



Ragwing repaint

The Timeless Tri-Pacer emerges with old colors on a new skin



IT is written right into the microcode of human nature to want to do better. We see a tree and want it to be taller and stronger for our assistance; we recall opportunities lost and vow to not make the same mistake twice; we start with a perfectly serviceable 40-year-old airplane and want to remake it in the image of perfection. What

By Marc E. Cook

this desire to improve fails to encompass is that production-line realities preclude serial perfection. ● Piper's brass knew this. The Tri-Pacer as originally built was done with care where necessary, but with expediency elsewhere. When the company ran out of steel tubing for the fuselage cage, for example, the workers simply spliced in a new chunk; no need to waste or scrap tubing just because it's not long enough for the run. Similarly, items like the fabricated wing ribs—with

dozens of small U-section braces and tiny rivets—show that in 1950s America, labor costs were, for Piper at least, less onerous than buying tooling that could stamp out a single rib. (Univair, today's supplier of just about every airframe part for the PA-22, has in fact created a new stamped rib.) That Piper was able to crank out so many Tri-Pacers a year is astonishing when you have had the chance to examine the airplane closely. It's that complex. ● All this is prologue to the explanation of why, in early May, our Tri-Pacer was just on the verge of taking flight once again. A frenzied push by the Clarksburg Air Repair crew to finish the work in time for the AOPA Fly-In the first weekend in June had had all hands on deck—it just goes to show you that no restoration is quick, even one starting with a sound airframe. Individuals working in their spare time can expect a year or two of work for a project like ours. ● After the basic

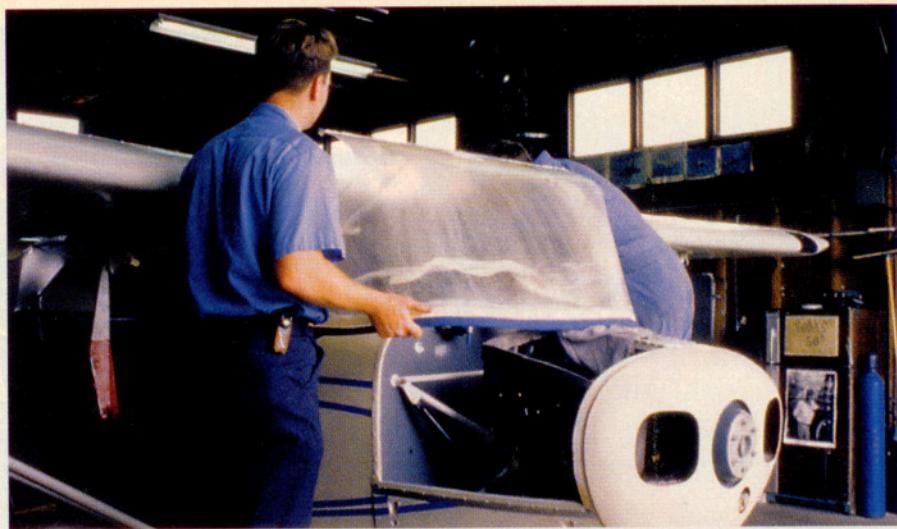
PHOTOGRAPHY BY THE AUTHOR

airframe restoration took place—including replacement of just about every moving part, powder-coating of the fuselage and many smaller components, and complete two-part epoxy priming of the interior wing surfaces—it was time to begin the re-covering process. We were aided several ways here, both in labor and materials. Poly-Fiber donated the re-covering supplies, including paint, and Aircraft Spruce and Specialty gave us a fuselage envelope. The envelope is simply pre-sewn fabric in the approximate shape of the fuselage; it saves considerable time in cutting, draping, and shaping the fabric. For the wings, controls, and tail surfaces, simple flat skeins of Poly-Fiber fabric were used, glued into place and reinforced with strips of fabric called tapes. (For a more in-depth discussion of the covering process, see “Timeless Tri-Pacer: Airframe Arrangements,” April *Pilot*.)

Applying fabric is, for the most part, easy, but it requires care and forethought. The Clarksburg boys took about a month to get the airframe from bare parts to being ready to paint. Each control surface must be fitted with fabric, shrunk with the heat from an iron, reinforced with tapes, and then filled out with the Poly-Brush and Poly-Spray products. There’s a lot of hand work here, including placing items like drain grommets at the low points of the wing and control surfaces.

“It’s easy for a project like this to grow without knowing it,” says Mike Pavao, owner of Clarksburg Air Repair. “You get in there and say, ‘Let’s do new fuel lines.’ Boom, you’ve just spent 10 hours and almost \$500 on just that one thing.” Human nature steps in and says, basically, if you’re going to the trouble to take the airplane completely apart, does it make sense to leave behind 40-year-old tubing or wiring?

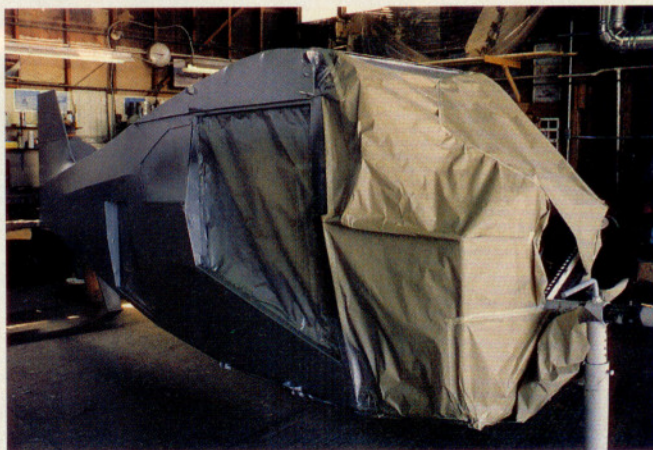
Once the airframe items have been tended to and the fabric installed, the time comes to begin the painting process. Our Web site asked for votes on three possible schemes for our Tri-Pacer penned by AOPA *Pilot* Art Director Mike Kline. Two were derivatives of schemes used by



The Tri-Pacer gets a new LP Aero Plastics windshield (above). The paint scheme was selected through voting on AOPA Online (below).

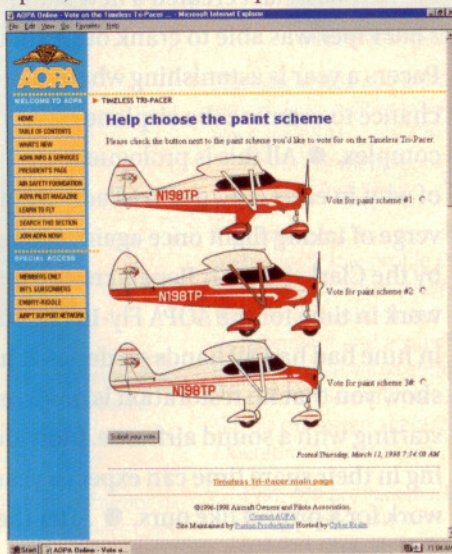
Piper on various vintage Tri-Pacers, while the third was remarkably close to the correct 1958 presentation that was on N8134D to begin with. Voting was extremely close, with just a few nods putting the original scheme over the top. We made a few small adjustments, including the deletion of the tail swoosh to make room for the Timeless Tri-Pacer logo. The colors, Santa Fe Red and Daytona White, are also correct for this model year of Tri-Pacer.

Painting a fabric airplane calls for a number of steps not strictly necessary on the metal model. For example, the first “primer” coats in the Poly-Fiber system are called Poly-Spray. This is a vinyl-based paint filled with aluminum powder often referred to as *silver*. Its main job is to prevent ultraviolet light from reaching the fabric, but the fillers in the product also help to fill minor imperfections and provide a base for light sanding of the surface to achieve a desired smoothness.



Poly-Spray is dispensed in double-pass *cross-coats*. After the first layer, minor imperfections are sanded out with 320- to 400-grit wet/dry sandpaper, and the edges of the tapes are sanded to make sure they lie flat. It’s common for the tapes to lift slightly as you work the fabric, in part because the Poly-Fiber system cross-links the chemicals between the substrate and the finish coat, so some loosening is normal. Next is another set of cross-coats followed by a second round of inspections for blemishes. Finally, a third layer of silver cross-coats is applied; there should be no further sanding required.

Next come the color coats. First, though, a word about the Poly-Fiber system. It is the company’s firm belief that the only way to paint fabric is with a non-hardening, vinyl-based paint. Poly-Fiber believes strongly that urethanes and other epoxy-based paints cannot, even with flexative agents, become flexible enough for use on fabric. That’s fine, but it’s just the makeup of epoxy-based paints (and other automotive paints as well) that makes for a shiny surface. Poly-Fiber’s Poly-Tone, like finishes of old, tends toward the





matte. It can be "brightened" some by adding a retarding agent to the paint; this slows the cure time and increases the shine. Even so, the finish coat will not be as glossy as you'd find on a metal airplane painted conventionally.

The payback is greater flexibility of the paint, which should translate into better long-term wear, as well as simple reparability.

Sounds like the ideal system, right? There are a couple of shortcomings. Poly-Tone does not work well on metal; for these surfaces, Poly-Fiber recommends

its product called Aero-Thane. But this two-part paint is, by its very nature, much shinier than Poly-Tone. So the company recommends *flattening* the paint to help match the fabric's gloss level.

We did all that, but we discovered a quirk of Poly-Tone and Aero-Thane that the Clarksburg shooters say they've seen before: The paint shades did not match. Unfortunately, the Tri-Pacer's fabric fuselage sides are abutted by metal doors and cowling; at those intersections, the differences in color are fairly dramatic. Because of the last-minute



Steve Wilke sprays the final red on the boot cowl.

Everything underneath is Daytona White. The finished paint job (left) is remarkably close to the spec-1958 version. The stabilizer wires and various cuffs have not yet been installed.

nature of the painting, we were forced to obtain custom-matched automotive paint for the metal surfaces to be colored in the Daytona White and Santa Fe Red. Had we been able to wait for replacement paints—better matched to the Poly-Tone—to arrive from Poly-Fiber, there's no reason we could not have continued with Aero-Thane.

Sure, we spent some extra time and had to repaint some of the metal items, but the results are worth it. Our Tri-Pacer's finish is far smoother and more consistent than Piper ever managed; no

surprise, given that the materials are light-years better than in the 1950s and that we had a lot of hand labor invested in the PA-22's preparation.

As the airplane came together after painting, we had the opportunity to install some of the improvements that we had planned for the airplane. These include Cleveland wheels and brakes. We kept the controversial hand brake but used these new disk brakes in place of the less-effective stock drums.

We also installed a Whelen three-light strobe system in place of the standard rotating beacon. Clarksburg's Scott Monroe modified the standard Grimes nav-light mounts to take the combination nav/strobe units.

Finally, a new lower instrument panel was installed prior to a ferry flight from Sacramento to Avionics West in Santa Maria, California, where the avionics stack will be installed. This Z-shaped rail replaces the lower part of the stock instrument panel, mounting to the standard tabs descending from the main instrument cross-tube. We consolidated all of the airframe electrical switches—now

switch/breakers—over on the left side, while slightly rearranging the remainder of the panel. The main benefit is to allow the top part of the panel to come out of the airplane without disturbing the engine controls, which bolt through the lower panel and securing tabs. (We'll discuss the new panel in-depth in upcoming Timeless Tri-Pacer installations.)

In all, this PA-22 has received few airframe alterations, in part because there aren't very many available. Perhaps the

lack of so-called speed mods reflects the futility of trying to make the Tri-Pacer a Bonanza-eater. In any event, our Tri-Pacer has become essentially a new airplane, albeit one that has all of its yesteryear charm and systems simplicity. That the re-cover and paint jobs appear right out of a 1958 Piper catalog only confirms our belief that the Tri-Pacer is an affordable classic worth keeping. □

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Help with the process

Covering system, paint
Poly-Fiber Aircraft Coatings
Box 3129
Riverside, California 92519
800/362-3490
www.polyfiber.com

Fuselage envelope
Aircraft Spruce and Specialty
225 Airport Circle
Corona, California 91720
800/861-3192
www.aircraft-spruce.com

Airframe components, cowling,
instruments
Univair Aircraft Corporation
2500 Himalaya Road
Aurora, Colorado 80011
303/375-8882
www.univair.com

Windshield
LP Aero Plastics
RD #1, Box 201B
Jeanette, Pennsylvania 15644
412/744-4448

Lighting (position and strobe
lights)
Whelen Engineering Company, Inc.
Route 145, Winthrop Road
Chester, Connecticut 06412
860/526-9504

Wheels and brakes
Cleveland Aircraft Wheel & Brake
1160 Center Road
Avon, Ohio 44011
216/937-6211
www.parker.com