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The Introduction to the Modelaircraft World

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A Glider Self-Built to the Scale of 1 : 3

Model flying is a versatile hobby. While some buy nearly finished model planes, others plan, design and build their machines from scratch. In this case the first flight is a very special experience.

Building a Replica of Diana 2
The original glider Diana 2 was designed by Bogumil Beres in co-operation with the Technical University of Warsaw. The plane was a big success from the start and won several international competitions. This persuaded the two experienced model aircraft builders, Richard Oberholzer and Georg Staub from Zürich, Switzerland, to build a replica of this plane in a scale of 1 : 3.

They started by building the fuselage positive. Hard foam segments were glued to a central aluminium tube and machined until the surface was smooth. In the next step, the fuselage mould was built from glass fibre reinforced plastic.

The white fuselage then emerged from this mould. A retractable and well suspended landing gear couldn't be omitted. Such a fuselage weighs about 1500 g which is not bad, considering its size. The builders also shaped the very long transparent cockpit hood. Accurately cut foam segments were used to make the wing, which was then planked with thin sheets of Abachi wood. The wing spar was made from hard foam, woven carbon fibre and approximately 70 metres of carbon fibre rovings. Ailerons and plain flaps were only cut out at the end and flexibly glued on with silicone. The winglets are detachable to make transport easier. A ready-to-fly wing

The two experienced model aircraft builders with the scale gliders DIANA 2

Waiting for good thermal conditions

weights about 1300 g.
The construction of the rudder and horizontal tail unit is the same as that of the wing, but without a spar.

Flying and Control
Three positions for the plain flaps were programmed in the controller which are retrieved via a three-point switch. In the speed and slow flight positions all three flaps follow? but with decreasing outward deflections. When cirling in a thermal current, only the outermost flap acts as an aileron. For take-off and ridge soaring, the middle flap is added as an aileron, but with reduced deflection. Using the crow position quickly reduces speed. The speed range flown to date is between 30 and 250 km/h. When Diana 2 is pulled down from 300 m with a negative plain flap position and raced along the runway at low level she can barely be heard. Subsequently pulling her up appears to be interminable. The machine

performs huge loops and one roll easily follows another. In its landing approach Diana 2 appears to be flying on rails. With the plain flap in a positive position, the final approach is slow and steady and excess altitude is efficiently reduced without speed increase using the butterfly position.

The two builders have invested a huge effort in their beautiful glider, but every flight makes up anew for the many hundreds of hours spent on developing and building Diana 2.

Technical Specifications of Diana 2, Scale 1:3

Length	2294 mm
Span	5000 mm
Root depth	241 mm
Wing tip edge	67 mm
Wing area	94 dm^2
Weight	6700 g
Ballasted weight	9400 g