Those EH Sections Again!

Over the last few weeks we've received a number of requests from readers of this column, and visitors to our web site, for airfoil recommendations. Here's a partial list of the specific cases:

- A delta planform used for slope flying is currently using a symmetrical airfoil, but performance in light lift leaves something to be desired. What airfoil should be used to improve light lift performance, while retaining the near zero pitching moment of the symmetrical section currently being used?
- A PSS Me-163 "Komet" with a conventional cambered airfoil requires several degrees of twist to provide stability. Removal of wing twist would improve performance and allow a more realistic appearance. Is there an airfoil available which will allow this?
- A swept wing planform of roughly two meter wing span is to be used for thermal soaring. The performance must be rather docile, as the resulting 'ship will be used as a tailless trainer. What airfoil will provide good stall characteristics and a stable platform?
- A high performance swept wing tailless glider for the 60 inch slope racing class is being designed. The designer is looking for a low drag section which will require very little twist for stability. No airfoil had been chosen when this request was received.

It was no surprise to us that we were able to recommend one of the EH airfoils for each of these applications.

In the first case, the delta, any of the EH sections can be used as nearly a direct replacement for the symmetrical section. This is because all of the EH sections have pitching moments very near zero. As cambered sections, however, they are capable of producing substantially more lift than the symmetrical sections they replace. Substituting a cambered EH section for the symmetrical section would improve light lift performance.

For the ME-163 "Komet," which could benefit from a reduction in wing twist, the EH sections again are useful. Using a section with a lower pitching moment and a smaller zero lift angle would allow removal of nearly all of the wing twist while still maintaining a good degree of stability.

In the third case, the swept wing tailless trainer, the EH sections are an attractive choice because of their excellent stall characteristics. A larger than usual amount of twist might be useful in this instance as it would allow the CG to be placed somewhat further forward, making a more stable platform.

Lastly, for the slope racing enthusiast, the low drag EH sections can be thinned to a moderate degree for further drag reduction without fear of losing the positive characteristics outlined above. The EH 1.0/7.0, a thinned version of the EH 1.0/9.0, was used with great success on the "Joined 1," the near record breaking model described in the April 1996 issue of *RCSD*. It serves as an example of what can be done in this regard.

Coordinates for the various EH sections have been printed within the pages of *RCSD*. The EH 1.0/9.0, 1.5/9.0, and 2.0/10.0 were covered in the November 1990 issue, the EH 2.0/12.0 and 3.0/12.0 in the December 1992 issue. Both of these columns are available in "On the 'Wing... the book." Information on the EH 0.0/9.0 was published in the January 1996 issue, and is available elsewhere in this book. Coordinates for all of the EH sections mentioned in this column are also available on our web site at <http://www.halcyon.com/bsquared/EH.html>. Coordinate tables, regardless of the source, always include the pitching moment and zero lift angle for the described section. These two aerodynamic characteristics are needed when designing a tailless planform by means of the Panknin code.

With all of their positive characteristics, the EH sections have proven themselves to be excellent choices for many tailless applications. Despite new airfoils appearing on the scene, the EH sections will be attractive alternatives for tailless aircraft designers for a very long time.