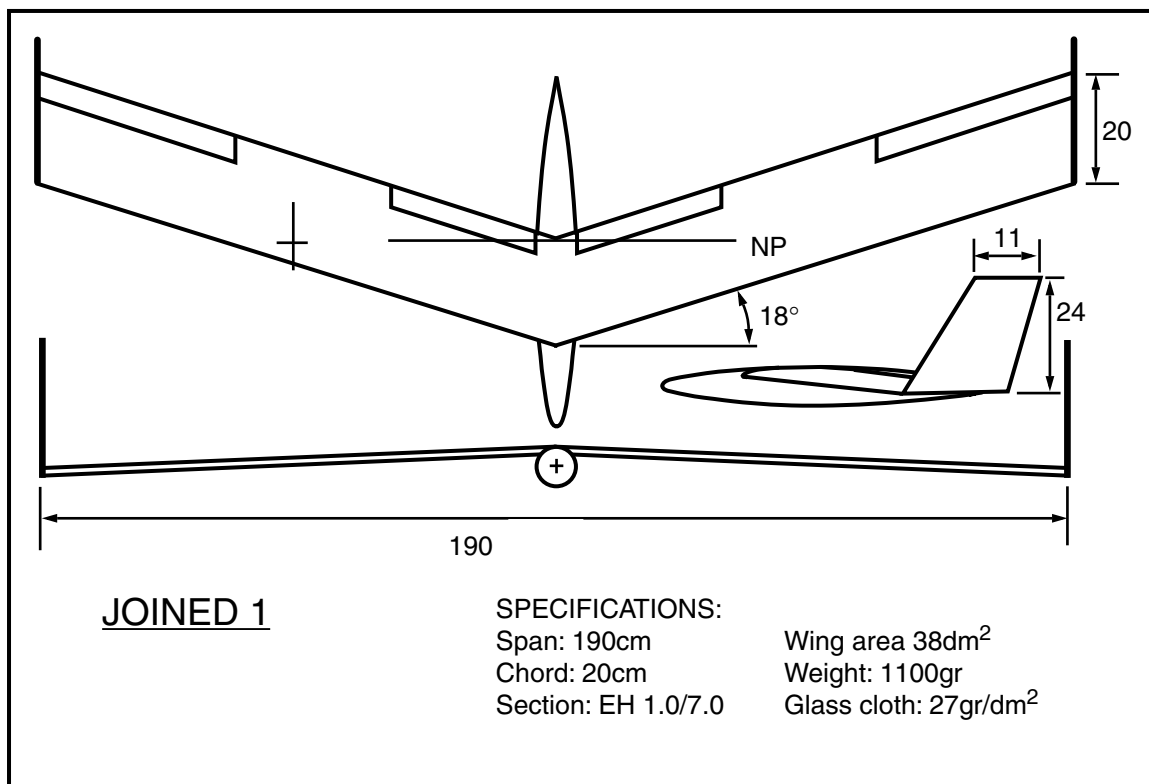


“Joined 1,” a super fast 'wing, and some thoughts on airfoil thickness

Here's a super fast 'wing from Germany, the “Joined 1” by Hans Jürgen Unverferth. This relatively small tailless design, piloted by Peter Kowalski, flew through a measured 200 meter course in under three seconds — a speed of over 150 miles per hour. “Joined 1” uses the EH 1.0/7.0, which is essentially a thinned down version of the EH 1.0/9.0 section.

There is now a move by designers of conventional tailed aircraft to utilize thinner wing sections. Two advantages can usually be derived from going to a thinner section: lower drag and less weight. Drag is lowered because there is less frontal area, while weight decreases because less material is required to construct the wing. This latter point is especially important during the construction of outboard wing panels, as any additional mass in that area translates into inertia which inhibits roll response.

Using a thin airfoil on a tailless planform does not necessarily yield such positive results, however.



- While drag may indeed be lowered by using a thinner section, tailless planforms are inherently faster than their tailed counterparts from the outset. "Joined 1," with its near record breaking performance, uses a section which is 7% thick.
- There are also structural considerations. Swept wings need both stiffness in the span-wise direction and torsional rigidity. These two goals are better accomplished with a thicker section because torsional rigidity is increased as the wing section becomes deeper, and rigidity along the span is a function of spar height.

These two points should get you to thinking about the appropriateness of a 9% section for a tailless thermal soarer. A 10% or 12% section, with 2% to 3% camber, may give superior thermal performance and provide a wider speed range. A thicker section will be better able to provide the strength needed for winch launching, yet high speed travel between thermals should not be adversely affected to any great degree.

Information from *Silent Flight*, Dave Jones Editor, Spring 1992, and personal correspondence with Dave Jones.