

VICTORIOUS VITO

Swiss Air Racing Team pilot Vito Wyprächtiger scores a victory in the Formula 1 class at the 2013 Reno Air Races

➤ To successfully participate in Reno, USA, a pilot must fly in an aircraft designed using the best flying material and possess outstanding skills, and be a true flying addict. In the 2013 race, Swiss pilot Vito Wyprächtiger won the Formula 1 class and proved that he has all of these things. He even made history by being the first European to win this prestigious trophy in the 50 years of the race. This exceptional accomplishment was achieved after he appeared in the competition for the first time in 2010, when he finished second.

TACTICS AND TECHNOLOGY

On the pylon course at Reno/Stead Airport, clever tactics in close proximity to the ground are required in order to succeed. Vito's triumph over his strong opponents was largely due to his excellent flying skills, but technological improvements on his airplane also played a major role.

The victorious aircraft was Scarlet Screamer, a Cassutt IIMM kit plane, which originally featured plywood wings and a steel tube frame covered with fabric. This simplicity in construction comes at the cost of reduced structural and aerodynamic efficiency. In recent years, successful competitor aircraft have often profited from the technological advantages of composite monocoques and

advanced aerodynamics. In order to overtake its competitors, the Swiss Air Racing Team recognized the need for drastic improvements with similar technology on their base aircraft.

REDESIGNING THE TURTLE DECK

In partnership with RUAG Aviation's aerodynamics department, several options for enhancing the basic performance of the Scarlet Screamer were studied and a step-by-step development plan was put together. The turtle deck was identified as being most promising for short-term improvements. This structure on the upper fuselage essentially comprises the cockpit canopy and its downstream aerodynamic fairing.

The aerodynamicists at RUAG's wind tunnel facility in Emmen, Switzerland, analyzed and finally optimized its shape under the constraints of the rule books. This largely reduced its contribution to the aircraft's overall drag. Integrating the vertical stabilizer into the new turtle deck further helped to optimize the aircraft. Implementing the design in carbon composite provided increased stiffness at a low weight.

NEW COMPOSITE PARTS

With the aerodynamic shape fixed, the structural design and fabrication tools (molds) needed to be completed in

preparation for manufacturing. The turtle deck was then fabricated in the RUAG wind tunnel model workshop.

The RUAG team specializes in prototype components and low production rate parts in support of internal or external wind tunnel tests and flight activities (repair and modification kits for payload integration, for example). The short communication paths within RUAG's aerodynamics department and the sterling efforts of the workshop ensured that the tight delivery schedule was adhered to. Following the integration of the RUAG turtle deck and a new canopy in the USA, test flights confirmed the benefits of the design changes and set the way for Vito's outstanding victory. Preparations for the next race have already begun! ■



ABOVE: The all-new turtle deck before leaving the wind tunnel composite workshop



ABOVE: Swiss Air Racing Team pilot Vito Wyprächtiger with the new Scarlet Screamer at Reno Stead Airport (Photo: Swiss Air Racing Team)

FURTHER INFORMATION
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