at high speeds. For modern machines with a wide speed range this leads to very poor maneuverability at low speeds that prohibits practical operation, or hypersensitivity to roll at high speeds making control difficult, even dangerous. The published low speeds are theoretical. In practice the fast wings are unable to make slow approaches and to land at a short distance in turbulent conditions (or in case of engine failure).
- 2) The increase in performance has almost universally led to pitch trim systems in order to vary the cruising flight speed. The various systems only affect speed by moving the neutral position of the control bar. Pitch characteristics cannot be optimized for all settings, so it's hard to push the bar at high speed and hard to pull at low speed. Moreover, because of the fixed geometry of the wing (washout, billow, and profile), the performance and handling can only be optimized for one phase of flight, and control is limited at both ends of the speed range.

## LE CORSET : description



The CORSET is a configuration control far in advance of traditional pitch trim systems. It simultaneously adjusts trim speed and changes the form and design of the wing to optimize them for the chosen speed. This system is patented by AIR CREATION.

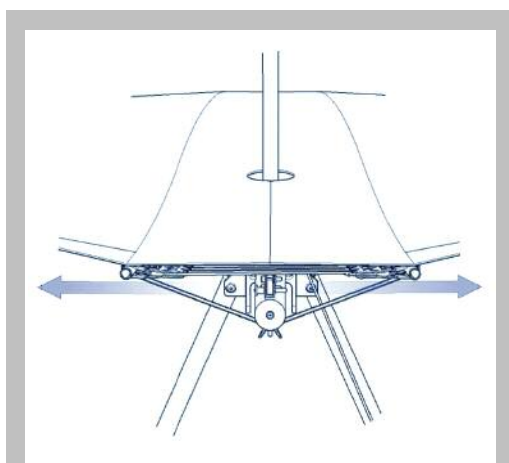
A true regulator of the geometry of the wing, the CORSET acts directly on the tension of the wing to control its form.

It allows you to modify in flight at will the central tension of the rear part of the sail. A winch system exerts lateral traction on the rear half of each side of the wing through two rigid battens attached to the sail, which close as a result of the tension. Strips of Kevlar fabric sewn into the sail transmit this additional tension to the tip of each half of the wing. The apparatus is complemented by straps (and keel pocket) forming a wide V, secured to the battens and the keel, maintaining the shape of the profile behind the kingpost. When the central tension of the fabric is increased, the V is tightened, allowing the center of the trailing edge of the sail to rise, reducing the angle of attack of the profile and increasing its central reflex (see figure below). This is controlled simply by the pilot using a winding handle on the A frame upright working through a low friction system for fast and easy adjustment. Special supple fabric panels enclose the mechanism in the sail giving smooth contour for aerodynamic efficiency and pleasing esthetics.

### **The advantages :**

The CORSET system combines exceptional ease of use and remarkable effectiveness. It allows us to combine in a single control the cruising speed and the adjustment of the geometry of the wing to this speed by acting on the billow ("soft" part of the wing that ensures handling), the twisting and the central profile of the wing. The wing reconfigures itself like those of a bird, which are always perfectly adapted to each phase of its movement.

### **The following transformations are thus obtained :**

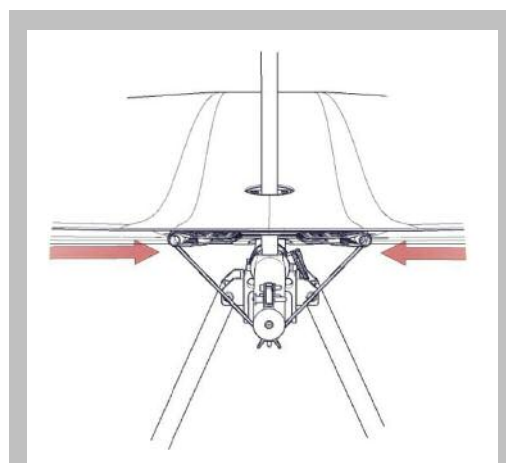


#### **Tension released :**

Increased washout (twist), increased angle of attack of central profile, decreased central reflex, billow increased, center of thrust advanced.

#### **This configuration creates :**

High coefficient of lift, maneuverability in roll, and decreased cruising speed, thus allowing safer maneuvering at low speed and high angles of attack.



#### **Tension increased :**

Reduced washout (twist), decreased angle of attack of central profile, increased central reflex, billow decreased, center of thrust retracted.

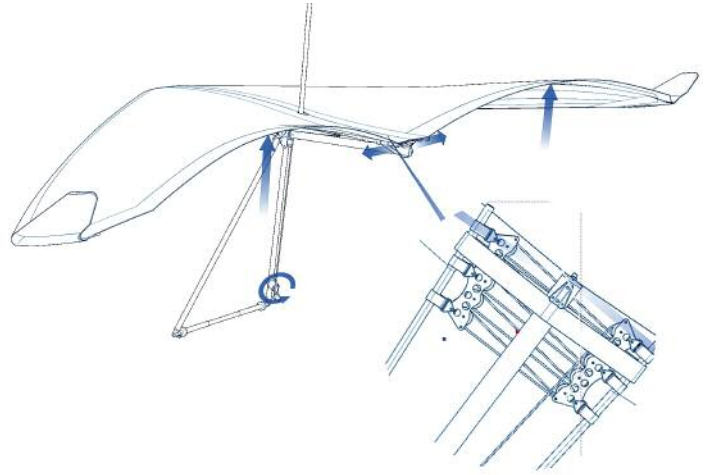
#### **This configuration creates :**

Reduced drag, effortlessness in pitch forces, roll stability, and increased cruising speed.

## LE CORSET en action

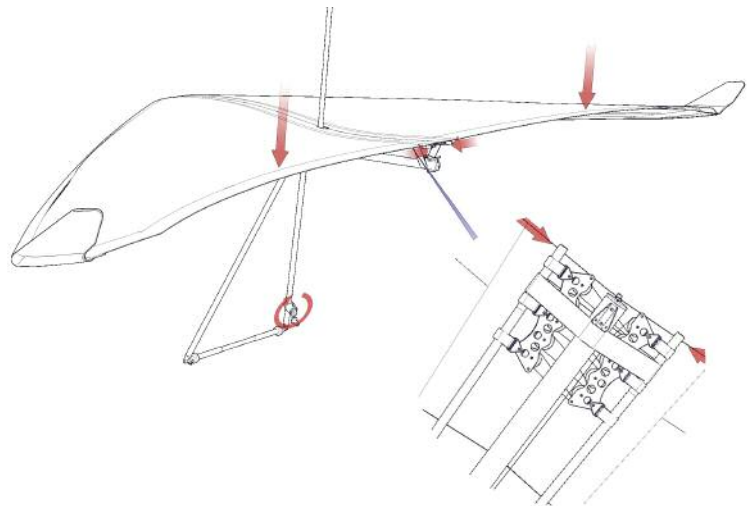
### At slow speeds, approach and landing:

the billow of the wing is very high, allowing for significant differential movements and providing the best handling roll. Suppleness of twisting of the wing tips is also at maximum, the central part of the wing stalls first to ensure safe and predictable handling. The central profile is concave, providing the best ratio of lift and ensuring the lowest possible minimum speed. The increase in the billow and twisting increases drag, which is favorable for steep approaches into confined landing area.



### At high speeds:

the billow is very low, providing perfect stability without roll oscillation. Twisting of the wing tips is minimal, providing the best aerodynamic performance. The central profile is flatter, ensuring the preservation of perfect pitch stability despite the decrease in the twisting of the wing tips. The decrease in the billow and twisting, coupled with the increase in the central reflex profile causes a reduction in drag and therefore increased performance, allowing for greater speeds for a given power (reduced consumption, increased range and maximum speed).



Compared to traditional pitch trim systems the bar position between fast and slow settings moves far less, which improves the ergonomics and security of handling, increasing the usable speed range and shortening takeoff and landing distance.