

# VERTICAL TAIL CONSIDERATIONS

by Don Deloach

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Dang that fin extension!

I have a Corsair of about 22-3/4" span that weighs 39 grams empty. It is detailed in the F AC News article and was the FAC Nats winner last year. (*WWII Combat mass launch - Ed.*) It is honestly the best flying low wing model I've ever had, with TVo of 0.65 and, after a lot of hand wringing, a 100% scale vertical tail (I photo enlarged it directly from a three view). If anything, the model is just a tad spirally unstable, exhibiting a mild dutch roll at times. Otherwise it is very stable in all axes, climbs and glides well and does 100-120 seconds on full torque (5.5 in/ounces), despite its rather portly weight.

Now, as many of our clubster friends know, vertical stab effectiveness is force-balanced by wing dihedral and prop diameter. So ... reduce wing dihedral and/or prop diameter and you are making the vertical stab more effective. So with a smaller prop of, say 8" diameter, this Corsair might well need the fin cut down a bit. That is just a guess on my part; I see no reason to ever go lower than 40% on my prop diameters.

I build and fly a lot of scale and can say almost without exception that the "fin-is-too-big" mantra is generally a myth. This assumes that you are putting plenty of wing dihedral in (never more than the FAC rules allow of course--they are very generous IMO) and using a prop diameter of 35-40% of wingspan. And my TVos are always at least 0.60 on monoplanes and 0.40 on bipes.

Two cases in point: I recently built a Tom Nallen 22" Bearcat from his '96 plan and a stock Golden Age kit 24" P-47. Both used 40% carved props and had wingtips near the bottom of the canopy, and both needed about 1/4" acetate slivers added to the tops of the fins. Then (and only then) did they trim out easily.

The Bearcat as we all know has a really tall fin ... but it obviously was not tall enough for FF, which really surprised me. I built my fin per the Nallen plan which looked to be 100% scale to me. After the fin heightening and barely five test flights the thing flew great! It now rivals my Corsair as my best flying, easiest-to-trim low wing. It did 120,118 and 91 seconds in its first contest (WESTFAC IV) this Spring.

Trimming the Jug was surprisingly difficult. At first it would do a nasty crab/knife edge, hanging on the prop with the left wingtip low. This was the weirdest trim condition I've ever had to solve. After a couple of close calls over our parched Colorado prairie "grass" (what tall grass?--we are tough out West) I tried heightening the fin. Voila! The slight heightening did the trick immediately, brought the wingtip up and the nose lower for a smooth, efficient climb.

WESTFAC IV was also the P-47's debut. I built it in French markings for the special MTO combat event. I wound it for the first round, it hooked a thermal and ... eight minutes later it disappeared, still climbing in a beautiful glide circle, headed for Tijuana. One month to build, one contest, one official flight.