Carl Goldberg's Valkyrie

John Hunton

In 1936 Mr. Carl Goldberg began designing a new free flight model, later to become known as the Valkyrie. Performance during test flights was encouraging.

Goldberg took the Valkyrie to the 1937 Nationals in Detroit. The Valkyrie was timed at 53 minutes, good enough for second place at the Nats, but during this timed flight the model flew out of sight into Canada, never to be found again.

Fortunately, Goldberg published a two-part article on the Valkyrie in Air Trails magazine with adequate information for building another one.

Friend and fellow modeler Paul Sprieregen found some photos of framework of the Valkyrie on Pinterest and sent them to me. The intricate fillagree of the Valkyrie framework inspired me to send to AMA for a set of plans.

The plans were a surprise to me showing a graceful model with a huge 10-foot wingspan. There were many wonderful surprises in the two long rolls of plans, the first of which was inclusion of Goldberg's Air Trails article, which included instructions for building the monster. Also shown is a "Space Frame" structure within the center section of the wing to add rigidity.

It must be noted that the "space frame" architectural structure was not officially invented until 1943 by a German engineer, yet Goldberg had used it on this 1936 model.

A space frame consists of interlocking triangular members which create cojoined tetrahedrons. This structure resists forces in bending and torsion in any axis or in any direction. An excellent example of usage of the space frame in architecture is at the main entrance to the Udvar Hazy museum at Dulles where it serves as a canopy.

Construction of this Valkyrie has begun with assembly of the built-up ribs required for all flight surfaces including the wing, fin, stab, and pylon, nearly 100 ribs in all. It proved later that many of the ribs had not been accurately detailed and some had to be re-made.

So how does one build a 10-foot wing in limited space? I chose to build it in 18-inch sections and made up a jig to hold nine ribs at two inch spacing. Then the spars were added to the suspended wing ribs. This jig worked well for the wings and stab.

An amazing fact about the Valkyrie wing is that, except for the leading and trailing edges, It is built entirely of 1/8-inch square Balsa sticks including the wing ribs. Even the spars are 1/8-inch square (I substituted 1/8-inch square Birch for the major spars). These 1/8-inch square structural members span only two inches in Goldberg's magnificent structure and are therefore in compliance with the Euler formula for slenderness ratio.

So far, all wing and stab sections have been basically built up but not assembled. The problem with completing these sections is how to do the trailing edges. The TE's are curved and my attempts to curve them failed so I will laminate the TE's. The fuselage is built-up on a full length nearly 6-foot-long crutch which has been built.

In searching Ebay for a suitable motor for the project I came upon a couple of used ignition style Atwood Champion motors for very good prices and got both of them. I thought we had to have the smell of gas and castor oil around this model. Both motors are in excellent condition but need to have mufflers adapted. We'll see if retarding or advancing the ignition will serve as throttle control.

These engines are unusual in design. Atwood was a respected designer, contributing to the design of early Cox engines and many of his own. These big Atwood motors have BOTH front and rear crankcase induction. Unique.