

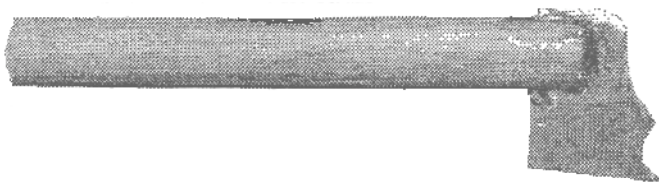
## Building a Guillow's Kit to Fly

*The following is an article by John Robison, published in the May-June 2001 issue of MaxFax, the Journal of the Washington, D.C. Maxcutters, Stew Meyers, Editor*

*Ed. Note: This particular issue of the MaxFax dealt with Guillow's WW2 Models, and John's article provides some interesting insight into salvaging these nearly impossible to fly kits.*

Who hasn't marveled at the beautiful detail and accuracy of the Guillow's WW2 models? Unfortunately, dreams come crashing to earth quickly for those trying to get a good flying model by faithfully following the instructions. If only these flew off the board like Comet dime scale! I've been building these for a long time and have quite a collection of salvaged canopies and cowls from doomed aircraft. However, I'm here to tell you that it can be done and that if built using the following techniques you can also avoid a lot of crash damage as well. You will have the thrill of accomplishment when you see your scale model actually fly a decent length of time — it makes it all worth it!

Step one: Throw away the wood. I think it is made out of ironwood, not balsa. Go for stronger wood on the leading edges and lighter wood on the trailing edges. Then you've got to scour the innermost recesses of your mind to figure out how to reduce the weight of wooden parts even further. Make every other former and rib out of 1/32. On the remaining ones of 1/16, use light wood. Is it really necessary to have 3/8 inch wide wood for the trailing edge? Let's go for 1/16 or slightly larger. Hinoki for the wing tips and rudder outlines, etc. (Ed. Note: Hinoki wood seems to be longer found in this country) The fuselage formers should not only be thinner and lighter wood, but should also have the insides carved away . . . they don't need to be 1/2 an inch. Stronger heavier stringers help up front on the fuselage for impact damage resistance, and lighter stringers behind the motor mount keeps mass way down in back. This not only makes it so you don't have to load up weight up front (in fact I often have to put weight on the tail a little), but also helps the tail surfaces respond quickly to changes when necessary to pull out of stalls etc. I like to use wire landing gear that plugs into aluminum tubes so you can fly wheels up if you want. Wheels themselves can be made out of foam with aluminum tube bushing.



I've got a couple of homemade tools I use for making foam wheels. You take some sheet aluminum and epoxy it into a dowel. Using a moto-tool I grind the aluminum until it is a cross-section of a wheel from the axle out to the edge of the wheel. Chuck it into a drill press and very slowly lower it into a piece of foam. Voila! Instant half a wheel! May as well whip out a bunch of them as long as you are set up. Then cut out the half wheels and glue 2 halves together to make a full wheel. Of course, use glue that won't destroy the foam, such as Elmer's. Drill a teensy pilot hole and bush with an aluminum tube. Better scuff up the outside of the tube to give the glue something to adhere to. Sometimes I like to use a hot metal file to create a tile tread appearance on the wheel. For those with access to a great vacu-form machine such as the \$70 Cross Hobby model, you can mold some plastic over a hardwood wheel to make half a wheel. If you like you

can glue 2 halves together for a full wheel, or simply use a half wheel for reduced weight. Axle can be an aluminum tube lightly epoxied on both sides of the wheel. Don't get any epoxy in the holes! Better use your reading glasses, except you young whippersnappers. Turns out that one of these wheels is about 10% of the weight of a hardwood wheel. Goal: reduce weight, have landing gear that won't break off, and have wheel up, wheel down versatility. Yes, they add weight and drag, but you can't get neater looking than a focke-wulf flying wheels down!

A hair extra dihedral might not be a bad idea. 1/4 inch on each side adds some stability and is barely even noticeable. Move rubber attachment point one bay forward. The big improvement that needs to be made is to get rid of that damn thrust button. Even if you bush it with brass or aluminum it is still virtually impossible to shim so what's the point? I cut a big diamond hole a la resident genius Pres Bruning so you can get a pusher in there. Laminate wood on the front and back of the plastic cowl for support. On the nose block you might consider cross graining or using 1/64 ply somewhere. And here's the most useful tip I've ever received (actually I thought it up) for keeping nose blocks from wiggling: For starters, have a good fitting nose block and coat with cyano to prevent wear. Then take a little tiny dab of ultra sticky florists clay and smear it around the plug that goes into the nose. That dam stuff is so sticky it won't be moving around at all. In fact, done right you can even test different thrust settings before committing to gluing in shims. And there is virtually no weight penalty. Furthermore, you won't be getting any friction and wear on your nose block. BTW, I talked to a vice president at Guillows a couple of years ago. He was totally ignorant of the fact that it was difficult to impossible to adjust the thrust with their little black thrust buttons. In fact, I'm not sure he knew what I meant by thrust settings. He also seemed surprised to find that someone actually tried to fly their airplanes. He thought people built them for show.

Let's talk about props. It's no secret anymore that long and skinny props with a large swept area are more efficient than paddle type props. If you've been building according to my suggestions then you won't need a heavy prop up front for balance. Even if you do end up needing weight in front I believe you are better off having a light prop and adding some clay. Correct me if I'm wrong but it seems to me that you only have a certain amount of stored energy in the rubber band. You can choose to use that to create a backward flow of air or you can use it to overcome inertia and rotate a heavy chunk of plastic. I choose to create a backward flow of air. In Bill McCombs phenomenal bible "How to Make Scale Model Airplanes Fly" he has two sets of templates for suggested prop shapes. On a plane like these or Comet dime scale I'll take a 7 inch prop (I like the silver ones) and trace the shape of his recommended 8 inch prop onto it. Then I get out a tough pair scissors and cut around the outline. I scrape the blades with a knife and reduce as much mass as I can without compromising the strength. Make sure to have a sharp leading edge.

Naturally you are going to want to replace the pathetic rubber in the kit with FAI tan2. We should all be grateful that we have access to this rubber although I was somewhat of a fan of the old Sig gray stuff which seemed to last for years without deteriorating ...great for us lazy bums.

Lastly the kit tissue is your basic heavy stuff your father's day tie is wrapped in. Better shine it on in favor of some Jap tissue. Pre-shrink except on the fuselage or you'll be taking a quick trip to warp city at warp drive. I'm noted for my colorful and detailed paint jobs most of which are totally inaccurate. Ask me if I care! I would love to pass on my highly opinionated tips but I think I'm running out of space. Maybe some other time! I was never able to air brush worth a hoot until I took lessons from an expert who makes plastic models. He definitely had some great tips. It is so much easier when someone just tells you...I could have spent 30 years trying to figure that thing out. How about those \$6 air brushes at Harbor Freight? I have used one before. Thanks, I'll keep my Paasche, but you know what? They actually work OK! You can't do anything sophisticated, but for what we do they are probably adequate.

So, long story short, how much do the finished airplanes weigh? With due diligence you can hopefully reach 16 to 18 grams or so not including rubber. If you are careful airbrushing with watered down acrylic enamel you'll only add about 1.5 grams. That is certainly worth it. Forget applying any coats of clear dope. (Hey where did everybody go? Come back!)