

Hartmut Siegmann's HS 3,0/9,0 and HS 3,4/12,0

The July 1992 issue of *Flug- und Modelltechnik* featured an article by Hartmut Siegmann which described a relatively light weight swept wing tailless design. Mr. Siegmann's goal was to construct an easily transported model which would be able to perform well in both light winds and, with a change of airfoil, flat land thermals.

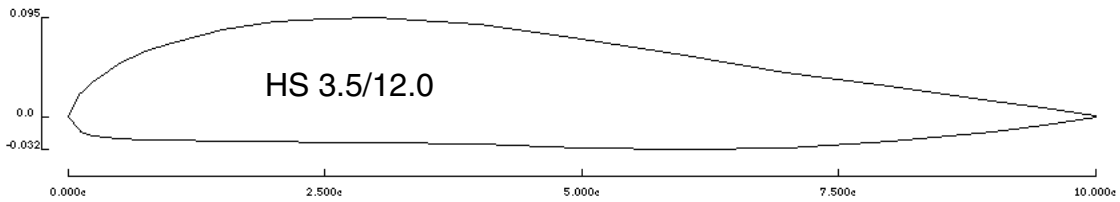
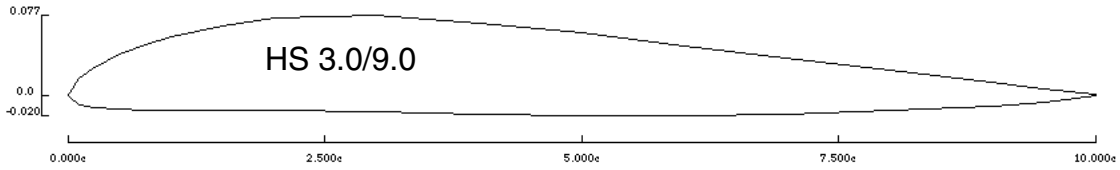
The result of Mr. Siegmann's work is a constant chord 'wing of 20 cm chord (about eight inches) and 1.5 meter wing span. For slope flying, a 3% section of 9% thickness is used. This gives sufficient lift with the minimum drag necessary for good penetration. A 12% thick 3.4% camber section is used for thermal flying. Twenty degrees of sweep and a moderate amount of twist is all that's needed to provide stability.

The airframe is built of foam and balsa, while paper packing tape serves as the covering material. (Thin balsa sheeting could be used if a more robust structure is desired.) An aluminum tube serves as the wing joiner, and winglets are glued on with five minute epoxy. A streamlined fuselage of sheet balsa completes the 'ship. This is a simple structure which is capable of very good performance. Mr. Siegmann's article included pictures of the completed model flying over the North Sea and in the Alps.

Coordinates for the HS 3,0/9,0 and HS 3,4/12,0 profiles were given in the article. We immediately entered this data into our plotting program, but the HS 3,0/9,0 which was produced showed some obvious flat spots when compared to the HS 3,4/12,0 contour. Some minor manipulations smoothed the profile nicely, and the resulting coordinates for both sections are printed here.

The accompanying chart gives the information you'll need to utilize these sections in your own design.

Section	Camber	Thickness	Zero Lift Angle, $\alpha_{l=0}$	Pitching Moment, C_m
HS 3,0/9,0	3.03%	9.37%	-1.21°	0.00095
HS 3,4/12,0	3.51%	12.02%	-1.26°	0.00001



HS 3.0/9.0

HS 3.5/12.0

100.000 0.100
 95.000 0.640
 90.000 1.240
 80.000 2.443
 70.000 3.624
 60.000 4.750
 50.000 5.975
 40.000 7.000
 30.000 7.685
 20.000 7.425
 15.000 6.753
 10.000 5.627
 7.500 4.900
 5.000 3.925
 2.500 2.685
 1.250 1.770
 0.000 0.000
 1.250 -0.975
 2.500 -1.175
 5.000 -1.335
 7.500 -1.430
 10.000 -1.475
 15.000 -1.500
 20.000 -1.540
 30.000 -1.685
 40.000 -1.900
 50.000 -2.000
 60.000 -2.000
 70.000 -1.875
 80.000 -1.520
 90.000 -1.040
 95.000 -0.650
 100.000 -0.100

100.000 0.100
 95.000 0.812
 90.000 1.475
 80.000 2.870
 70.000 4.250
 60.000 5.902
 50.000 7.516
 40.000 8.901
 30.000 9.500
 25.000 9.415
 20.000 9.099
 15.000 8.380
 10.000 7.120
 7.500 6.271
 5.000 5.140
 2.500 3.500
 1.250 2.330
 0.000 0.000
 1.250 -1.450
 2.500 -1.890
 5.000 -2.106
 7.500 -2.229
 10.000 -2.299
 15.000 -2.390
 20.000 -2.410
 25.000 -2.498
 30.000 -2.500
 40.000 -2.700
 50.000 -3.085
 60.000 -3.220
 70.000 -3.061
 80.000 -2.392
 90.000 -1.450
 95.000 -0.811
 100.000 -0.100