

Airframe arrangements

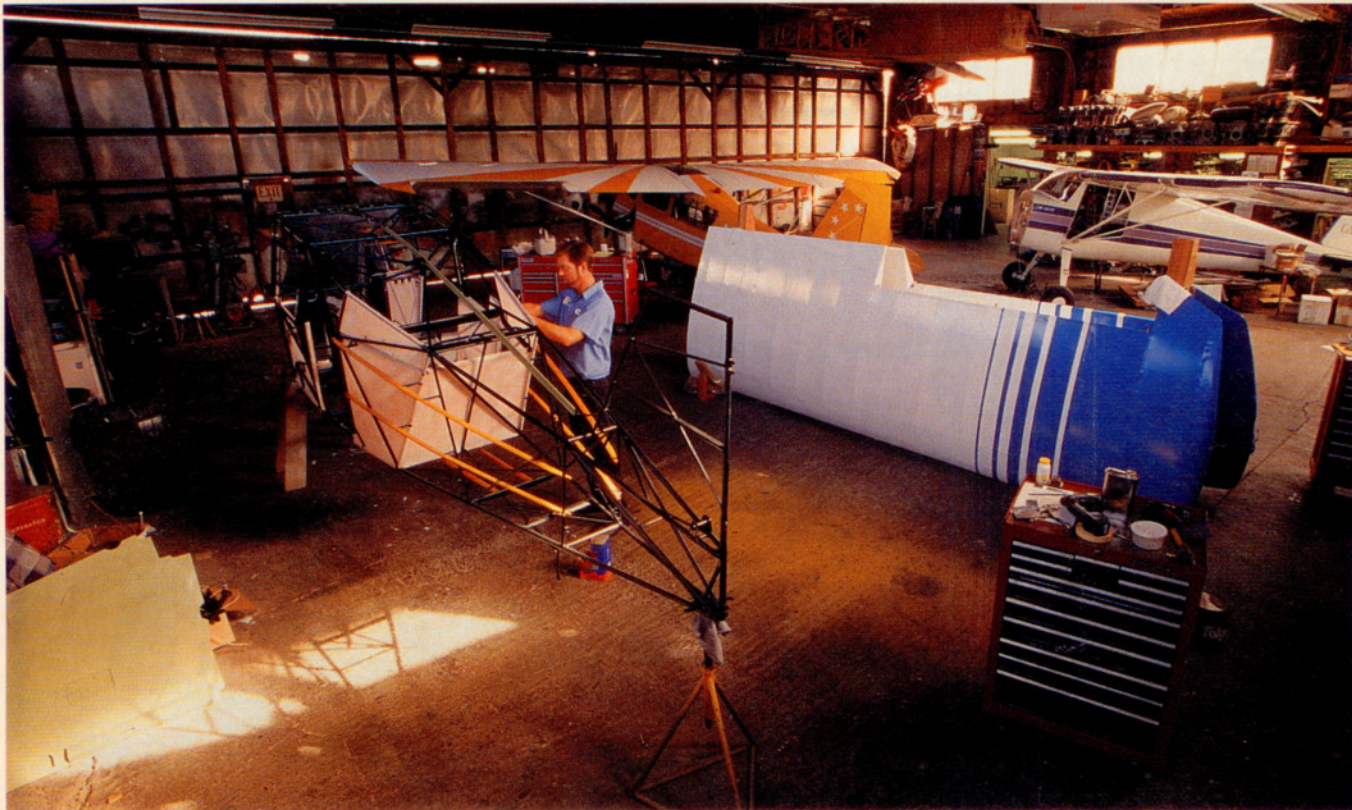
Undertaking restoration of the Timeless Tri-Pacer's airframe



You never know what you'll find when you open up a 40-year-old airplane, particularly one swathed in fabric. Will the stories told by the airframe be of hardship and neglect or of easy living and fanatical upkeep? A lot depends on continuing maintenance, use of the airplane, and, quite honestly, luck. Save for a notable incident in the mid-1960s, N8134D, our 1998 AOPA sweepstakes project, has lived a charmed life. So when the crew at

By Marc E. Cook

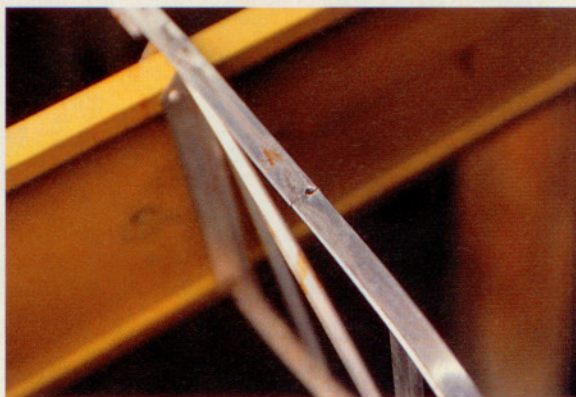
Clarksburg Air Repair near Sacramento, California, removed the covering from our Piper Tri-Pacer and there was little underneath that raised an eyebrow among Mike Pavao's staff or called out for heroic restoration measures, we all breathed a sigh of relief. After all, you can tell only so much in a conventional inspection of a fabric airplane; the accessible spaces tell you just part of the story. Besides, our prepurchase inspection was necessarily cursory because we intended to open up the airplane as part of the project. ● Progress in a comprehensive restoration is necessarily deliberate. We had intended to talk about the magic of re-covering and painting a rag-wing airplane in this installment, but, as we go to press in early March, the Timeless Tri-Pacer has just begun the re-covering process. We'll get you caught up in the next chapter, slated for the June issue. ● Before you can replace the covering, you first must remove the old. It's important to do this step carefully, because cutting the old skin from the steel-tube bones incautiously can create a larger restoration project



Clarksburg Air Repair's shop is both homey and busy, with our Tri-Pacer (foreground) as well as a Citabria in for gear work and a Cessna 120 awaiting its engine. A cracked nose rib (below) will be repaired.

than you started with. Moreover, removing the old fabric mindfully gives you the chance to see what's underneath every section and to photograph or otherwise record the locations of important systems and fasteners. Clarksburg Air Repair took about a week to get the wings and fuselage stripped of fabric, which coincided with removing the engine, wings, tail surfaces, landing gear, cowling, and seats. (AOPA's Aviation Services department has a list of maintenance facilities that perform fabric repair and replacement. In addition, this list will be available on the AOPA Web site.)

Once apart, our Tri-Pacer's fuselage tubing was carefully inspected. It exhib-



have to marvel at how Piper managed to crank out these airplanes by the dozen. We also got a look at the repairs made after a mid-1960s off-runway incident, which were well done, and to notice that Piper apparently ran out of tubing

cables were removed along with their pulleys and moveable bracketry. In short order, Monroe had the PA-22's fuselage down to the bare tubing, ready to be inspected for cracks and tired welds. All told, our Tri-Pacer was in great shape—the interior fabric was the original to the airplane's manufacture in 1957—but rather than experience the tedious hand preparation of the tubes, we sent the whole cage out to be powder coated. This electrostatically discharged paint is durable and handsome, and, best of all, compatible with the covering system Pavao had in mind. Because he and his staff were most familiar and comfortable with the Poly-Fiber

Progress in a comprehensive restoration is necessarily deliberative.

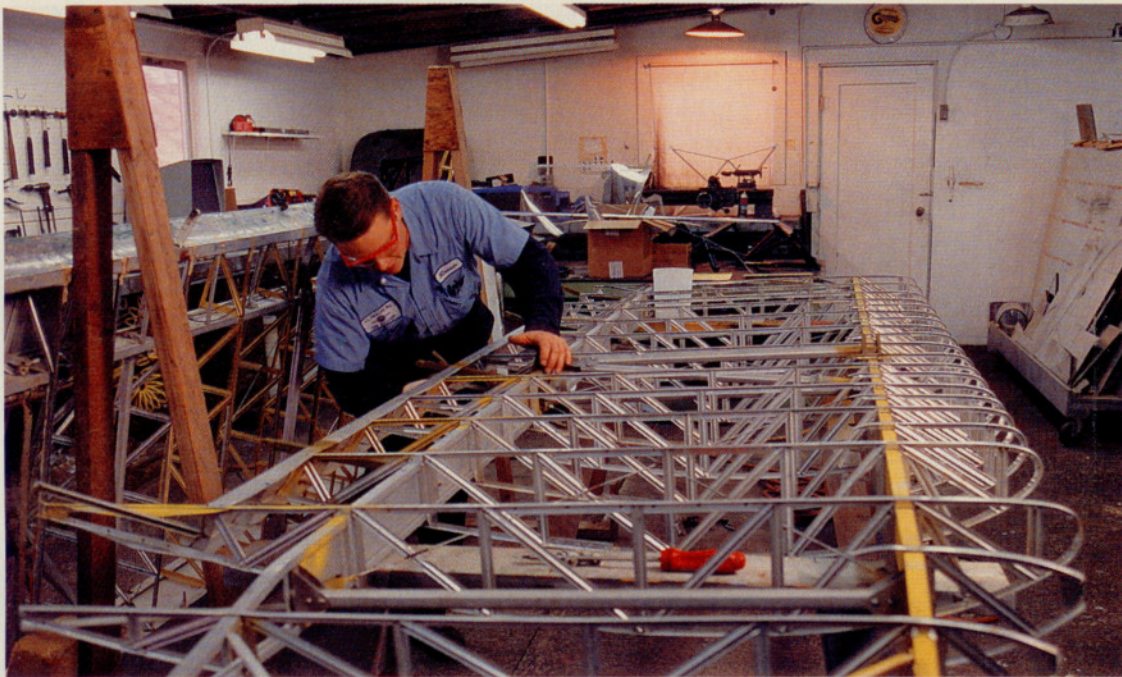
ited an expected amount of surface rust, given that the last re-covering took place in 1970 and that the airplane had been kept in a hangar for most of the time since. One of the shortcomings of the steel-tube fuselage frame is that it's a complex creature, with myriad tubes and welds, countless brackets and supporting structure. Looking at our nearly complete cage being reworked, you

while building up one of the aft longeron tubes. There's a factory splice a couple of feet from the tail.

After the fabric had been removed, Scott Monroe, the point man on the Timeless Tri-Pacer project, began to remove everything from the fuselage cage. Interior pieces, including the entire instrument panel, headliner, and subflooring, came out and the control

covering system, that's what Pavao recommended.

Meanwhile, in another part of the Air Repair shop, the Tri-Pacer's wings were undergoing their own teardown. Good news came in the form of aluminum leading-edge skins in excellent condition and a general lack of corrosion. Several ribs had minor cracks beginning to form—I'm told this is a common



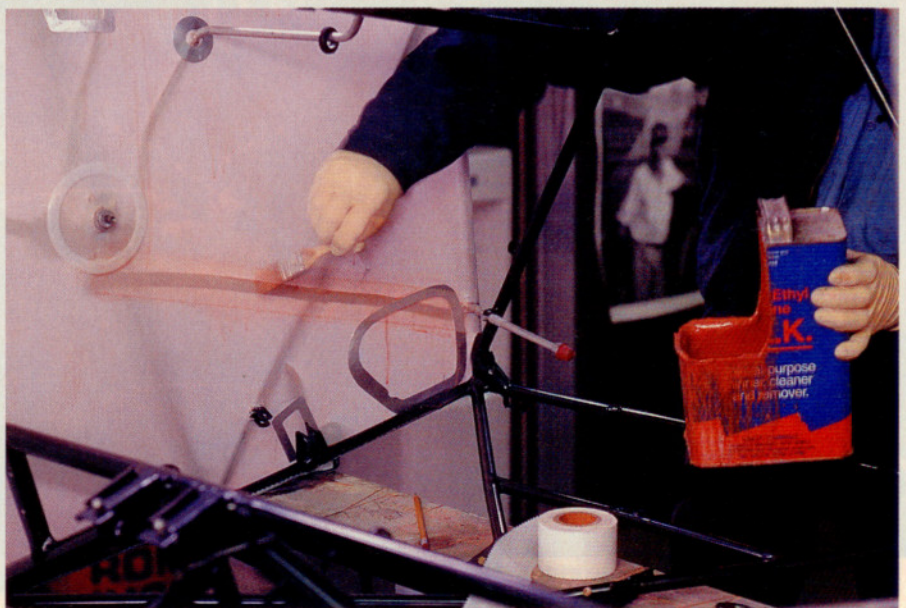
One of our Tri-Pacer's wings is stripped to the essentials (left). A fair amount of tedious hand labor is required to patch rib cracks and prepare the various fasteners and assemblies for a complete covering of epoxy primer. The Tri-Pacer's interior fabric (below) is installed by Scott Monroe, who is heading up our restoration project.

occurrence in 40-year-old airplanes—that would require approved hat-section patches. Both main spars were in good shape, although, curiously, the left wing's was fully zinc-chromated, while the spar in the right wing was in bare alloy, as Piper made it. (An explanation follows shortly.) The top surface of one fuel tank had a nasty crater that the Air Repair crew ultimately decided was not repairable. A call to Univair Aircraft Corporation got us a refurbished tank that looks for all the world like a new-production part. The other tank was fine, although it had suffered a number of small leaks at the outlet hoses and would need some cleaning up.

Ultimately, the wings were generally cleaned up and treated to localized prep work where the steel wing-strut fittings meet the aluminum. Small internal X-braces help to keep the wing square and true, and Monroe spent several hours with a trammeling board and a set of wrenches ensuring that our wings would be exactly as Piper intended them.

The Piper's tail group was removed and disassembled as well. Both elevators were fine, but there was substantial rust at the lower rudder post, a location known for trapping water. One of the benefits of working with a steel-tube skeleton is that repairs are straightforward. Air Repair's Mark Keema cut out the bad tubing and spliced in new sections; an all-aluminum airplane might well have needed a new rudder or a costly reworking of the original part.

Up front, further inspection disclosed a bent member in the nose-gear



truss, which makes up part of the engine mount in the Tri-Pacer. Another piece of the damage-history puzzle fell into place, as did an explanation for one of 34D's curious handling quirks. I'd noticed that to track the runway centerline on takeoff required relatively little rudder deflection, but as soon as the nosewheel came off the ground, the nose would whip around to the left. A quick poke of the rudder would get the nose back on track. I originally thought this quirk came from faulty rigging between the nosewheel and rudder cables, but a bent nose-gear member would also explain it. What's more, the Tri-Pacer's cowling, which had several cracks patched—again a common PA-22 malady—came off and went into a corner. We ordered and

received a replacement from Univair that is, as you'd expect from a new part, a lovely piece of work. At about \$900, this lower cowling is quite reasonably priced.

Those of you spitting up coffee thinking about spending nearly a thousand dollars to rid the lower cowl of a few patches, consider this side note about the complexity of our restoration. It won't be hard to invest as much as the purchase price of this airplane into just the airframe restoration. Complicated machines are time-consuming to take apart, inspect, repair, and reassemble. Compared to a Cherokee, the Tri-Pacer is a Boeing 747 kind of complex, and it's no wonder that the production efficiencies of monocoque aluminum airplanes rendered the rag-wings obsolete. What

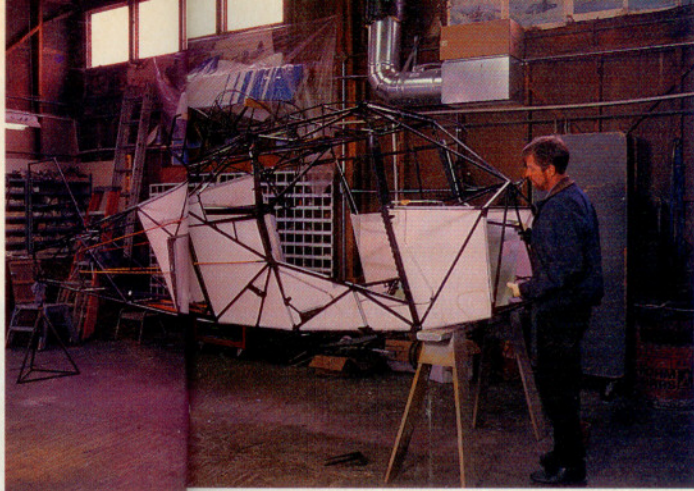
any sane owner of this airplane would have done is to remove the old fabric, inspect and clean the fuselage tubes as necessary, replace the control cables in need of attention (as well as tend to their associated pulleys), and re-cover the whole thing. Re-covering could be done in a month for about the cost of a major engine overhaul.

Instead, we have chosen a different route. Almost everything that moves in this airplane has been replaced with new or refurbished parts, or, if appropriate, cleaned up and repainted. You won't see many old parts on this Tri-Pacer and, without trying to offend the short-wing Piper contingent, it's likely to be one of the cleanest, most thor-

oughly refurbished examples you'll find. (One other guiding principle we've been trying to follow, to the grinding of the accountant's teeth, is this: Make repairs as though the most discriminating, nitpicky pilot would be the next owner.)

The Timeless Tri-Pacer will also be more aligned with the standard airplane than have our other modified sweepstakes prizes. Instead, we're taking the not-broken, don't-fix attitude

about many aspects of the Tri-Pacer. One thing we're loathe to change is the airplane's systems simplicity, which makes for a durable, easy-to-fly family



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Arrow hits home

Massachusetts CFI wins airplane

Paul Perrone stood on the ramp at Norwood (Massachusetts) Memorial Airport, answering questions about his ultimate goal of working as an airline captain. Little did he know that the videotaped "interview" was sim-

airplane."

Perrone, of nearby Medfield, shook his head in disbelief. "No way—this is incredible. I'm speechless...this is unbelievable."

A crowd of pilots, FBO employees,



MICHAEL P. COLLINS

and other well-wishers who had noticed the Ultimate Arrow's arrival—accompanied by a sedan emblazoned "AOPA Prize Patrol"—broke into applause.

"I don't know what to say," Perrone said. "Thank you" isn't enough."

After the excitement abated, the 30-year-old CFI tied down his airplane for the first time. "I've been doing this for six years for somebody else," he remarked. "I never thought I'd be doing it for myself."

ply a ruse to get him to the airport. He intently shared his career plans, oblivious to AOPA's Ultimate Arrow as it taxied up behind him.

AOPA President Phil Boyer shut down the airplane, climbed out, introduced himself to Perrone, and broke the news: "Guess what? This is your

ULTIMATE ARROW

Perrone first flew the airplane four days after its February 7 delivery, as soon as he obtained insurance on the refurbished 1978 Piper Arrow. "I was really excited to just get in it and fly it," he said. "It was really cool." He put about 12 hours on the airplane in his first two weeks of ownership.

The Ultimate Arrow has been turning heads at every airport Perrone has visited. He said that he has been enjoying the task of learning the airplane's complement of avionics.

"I'm having a ball with it, I really am," Perrone said. "It's amazing how many people come down and look at the airplane. The best thing about it is being able to share it."

Perrone's first passenger in the Arrow was his girlfriend; on the day after Valentine's Day they flew to Nantucket, where he proposed marriage. "She was caught totally off guard—just like I was on the day [that AOPA] gave me that plane." Perrone had planned the trip before he won the Arrow, thinking that he'd take the Piper Seminole in which he recently earned his multiengine and commercial privileges. "Little did I know that I'd be doing it in my own airplane."

Sun 'n Fun or Oshkosh could be destinations for later this year, Perrone said.

—Michael P. Collins

flyer. The just-awarded Ultimate Arrow is, while certainly a forward-looking traveler, notably more complex than the bone-stock PA-28R; many of you have asked for an airplane as easy to work as a doorbell. We are, however, making every attempt to replace production-expedient parts and processes with analogs that will render this airplane as inexpensive to own and fly as possible.

Back to the restoration: By early February, the fuselage structure and tail group had come back from the powder-coater's and was ready for the many

components to be refitted. Air Repair had a used nose-gear truss on hand that was inspected and powder-coated as well.

Monroe began to assemble the control system with new stainless-steel cables and a combination of new and refurbished pulleys. (Some pulleys in the PA-22 are under more stress than others and tend to wear out more quickly.) Piper used only control cables in the Tri-Pacer, with the exception of pushrods in the rudder system between the pedals and the nosewheel. The stat-

ic system was reinstalled, using some of the old piping but all-new rubber components. Monroe fabricated new hard fuel lines with far more precision than the factory ever did; you could see that the soft aluminum tubes had been hand-bent to go into the fuselage with as little fuss as possible, with little regard to how they looked.

The Tri-Pacer's original wiring was, as you'd imagine in a four-decade-old airplane, a mishmash of original pieces and cobbled-on patches, extensions, and replacements. (The airplane, according to the logs, had housed at least four different sets of radios.) It came out entirely and was supplanted by all-new wiring, including cables for the modern avionics stack we're planning. At the same time, the original panel flew down the state to Avionics West in Santa Maria, California, to act as a template for an all-new flat metal replacement.

Now, about that damage history. The logbooks on 34D show that it was annualized in March 1964. The next entry is a long, detailed description of a comprehensive rebuild job, including a list of what had been replaced—items including some tubing in the upper right door post—in 1970. That was, apparently, the last time the airplane was covered. Three years later, a factory-remanufactured Lycoming O-320 was installed. Nearly three decades following extensive repairs after what appears to be a landing accident in which the airplane completed the ballet on its back, the workmanship remains impressive. And for those of you with a phobia about damaged airplanes, think about this: There are precious few 40-year-old airplanes that haven't had some kind of run-in with gravity.

In any event, our finished Timeless Tri-Pacer will be very far removed from the PA-22 that had an off-course excursion sometime in the mid-1960s and, in fact, a much more methodically built airplane than Piper could ever have managed, given the necessary constraints of "get 'em out" production policies. For those of you who believe that they don't build airplanes like they used to, get ready to envy the one of you who will win an affordable classic that's far better built than it ever was. □

Members may vote on a paint scheme for the Timeless Tri-Pacer on the Internet (www.aopa.org/pilot/tripacer). E-mail the author at marc.cook@aopa.org

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