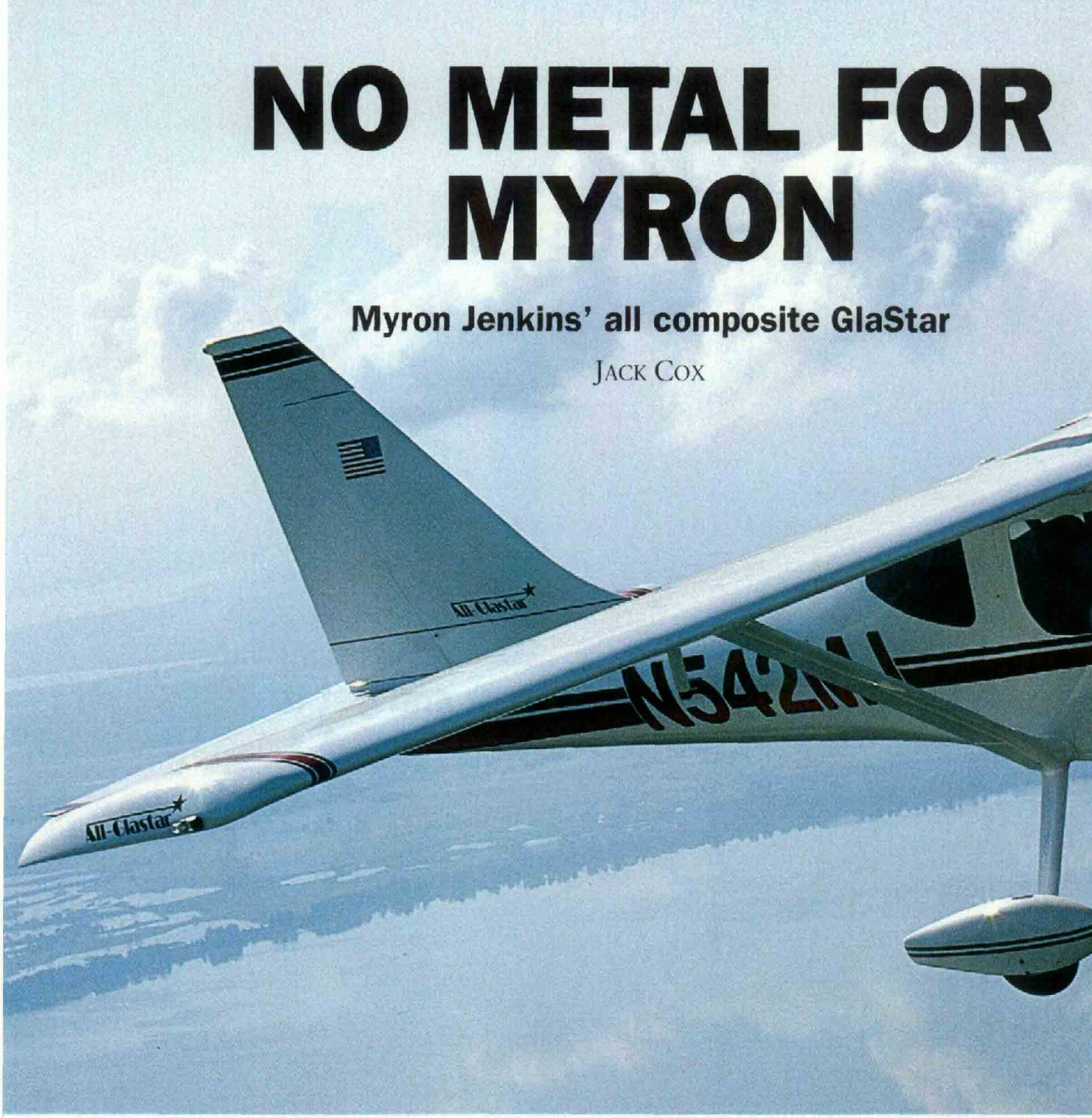
NO METAL FOR MYRON

Myron Jenkins' all composite GlaStar

JACK COX



Myron Jenkins of Parker, Arizona, is a world-class builder of composite homebuilts. In 1985 he completed a 160-hp Glasair RG that won awards everywhere he displayed it, but he really hit the jackpot with his second project, a Glasair III he completed in 1991. That fall, in its first outing, the airplane was the all-category Grand Champion at the Copperstate EAA Fly-In at Prescott, Arizona, and the Grand Champion Homebuilt at the Southwest EAA Fly-In at Kerrville, Texas, a couple of weeks later.

In March 1992 the Glasair III was the Best Homebuilt at the AAA Cactus Fly-In at Casa Grande, Arizona, and the Grand Champion Homebuilt and Great Grand Champion at Sun 'n Fun '92 (which earned Myron the cover and a feature article in the June 1992 *Sport Aviation*). Completing the grand slam, the airplane was the Grand Champion Homebuilt at the 1992 Northwest EAA Fly-In at Arlington, Washington, and Grand Champion Custom Built—Kit at EAA AirVenture Oshkosh.

Obviously, Myron is a big fan of the various Stoddard-Hamilton homebuilt designs. Even though it was virtually a 180-degree departure from the company's previous low-wing models, when the August 1994 *Sport Aviation* in-

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troduced the GlaStar, Myron was immediately attracted to the high-wing, strut-braced Stoddard-Hamilton design.

He did have one big hang-up, however.

The Glasairs were the pioneers in molded composite construction, but the GlaStar was something quite different. It had a molded fuselage shell typical of many composite designs, but it incorporated a welded steel-tube cage inside the front half that served as the load-bearing structure for the engine, landing gear, and wings. That Myron could live with, but he drew the line when it came to the GlaStar's riveted aluminum wings, rudder, and horizontal tail.

"I just don't like pounding rivets," he says. "I don't think I could meet my own standards working on a metal airplane. I like composites. I like to work with fiberglass, and I'm used to having an aerodynamically clean, Glasair-type airplane. I liked everything about the GlaStar except the metal wings and tail, so I figured that if I wanted one I would have to build it entirely out of composites."

Rather than trying to reengineer new wings, Myron decided to simply duplicate the aluminum parts using carbon fiber and fiberglass. The project began when he had the opportunity to examine a GlaStar wing and measure the various parts and components. The next step was to make molds, then lay up parts in them. He used the same Hercules carbon fiber cloth that went into the primary structure of the globe-girdling *Voyager* to build his spars and skins. He made his ribs out of fiberglass and used Stoddard-Hamilton's low toxicity vinylester resin throughout.

Early on, Myron made the Stoddard-Hamilton management team aware of his intentions, but he never felt they were taking him seriously, until he showed up at Oshkosh one year with his construction photo album and some sample parts he'd made. They were suitably impressed with his excellent workmanship—certainly no surprise considering all the Grand Champion trophies he had won with his Glasairs. But they were still amazed that anyone would go to all the trouble of making molds for essentially every part in the GlaStar's wings, ailerons, flaps, the horizontal stabilizer, the elevator, and the rudder—not to mention making the parts himself!

Myron says fellow Glasair builder, Roger Heisdorffer, of Taylor, Arizona, was a valuable mentor to him as he broke new ground in substituting composites for aluminum. At the time, Roger was also building a GlaStar with the standard metal wings and tail, and he provided a lot of technical insight and encouragement.

After making the wing and tail spars and ribs, all identical to their metal counterparts except for

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Modeled after his award-winning Glasair III, Myron again installed an all-leather interior including a leather-covered instrument panel.

wider flanges for bonding, Myron began laying out his exterior skins on a 15-foot-by-30-inch glass-topped work table he'd built years ago for building his Glasairs. Each GlaStar skin consisted of two layers of carbon fiber, with the weaves oriented 45 degrees to the other. To attain the correct shape and to avoid excessive bending of the flat skins, he made molds to form the leading edge skins.

Myron used the space between his main and rear spars to create fuel tanks, sealing the voids in much the same manner as in his earlier Glasair wings. Ultimately, he would find he had room for a total of 65 gallons, all very near the airplane's center of gravity.

The standard GlaStar has Frise ailerons, but choosing to avoid the wide gaps common to that type, Myron employed the same piano hinge attachment used in the Glasairs. This change presented the problem of how much differential (up/down) action to use to reduce adverse yaw. After consulting with Roger Heisdorffer, Myron built up his own bell crank actuator mounting plate with a series of holes that allowed him to change the aileron differential. Roger's advice was to start with a 2-to-1 ratio and then make changes as needed.

Closing the wings was a "ticklish" process, Myron recalls. It involved applying seemingly endless smears of resin on the rib flanges and then wrestling the large, floppy skins in place. He clamped the trailing edges between long bars of aluminum to keep them straight and used weights to keep the skins tightly pressed against the ribs and spar caps until the resin cured.

After completing the wings, Myron built a mounting fixture and, using data from Stoddard-Hamilton, proceeded to load test them. Both easily withstood the load, but with the same load Myron's composite wings deflected 8 inches while the factory prototype's metal wing deflected 6 inches. To Myron's great satisfaction, his wing panels came out weighing about 18 pounds less than the standard aluminum wings, even with the super smooth, ripple-free finish he can't stand to be without on his airplanes. He built the GlaStar's horizontal tail and rudder in essentially the same manner as the wings, with piano hinges to attach the elevators.

With his wings and tail surfaces well under way, Myron ordered a tri-gear GlaStar fuselage from Stoddard-Hamilton. Built in standard form, it readily accepted his composite wings and tail because all the attach points were identical to those in the metal versions.

Myron ventured out on his own again when he selected an engine. A 125-hp Continental IO-240 powered the prototype GlaStar, which later received a 160-hp Lycoming. Myron moved even farther up the power scale, installing a 200-hp Lycoming IO-360 in his airplane. An experienced engine builder long before getting into homebuilts, he'd rebuilt the engines in both his Glasairs—and did so again for his GlaStar. He bought a 160-hour engine from a wrecked airplane, tore it completely down, and rebuilt it using higher compression pistons and "chroming everything I could."

The engine had a front-mounted fuel injector unit, and Myron made his own intake for it in an effort to get some additional ram air boost. To better cope with Arizona's sum-

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Myron duplicated the aluminum parts of the GlaStar using carbon fiber and fiberglass. Each wing skin was built up from two layers of carbon fiber with the weaves oriented 45 degrees to the other.

mer temperatures, he installed an oversize oil cooler and ran two duct hoses to it. Toward the end of the project, he had Margie Warnke build a wood prop for the airplane, similar to the Almost Constant Speed prop her late father built for Myron's Glasair RG in the 1980s.

With the major airframe and engine work behind him, Myron was able to begin what is for him the fun part of a homebuilt project—turning his creative side loose on all the fancy stuff. Stuff like a full-leather interior, underseat tool boxes, a custom, leather-covered instrument panel modeled after the one in his award-winning Glasair III, and an engine cowl with no visible screws, hinges, or fasteners. He also installed his own spring-loaded rudder and aileron trim systems, as well as an electrical flap actuator.

Myron has always had a self-confessed need for speed, and his goal from the start of his GlaStar project was to end up with the fastest example of the type in existence. That was one of the primary reasons he decided to build aerodynamically clean composite wings, and it led to some intensive fairing work. This was especially tricky at the ends of the wing struts because the fairings had to be capable of sliding away from the intersections to allow the wings to fold.

The paint job and trim scheme duplicates the one on Myron's Glasair III, and its understated elegance works just as well on the GlaStar. However, Myron says he likes the wild trim schemes the new multi-glitter paints now make possible, and if he had it to do over, he'd hire a professional to make the airplane a real mind bender.

It took Myron about two-and-a-half years to complete his GlaStar, dividing his construction time between the family cabana that overlooks the Colorado River in what passes for winter there and their Arizona mountain cabin during the summer months. Other builders continue to be amazed that Myron paints his homebuilts in the open (on his cabana) in the normally dusty desert air. There's no mystery to it, however. The desert dust is extremely fine in texture, and he simply sands and buffs it out of the surface layer of paint.

When finally ready to fly in November 1999, the GlaStar tipped the scales with a 1,261-pound empty weight. That, Myron feels, compares quite favorably with the weights of other GlaStars he's familiar with that have smaller, lighter engines.

At Sun 'n Fun 2000, the airplane's first major public appearance, the GlaStar cruised at 175 mph at 2550 rpm and 9.5 to 10 gph. That was with a prop that needed a little more pitch, so he's hoping for more speed when the 2000 fly-in season is over and he has a little more bite carved into it. Lightly loaded, the airplane's initial rate of climb is around 2,000 fpm, and it can sustain 1,000 fpm for quite a while at maximum gross weight. Fortunately, the 2-to-1 aileron differential Myron initially dialed in turned out to be right on the mark.

Just one significant problem surfaced when Myron began flying his GlaStar. The engine always fired right up, but it "didn't sound right" at cruise and wouldn't idle at less than 1100 rpm—which made landings quite an adventure in so clean an air-

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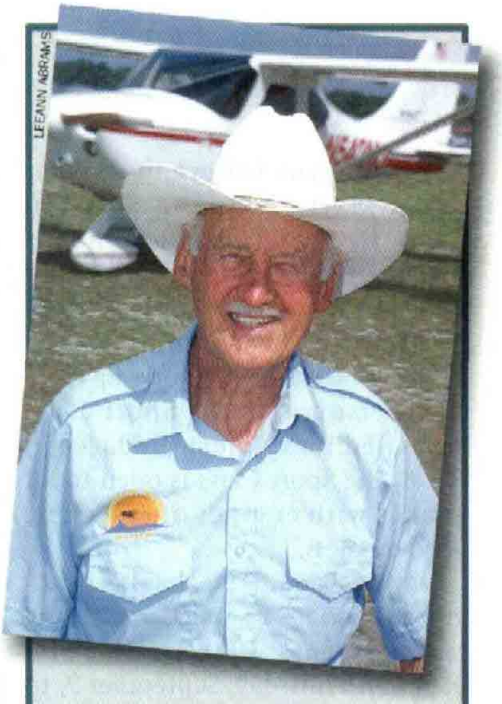
plane. Myron tried all sorts of adjustments, all to no avail, and finally called Lycoming for advice. A mechanic there listened to his tale of woe and immediately diagnosed the problem as a leaky intake manifold.

Following the mechanic's instructions, Myron plugged the hose from the outlet side of his vacuum cleaner into the injector inlet to pressurize the manifold, and then he began pouring soapy water around all the O-ringed connections. Sure enough, one of them started blowing bubbles, which led to the discovery that he'd crimped and cut through an O-ring when assembling the engine after its overhaul. When he replaced the O-ring, the engine idled perfectly at 650 rpm and ran smoothly throughout its rpm range. Myron advises fellow homebuilders to check those O-rings if they're having a similar problem and to be very careful when installing new ones.

A question that had to be asked was how Myron was coping with stepping out of a fire-breathing hot rod like a Glasair III and into a docile little all-purpose sportplane like a GlaStar—even with 200 hp in the nose. Quite well, it turns out. Myron says he finds it to be more stable than the Glasairs, and at 175 mph it's still a very capable cross-country airplane, especially with its generous fuel capacity. All of that, however, pales into insignificance when we learn the main reason he is pleased with the airplane.

"My wife, Marie, loves it, and that's a big plus. She's never been comfortable with the high landing speed of our Glasair III, so she thinks the GlaStar is great. That's why she flew with me to Sun 'n Fun this year. She wouldn't have come with me in the III."

Slow(er) can be beautiful, guys. EAA



LEEANN ABRAMS

Myron Jenkins

Myron Jenkins is a transplanted Iowan. He grew up in the Hawkeye State in the 1920s and 1930s, but he left home in the early 1940s to serve his country during World War II. Afterward, he settled in Los Angeles and started a business that manufactured and installed marine electrical equipment. It was so successful he was able to retire at 45. He and his wife, Marie, moved to Parker, Arizona, and have been living there ever since—except for the summer months when they opt for the cooler temperatures at their mountain cabin.

Always interested in flying, Myron finally got around to taking flying lessons in the early 1980s and soloed in both a Cessna 152 and 172. He stopped flying when he began building his Glasair RG, but he obtained his private certificate in the airplane after it was completed. An innovator and a true craftsman, all three of Myron's homebuilts have been multiple trophy winners.