

BILL HENN'S SCALE PROPELLER

By Bill Henn

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Windy Sock Editor's Note: Bill lets us in on more of his winning model philosophy. Here he tells us that he has fixed his sights on a successful motor and prop combination and chooses models that fit, the very opposite of the process most of us go through, i.e., we build the model that suits our heart first and then grope around for the right prop/motor combination. We have heard other successful modelers tell of using the Bill Henn approach as well. Your editor has often convinced himself that he should concentrate on one area in a like manner but I then proceed to violate that intention, giving in to variety of designs to spice his life - and suffering through the infinite choices of prop and motor, crash by crash. Maybe Bill Henn has something here for all of us.

"Ever since I began to fly free-flight scale, more than 30 years ago, I have been experimenting with various propeller pitches. About five years ago I settled in on this design and now scale it up or down for use on all models. It seems to work well using the 15% motor weight rule used in the NE as well as with unlimited motor weights. It should be realized that the subjects I choose to model have rather clean lines and I avoid draggy models such as biplanes. However, I believe this prop would work well on them also. Notice that the pitch diminishes from 60% radius* to the tip. This is in concert with the props such as the Andrukirov which have become the standard with FIB and FIG flyers. Few use helical pitch any more. I have noticed that the diameter of the props used on many scale models is too small for optimum performance. The old rule that the diameter of the prop should equal 1/3 of the wingspan is greatly flawed. There are some equations for calculating prop diameter that may be very useful but I have never used them and simply go with about +/- 40% of the wingspan depending on the area. I generally start with 40% of the wingspan. If the subject has a slim, high aspect ratio wing such as the FW 152H, I reduce the prop size to about 35%. With subjects that have broad, low aspect ratio wings, prop size is increased to more than 40%, as with my Chambermaid P-Nuts and 22" wingspan versions. Both use props that have a diameter of 45% of the wingspan. The best prop is not going to work unless it is hitched to the right motor. There must be a means to calculate the number, width and length of the strands for optimum performance, but I have always used the trial-and-error method. With the 10" diameter propeller, six strands of 1/8" rubber works out quite well. With long-nosed subjects, a motor that weighs 40%-50% of the weight of the model can be used without having to add an amount of ballast which will raise the wing loading excessively. To simplify matters I generally design and build my models to a size and weight to accommodate the 10" prop and six strand motor. This combination is used in my twins as well as my single-engined projects.

*(Editor's note: The "60%" radius" above refers to the 3" radius on a 10" prop. In the graph below, The "10" width" is the width of the block for the 10" prop, and the "10" depth" is the block depth on the 10" prop.)

