

SHEETED WINGS

A "Sporty Scale" Special, Part II

by FRANK TIANO

A PPLYING FIBERGLASS cloth to a balsa structure is commonly called "glassing." Years ago, modelers applied many coats of model-airplane dope to balsa to create a more durable surface—one that could be readily painted and that would resist a certain degree of "hangar rash." Later, someone suggested adding a layer of tissue paper to the doped surface for an even better finish; and still later, for increased durability, we incorporated heavy silkspan on our large, heavy flying models.

The biggest breakthrough in protecting a model's very delicate balsa structure came in the mid '60s when someone suggested bonding a layer of very light fiberglass cloth to it. Because it increased a model's life, the new method provided just about everything an R/C pilot could hope for! The fiberglass-cloth-and-resin combination creates a tough "skin" that's

easy to paint and is as resistant to "dings" as possible. As a bonus, the fiberglass cloth helps to prevent the balsa from splitting along its grain in the event of a hard landing.

This glassing procedure was confined to more serious modelers; competitors, if you will. A hot Formula I pilot or an expert pattern flier wouldn't be caught dead without a glassed airplane, and many of the up-and-coming scale pilots learned the same thing: if you wanted an airplane to last, iron-on coverings just weren't the way to go!

Today, with the introduction of a new ARF every other minute, fewer and fewer people enter our sport for the enjoyment of *building* model airplanes. Many of them have an entirely different interpretation of the word "dope"; they've never heard the word "silkspan"; and they'd certainly be mortified if their new kit actually involved more than a dozen steps from

start to finish!

Every day, someone comes into my shop and asks how to do something that I find elementary. They just haven't been exposed to the art of model building. For them, model-aircraft *flying* is a hobby, but model-aircraft *building* is as far from their minds as it can be!

Because of all the wonderful ARFs available today, fewer and fewer modeling skills are being passed from one enthusiast to another. Glassing is one of these mysterious skills. Although it isn't quite as intimidating as skinning a foam wing, it probably ranks right up there with meeting your girlfriend's parents for the first time!

MATERIAL MENAGERIE

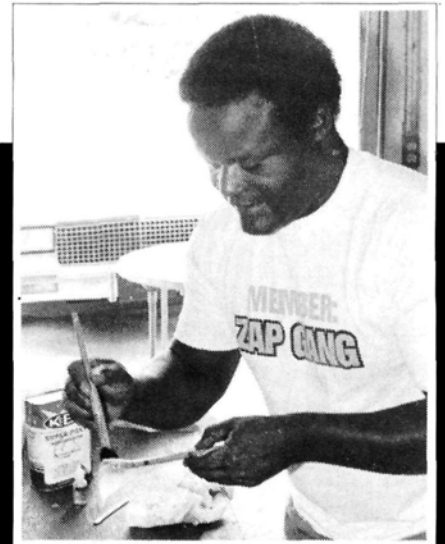
To fiberglass a fuselage, wing, or stab successfully, you must first get all your materials together. You'll need a smooth, clean work surface, a couple



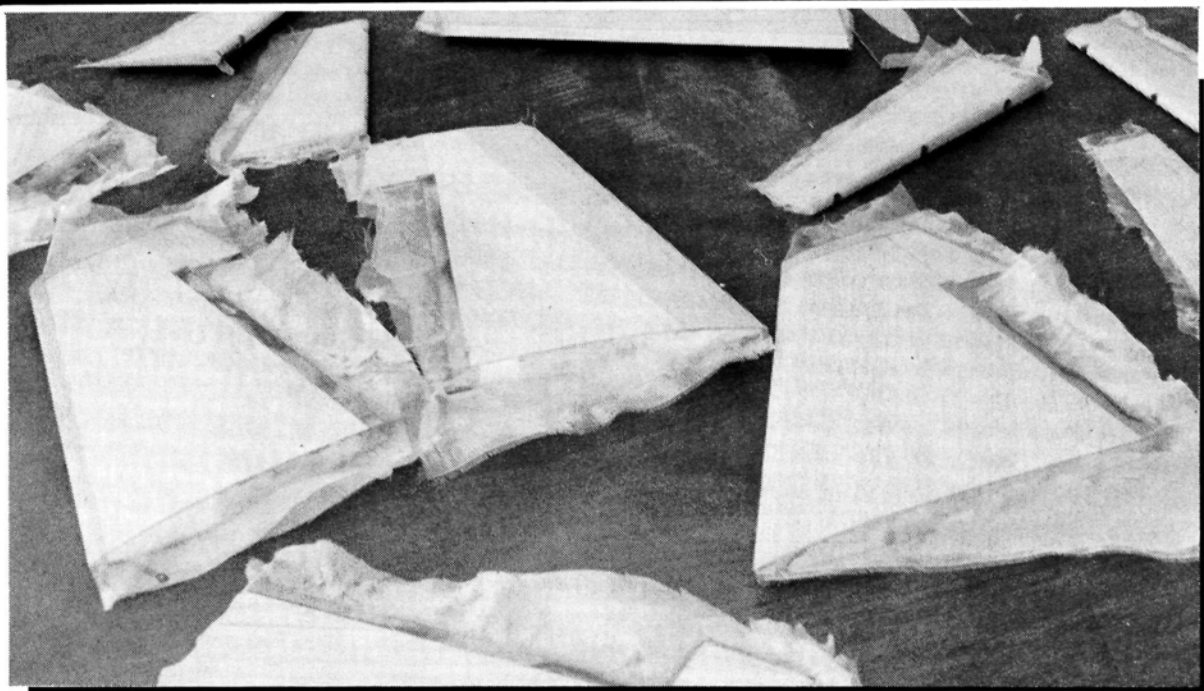
1. Sand the structure very carefully. Glass-cloth is so fine that any little protrusions will snag it and cause it to run—just like a nylon stocking.



2. The cloth is cut slightly oversize and laid over the parts that will be covered. (Sharp scissors are a must!) You can use either polyester or epoxy resins and achieve good results.



3. Using a soft brush, work the resin through the cloth's weave and onto the balsa. Brush it out toward the edges.



All these parts were glassed on both sides in one day, and this includes the time spent waiting for the first side to cure!

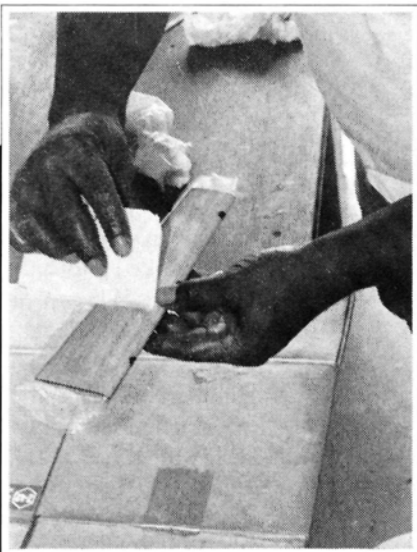
of yards of light fiberglass cloth, epoxy resin or polyester resin, some throw-away brushes, a good 1-inch brush, a squeegee (a playing card, an old credit card, or one sold by Sig*), a very sharp pair of "shop" scissors, some single-edge razor blades, a few mixing cups and an 8x3-inch sanding block.

Fiberglass cloth is classified according to how much 1 square yard of it weighs (e.g., 2-ounce cloth means that a 36x36-inch piece weighs 2 ounces). We want a high-quality,

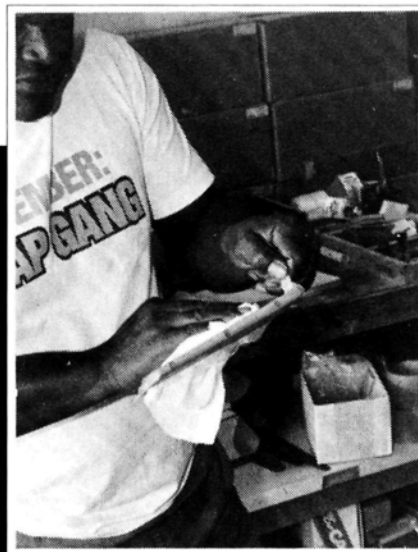
lightweight cloth with a close weave. K&B Manufacturing* offers such a product, and you can buy it in 1-yard packages at your favorite hobby store. I prefer the cloth sold by Dan "Pappy" Parsons* in Albuquerque, NM, and my reasons are simple and numerous. For one thing, most lightweight cloths claim to weigh $\frac{3}{4}$ ounce, but many actually approach $\frac{7}{8}$ ounce. (Not too bad though, unless you're building a very "weight-conscious" airplane.) For those of you who care, however,

Pappy's cloth weighs $\frac{3}{5}$ ounce per square yard, whether you buy it today or next July—whether you buy 1 yard or several! Second, I find the luxury of buying more than a single yard in a package really advantageous, especially when I'm glassing one half of a 90-inch wing that requires a piece of cloth that's at least 50 inches long if you include the overhang. Experience has played a part in my preference. I simply prefer the way Pappy's cloth

(Continued on page 63)



4. Charlie uses a squeegee to wipe away the excess resin. Don't leave any puddles.



5. Another way to remove excess resin is to use a paper towel. The surface should appear a little "wet," but it shouldn't have brush marks or streaks.



6. Here's a finished wing panel. After the resin cures for a few hours, the extra cloth is cut and sanded.

FIBERGLASSING WINGS

(Continued from page 49)

accepts both polyester and epoxy resin, and how it stays put on the surface. (The fact that I really like and admire the rebellious old son-of-a-gun has absolutely nothing to do with it!)

Gathering the rest of the necessary materials is easy. You can buy throw-away brushes (sometimes called "acid brushes") and the single-edge razor blades at your hobby store. Wax-paper cups are good for mixing resin or holding acetone for cleaning up afterwards. You should buy an inexpensive pair of scissors at an office-supply store, and only use them to cut fiberglass cloth. Cutting other materials such as carbon fiber, plywood and music wire will dull them and remove the fine edge that's necessary to make clean, snag-free cuts in the cloth.

REASONS FOR RESINS

Choose the type of resin with which you'll be most comfortable working. Polyester resin cures rapidly and has a crisp surface that's easy to sand. Its primary drawback is its very offensive, harmful vapors. On the other hand, equal-mix epoxy resins offer almost the same benefits as polyester resins, but have no harmful odor. Epoxy resins do, however, have drawbacks. They take between 4 and 8 hours to cure, and they really shouldn't be sanded until they've cured for 12 hours. Another drawback of epoxy resins is that they aren't compatible with most polyester resins i.e., they won't cure over 99 percent of them. (Yes, the reverse is possible; epoxy resins will cure over polyesters.) Why is this important?—simply because if you need to make a repair, it's faster to use a polyester resin (sometimes mixed with "microballoons" as fillers) than to wait overnight for an epoxy to cure.

For this demonstration, I let my helper, Charlie Chambers, use the product with which he was the most familiar: K&B polyester resin. I chose Z-poxy* finishing resin (my personal favorite) for three reasons: it cures quickly, its equal-mix formula is odorless, and it's the only epoxy finishing resin (that I know of) that's compatible with polyester resin. The choice is yours—both products provide a smooth, crisp finish. OK, with the educational

(Continued on page 66)



All Fox motors are test run before they are sold. This has the advantage of assuring you that the motor will run well, that the compression is good, and that the carburetor works properly. Very few manufacturers these days spend the time and money to do a test run. One disadvantage to test running a motor, however, is that the residual oil makes a motor feel stiff if it sets around very long. The stiffness will disappear once the motor has been choked and cranked a few times and gets some fresh fuel inside.

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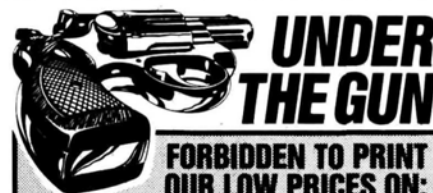
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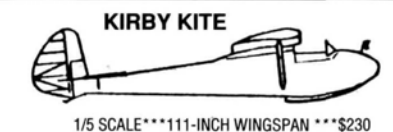


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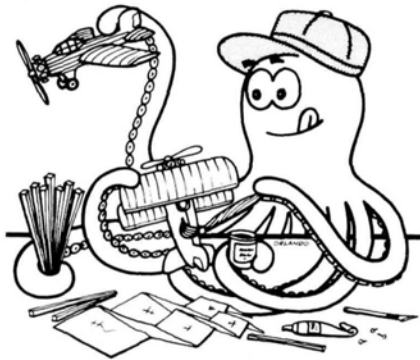
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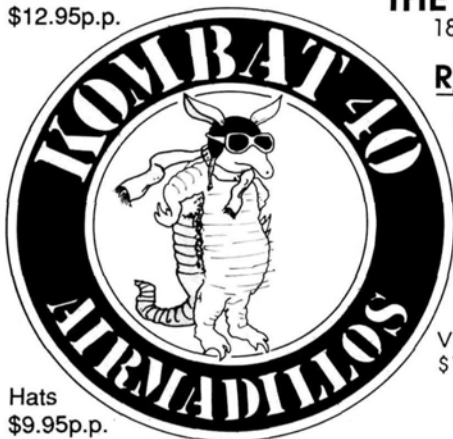
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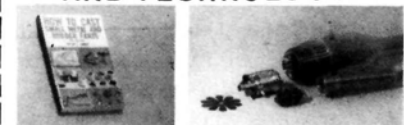
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FIBERGLASSING WINGS

(Continued from page 63)

background and preliminaries out of the way, let's get glassing!

GLASSING

These procedures outline how to glass a wing panel, but they're exactly the same for any balsa structure. First, Charlie makes sure that the sanding block's surfaces and edges are straight and free of glue globs or any other unwanted obtrusions. Remember that this surface is the foundation of an outstanding finish and, like when building a house, it must be perfect. (See Charlie working in photo 1.) When all the block's surfaces are smooth, wipe or vacuum them, and go get your glass-cloth!

Cut a piece of cloth to fit the shape of the part you'll be glassing, but cut it approximately 2 inches larger around the entire part. Now, you can use one of two methods:

- Lay the cloth on the wing panel and gently blow on it to remove any wrinkles. Using a smooth brush, literally brush out any stubborn wrinkles. Next, mix a 1-ounce batch of either the polyester or the epoxy resin and pour little puddles of it directly onto the cloth, or brush it on. Work from the part's center toward its edges. If you pour the resin, the squeegee will spread it fabulously so that the entire surface is covered with a thin film. If you brush it on, work it out to the edges so that the cloth remains wrinkle-free. To remove excess polyester resin, squeegee it off the panel and discard it, or blot the panel's surface and gently wipe it with a strong paper towel.

If you use epoxy resin, you can pick up the excess using the squeegee and return it to the mixing cup. In both cases, leave just enough resin on the panel so there's a slight sheen when the part is held up to a light. You don't want to see heavy brush marks or ripples and ridges—just a smooth, even layer of resin over a wrinkle-free piece of fiberglass cloth. (Both methods of smoothing the cloth and removing the excess resin are shown in photos 4 and 5.)

- As an alternative to pouring the resin directly onto fiberglass cloth that's draped over the wing panel, you can brush a light coat of resin directly onto the wood, and then lay the glass-cloth onto the wet surface. Then, brush or

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FIBERGLASSING WINGS

(Continued from page 75)

neat, careful and avoided making heavy brush marks earlier, your sanding chore will be much easier. If, however, you were sloppy (i.e., you didn't squeegee or blot up the excess resin) and there are ridges cured into the surface, you're probably cursing your head off and blaming me for a lousy procedure!

You'll find that both types of resin are easy to sand. The polyester type has a surface glaze that's a little tougher to break, and it occasionally develops little pinholes. A little elbow grease and some good sanding blocks make all the difference in the world!

For those who like to hand- or palm-sand (hold a folded piece of sandpaper in their hand), *forget it!* For good results, you *must* use a sanding block! This is one of the secrets of successful glassing. If you don't block-sand, you'll find many little shiny spots all over your work. These are low areas, and you'll make them if you hand-hold the sandpaper. If this happens, you'll have to put on still *another* coat of resin and start sanding all over again! So please, use the sanding block!

FILL IN THE GAPS

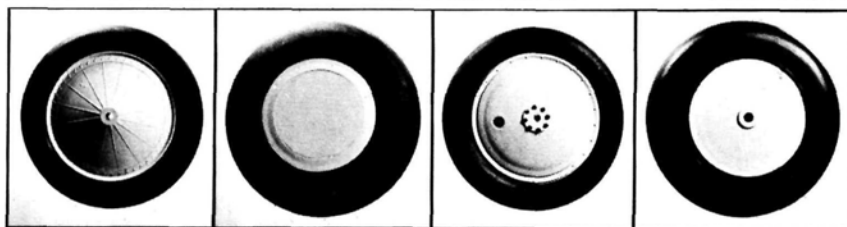
When all the parts have been sanded, wipe them down with some denatured alcohol. Check for any building imperfections, and fill the dents, gouges, or tears with a mixture of resin and microballoons made into a thick paste. Squeegee the mixture over the imperfections and allow it to cure. After this mixture has cured, block-sand it smooth until it matches and flows with the contour of the surrounding area.

That's it! You've finished! You now have perfectly glassed parts that are protected from minor hangar rash, general bashing around and more than an occasional rough landing. You now have sealed surfaces that are impervious to oil and dirt and that won't crack under slight vibrations. Best of all, you now have the best foundation for paint that anyone could ask for. If you've done the work properly, you've only added a few ounces to a normal 60- or 70-inch airplane. If you still need reassurance, try to push your fingernail gently into the new, glassed surface. You'll be happy to see that you can't. Now try it on an airframe covered with a *plastic* film!

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FIBERGLASSING WINGS

(Continued from page 78)

That alone is the greatest reason for glassing an airplane!

PICK YOUR PROCEDURE

There are many articles on how to do this and how to do that. Please remember that no method is better than another if the results are the same. Pick a method that suits your building style, and run with it—perfect it. If you like the way a product works, stay with it. Results are all we're interested in.

My next special report will offer all the skinny you could ever hope for on how and where to use Violett Supplies' extensive line of carbon-fiber materials. Talk to you then!

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Sig Manufacturing Co., 401 S. Front St., Montezuma, IA 50171.

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Bob Violett Models, 1373 Citrus Rd., Winter Springs, FL 32708. ■

SPORTY SCALE

(Continued from page 65)

everything is mass-produced, and you don't have to take a number to get a set.) If you send Impact a SASE, they'll respond with a wealth of information about their struts, wheels, brakes and tires. (Pssst! Don't forget to tell them you got the scoop here!)

PLENTY OF PLANS

The building season just wouldn't be the same without a Bob Holman Plans* catalogue. Yeah, I know; I've mentioned him many times, but I can't help talking about him again. His new issue is called *Dream Book*, and I think the title fits his catalogue perfectly. To be brief, Bob Holman has a plan for just about any R/C airplane ever designed...period!

Whether you want a plane from the dawn of flight to the 1990s...he has it. For this building season, he's introducing a new Typhoon with a 70-inch span, Brian Taylor's new P-38, a 1/4-scale Fokker D-VIII, a beautiful 1/4-scale Pfalz, a 70-inch Stuka, a 74-inch Dornier DO 17z, a

96-inch deHavilland Rapide, a 71-inch French aerobatic TR-260 and a snappy-looking, 69-inch P-51 Mustang (also designed by England's Brian Taylor). If you don't have a copy of Bob's catalogue, you're really missing something. It only costs \$5 and a large SASE. Unless you're from another solar system, I guarantee that you'll read this dream book from cover to cover—several times!

PARTING THOUGHTS

Well, that's all for this month, scale fans. Not too much to report on the Top Gun Invitational except that it's coming along well. This year, there are team entries from Europe and expert entrants from England, France and Brazil.

There are still a couple of team-scale slots open if you have the experience to compete. Just drop me a line with the name of both team members and a daytime phone number. Watch for the Top Gun advertisements for more information as we proceed. Just remember, the dates are May 2 through 5, and the city is West Palm Beach, FL.

Until next time, remember these very important things about this wonderful sport of scale modeling:

- you *won't* get more air to the blades of your autogyro by installing a pusher prop.

- "aileron flutter" is *not* cute.

- squeezing the heck out of your new engine's silencer in a vice *won't* increase your muffler pressure.

- and, *please*, when you travel to countries that rely on camels as the primary form of transportation, check your six!

*Here are the addresses of the manufacturers mentioned in this article:

Proctor Enterprises, 25450 NE Eilers Rd., Aurora, OR 97002.

Monogram Models, Inc., 8601 Waukegan Rd., Morton Grove, IL 60053.

Zenith Aviation, P.O. Box 1/RC110, Osceola, WI 54020.

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Bob Violett Models, 1373 Citrus Rd., Winter Springs, FL 32708.

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FAIRCHILD 24

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might question just how a beginner reached the intermediate level without already knowing these basics!) That fact aside, the tape does provide useful infor-

(Continued on page 108)

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ESCAPE

SPECIFICATIONS:

Wing Span	62½ inches
Wing Area	770 square inches
Engine Size	10 cc 90 or 120 four stroke

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XLT

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Wing Span	65 inches
Length	65 inches
Wing Area	845 square inches
Recommended Engine Size	10 cc 90, or 120 four stroke

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SPECIFICATIONS:

Wing Span	63¾ inches
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