

A Comparison of Two Tailless RC-HLGs

We recently received a packet of information from Andrew MacDonald, our Australian correspondent, in which was contained information on Hans-Jürgen Unverferth's latest creation, a tailless RC-HLG. At about the same time, Herk Stokely sent us photos and basic planform measurements for his latest RC-HLG, which is tailless as well.

As both of these aircraft were designed and built within roughly the same time-frames, we thought *RCSD* readers would like to see a comparison of the two gliders.

We'll start with Herk Stokely's creation. Herk's 'ship has a tapered wing and eight degrees of washout. The relatively large amount of washout is dictated by the airfoils used, a thinned SD 7037 at the root and a thinned SD 8020 at the tip. Pitching moment is determined by camber line shape and not by thickness, and it takes a lot of twist to overcome the strong negative pitching moment of the SD 7037.

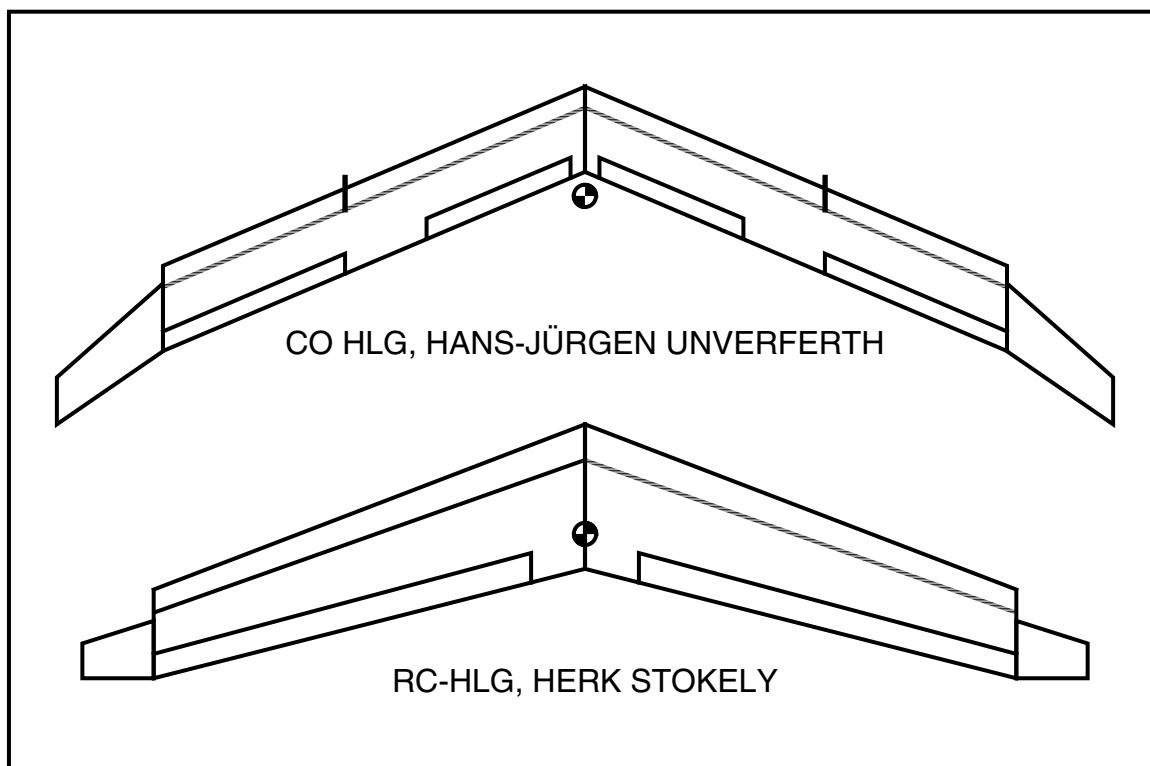
Hans-Jürgen's design, in contrast, utilizes a constant chord wing and four degrees of washout. The airfoil used, which bears the designation RS004A, is essentially a slightly thinned version of the RS001 described in a previous column. The pitching moment of the RS004A is not so large as the SD 7037. The CO HLG also uses flaps. This option allows slower speeds, very tight turns, and exceptional control during landing approaches.

The pictures of Herk's design in the February 1997 issue of *Flying Models* magazine show some very light carbon fiber reinforcement, specifically on the upper surface. There is also a carbon fiber arrow shaft spar system. Two servos are used. The CO HLG, on the other hand, has spars with carbon fiber caps, and the wing itself is of high density foam. This design uses four servos — two in each wing. These factors dramatically influence weight and wing loading, so while Herk's design is very light and has a wing loading under four ounces per square foot, Hans-Jürgen's CO HLG is heavier and, with less wing area, it's wing loading turns out to be more than double that of Herk's.

Herk has been throwing and high-starting his 'wing, while Hans-Jürgen has been throwing and winching his into the air.

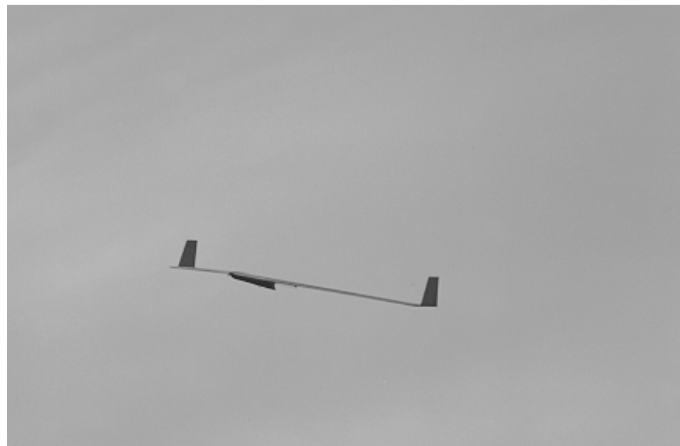
Herk is very pleased with his RC-HLG design. It is stable, capable of being flown by near-novice pilots, and competitive with conventional tailed designs in the contest environment. Hans-Jürgen is very happy with his CO HLG, also. It exhibits good dead air time from a hand launch (50 secs.), and the flaps greatly expand the speed range and help with precision landings. Wing fences help maintain aileron control, and turns are said to be incredibly tight with this machine. The report we received from Andrew indicated Hans-Jürgen had been flying only the CO HLG for the last five weeks, and he is now seriously considering a second construction with a Speed 400 motor installed! CO HLG appears in the January 1997 issue of *Aufwind*, the German aeromodelling magazine devoted to sailplanes.

An included table details the dimensions of the models and shows the similarities and differences of these two designs. We hope this information is of interest and use to *RCSD* readers planning to design, construct, and fly their own tailless RC-HLG.



A Comparison of Two Tailless RC-HLGs

DIMENSION	DESIGNER	
	Herk Stokely	Hans-Jürgen Unverferth
Span	60", 1524mm	58.5", 1485mm
Chord, root	10", 254mm	6", 153mm
Airfoil, root	SD 7037 (7.5%)	RS004A (9%)
Chord, tip	6", 152mm	6", 153mm
Airfoil, tip	SD 8020 (6%)	RS004A (9%)
Sweep angle	22.5° at LE, 20.85° at $c_{0.25}$	24.9 degrees
Wing area	480 in ² , 30.97 dm ²	351 in ² , 22.645 dm ²
Washout	8 degrees, linear	4 degrees, from half semi-span
CG location	7.7", 195mm, behind apex	7.7", 195mm, behind apex
Elevon size (l, w _r , w _t)	26", 2", 1.7" 660.4mm, 51mm, 43mm	12.5", 1.2", 1.2" 317.5mm, 30mm, 30mm
Flap size (l, w _r , w _t)	flaps not used	7.7", 1.2", 1.2" 195mm, 30mm, 30mm
Fin size (h, w _r , w _t , sweep)	5", 4", 2.5", 1.5" 127mm, 102mm, 63.5mm, 38mm	7.3", 4.7", 3.15", 5" 185mm, 120mm, 80mm, 126mm
Construction, wing	foam and fiberglass, with CF arrow shaft spar	foam and fiberglass, with 7mm x 1mm CF spar system
Construction, winglets	1/16" balsa sheet	unknown; could be made of balsa sheet
Weight	11.8oz., 334.5g	17.6oz, 500g
Wing loading	3.54 oz/ft ² , 10.8g/dm ²	7.22oz/ft ² , 22.1g/dm ²
Battery type	125mah	500mah
Controls	elevons only	elevons and flaps
Notes	Extremely easy to fly; has very good performance	Uses wing fences and flaps; is capable of very tight turns



Herk Stokely's RC-HLG