

NO-CAL - A Path Less Taken

A Hanging Tail, by Glen Simperts

As my poor NoCal quivered in the wind on the stooge at Kudzu last spring, I thought there had to be a better way. This winning P-40 was later smashed to bits on retrieval at Geneseo. I had struggled with wind and NoCals before. Nocal tend to have an indoor design philosophy. I had settled on a formula more akin to my other FAC models. Build any part that failed a bit stronger, adding weight and then add more power. Use a large diameter propeller to absorb power efficiently and try to power the airplane as long as possible. It has a large standoff from the motor stick and can run a big heavy long motor. It flied like a dump truck. As nocal do not have a maximum time, to win catching a thermal is a real benefit. Maybe I needed to take a different path for windy weather to make a model that is both structurally robust and thermals better. My typical wing in wind would break at the leading or trailing edge. Adding a spar didn't help all that much since it would buckle without adding more ribs.

To create a wild weather nocal I decided to cover the bottom of the wing. The covering with Esaki tissue on the bottom added .5 g. to the weight. The two tissue surfaces carry a lot ofload through the tissue, stabilizes the rib positions, and makes a spar work for you. The wing that resulted was significantly stiffer. Since this model is a bit heavier, maybe you need a different light model for those contest days when butterflies dance.

A second change was running a smaller diameter higher pitch prop instead of the biggest prop that could be fitted. Once the prop freewheels the smaller prop would have less drag - the better to thermal.

A third adjustment was to run a shorter motor stick centered on the center of gravity. Since some parts of the model are now heavier I didn't want lots of weight towards the tail. Changes in motor weight made at the field could be done without needing to worry about ballast. This move would decrease the moment of inertia in pitch allowing the model to be more responsive in that axis.

For years I flew javelin-launched hand launched gliders. My design that worked best for me was one in which the dihedral was minimal on a high aspect ratio wing coupled with a small vertical stabilizer. Trimmed for a left hand glide, such a glider would have a tendency to open up the glide circle or even fly to the right in the presence of a thermal off to one side. lance had a nocal that acted exactly in that way. With the right sized prop, a smaller vertical, and appropriate dihedral it was stable but sensitive. It drove the control freak in me crazy but the circle to the left was a suggestion during the glide. It was stable with neither dutch roll nor spiral instability but it would wander across the sky in any sort of bouncy air. In calm air it had a nicely defined circle. It flew left, flew right, or flew straight if it had the mind. In one epic flight it flew from one weak thermal to another, joined with a thermaling butterfly, and then flew away to live with the unicorns. I've been in search of such a mythical airplane ever since, so I combined all these features—reduced dihedral angle, small vertical tail size, small prop-v-on a P-47 nocal, in hope of recreating that unusual aircraft. Maybe not the easiest to build design but one for which I had templates on hand for laminated outlines. Plus I could directly compare the new approach with the flights of a long lost predecessor P-47 Nocal (see Max Fax 5/99).