

ENLARGING 3-VIEWS TO PLAN SIZE

by Bill Henn

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PFFT Ed. Note: Although this discussion was in a FAC newsletter, the problem discussed is universal. Try enlarging a small plan on a copy machine and you'll quickly find out.

In recent years, all my models have been scratch built, usually original designs from my own plans. Since my computer and drafting skills are rather limited, drawing plans for large models has been very tedious and time consuming, especially when using a small 3-view for reference. Anyone who has ever attempted to enlarge a small line drawing on a copy machine has experienced the problem with the thickness of the lines increasing proportionately as to the factor of enlargement. With a really large model, such as a Jumbo or Giant Scale subject, the lines become blurred to the point of uselessness.

When drawing the plans for some of my most recent projects, I hit upon a very simple method of increasing the size of a 3-view substantially using an ordinary copy machine without losing the definition of the outline. All you have to do is to use a Sharpie or similar marking pen and fill in the outlines of the entire drawing with black ink. Care must be used to keep the outlines sharp because every slip will be amplified upon enlargement.

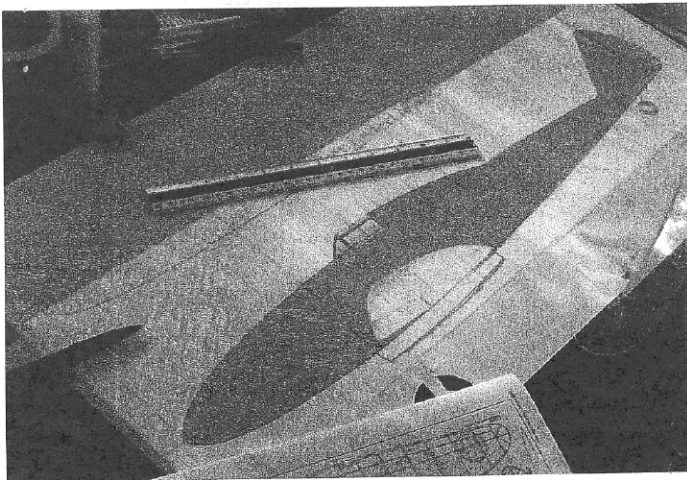
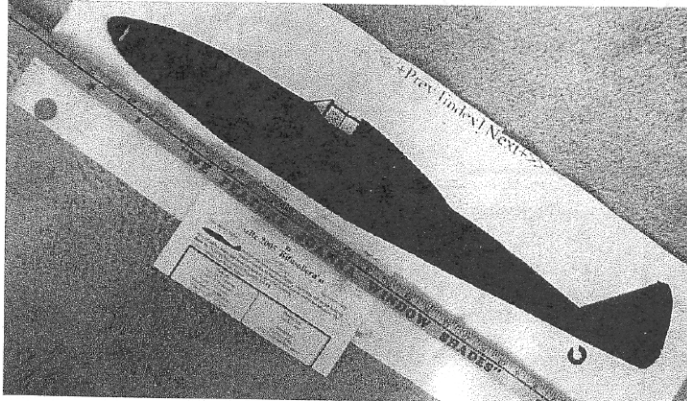
After the entire 3-view drawing is blackened, the drawing can be enlarged in stages, using 200% for the first few blow-ups and lesser amounts as you approach the desired size. The copy machine you use should be capable of handling 11" x 17" paper. It will be helpful to bring along a tape measure and calculator to determine exact percentages of enlargement as you work towards the final product. To make the outline for the plans of my new 43" span Reggiane Bifusoliero, only 4 stages of enlargement were necessary with an expenditure of merely a few bucks for the copies.

As soon as the outline of the 3-view has been enlarged to the desired size and the sheets glued together, it can be traced over on a piece of vellum. Once this outline is completed, it will be easy to draw in the framework. The formers should be spaced off on the side and top views of the fuselage and each dimension transferred to graph paper, forming rectangles. At this point it is easy to draw in the outline of the formers freehand with reasonable accuracy even for complex contours.

The first photograph shows the side-view that I prepared from a tiny 3-view in order to draw up the eventual fuselage structure of my Reggiane Bifusoliero model. Note the good definition obtained using my simple Sharpie pen technique. Doesn't get any easier than that, and it's applicable to all types of models, from full-scale jobs to nicals.

The second photo shows the full-size fuselage plan being drawn up on Vellum. Note how the cockpit area has been developed and the wing position established. As you can see, I use simple

drafting tools such as rulers and French curves to do the job.



The only other part of the plan that will require particular care are the wing ribs. No problem with a constant chord wing, but this can be time consuming with a tapered wing. If you use the same airfoil as I do on all my scale models, making the outlines for the ribs is very simple. A few years ago I purchased the book "Book of Airfoils" by Ed Dolby from FAI Model Supply. This book contains full page drawings in various sizes of 78 popular wing and stab cross-sections. One page is devoted to 10 drawings of the section I use, the Neelmeyer, in graduated sizes from 3.5" to 8". Taking the book to a copy shop, I printed a bunch of copies in various sizes ranging from - 2% to - 10% and + 2% to + 10%. This gave me a range of sizes that would suit almost any subject that I choose to build.

After drawing the wing outline of a new model, a pair of dividers can be used to select the proper size rib for each station. Next, carefully cut out all the ribs from the bond paper that they have been copied on with scissors and use 3M Poster Glue Stick to affix them on the balsa sheet(s) that will be used for the ribs. The very same process can be used for the formers as well. After these parts have been cut from the wood, the paper outlines can be easily removed from them. Using the 3M product, no residue is left on the wood. Hopefully, this article will encourage you to try your own hand at drawing up a plan for that secret project you've been thinking about for such a long time. Give it a go, it's not as hard as you may think!