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THE PERSONAL JET IS BORN #2

Form follows Function

Running up to the first Cirrus SF50 jet delivery in less than one year, our new monthly diary will have members of the development team giving insights on how the only Personal Jet remaining in the market is created

TEXT **Paul Brey**

Back in 2001, the design process for the Vision SF50 started with lead designer Mike Van Staagen applying our core design philosophy to the idea of a Personal Jet. Of course, the natural tendency is to create a business jet similar to what is already in the market, however, that was not the path we intended to follow. We not only wanted to enter the turbine market, we wanted to revolutionize it. The result was the Vision SF50; a jet that was larger and faster than the SR20/22, did not require a professional crew and could still fit in the same standard hangar.

Everyone experiences flight within the cabin. Thus, this was an appropriate starting point for our initial designs. We knew the interior must accommodate five full-size adults with baggage. *Accommodation* has multiple interpretations. To us, it means delivering a premier passenger experience. The interior would need to do more than simply fit five adults; it had to be spacious and versatile with flexible seating configurations and allow for ample head, shoulder and leg room. In addition, the pilot's experience had to be amazing. From perfect ergonomics to spacious headroom in a seat that delivers extraordinary views, we focused heavily on setting a new bar for the pilot experience in the Vision SF50. We accomplished this through a performance car feel, great visibility and an asymmetric panel that places the pilot front and center. All of these attributes lead to an »egg« shaped cabin versus the traditional cylinder found on legacy aircraft.

As the design came together, the team evaluated multiple sources for power and speed. A turbine engine was the answer. Turbine engines are usually found in pairs on business jets or with a propeller on turboprops. Fortunately for us, small

engines were coming of age and options were available with the emergence of the Very Light Jet (VLJ) category of aircraft. We chose the Williams International FJ33 engine, which is a scaled derivative of the FJ44 engine with all the latest technologies. The notion of using just one FJ33 engine was a bold idea. It would give the Vision Jet all the benefits of turbine power and speed in addition to an uncompromised reliability record; and all of that would be at half the cost of typical jets that had dual engines.

Placement of the single engine was the next design challenge. The »backpack« configuration was ideal for design simplicity, ease of access, and FOD avoidance. The engine tilts downward with a slight tailpipe bend to create a lower thrust line, which translates into a nice handling aircraft. The single turbine engine placed atop the cabin is the key visible attribute that separates the Vision SF50 from VLJs, creating its own category: the Personal Jet.

After the cabin shape and engine placement was determined, the next challenge was the tail. A conventional T-tail would interfere with the engine exhaust. Two

other options remained: either an H- or a V-tail. When trying to decide which configuration to use, we benchmarked the UAV industry. The V-tail was utilized in all the popular drone designs, such as the Northrop Grumman Global Hawk, and provides striking aesthetics. These aircraft also needed to be stable because many were photography platforms. It appeared that the modern V-tail was ready. Modern, computer aided aerodynamic design tools and wind tunnel testing allowed the configuration to be well understood and optimized before the aircraft ever flew. The V-shape of the Vision SF50 was born.

Although we began the design for the Vision Jet over a decade ago, we would design it exactly the same if we started today. This aircraft brings our core design philosophies of innovation and premium flight experiences to an entirely new segment of aviation. And in case you are asking yourself where we put the CAPS parachute system without which a Cirrus wouldn't be complete: It sits in the nose of the SF50. But there's enough to tell about that decision to warrant another article. 



Well considered: egg-shaped cabin, single engine on the back and V-tail configuration

PHOTOS: CIRRUS AIRCRAFT