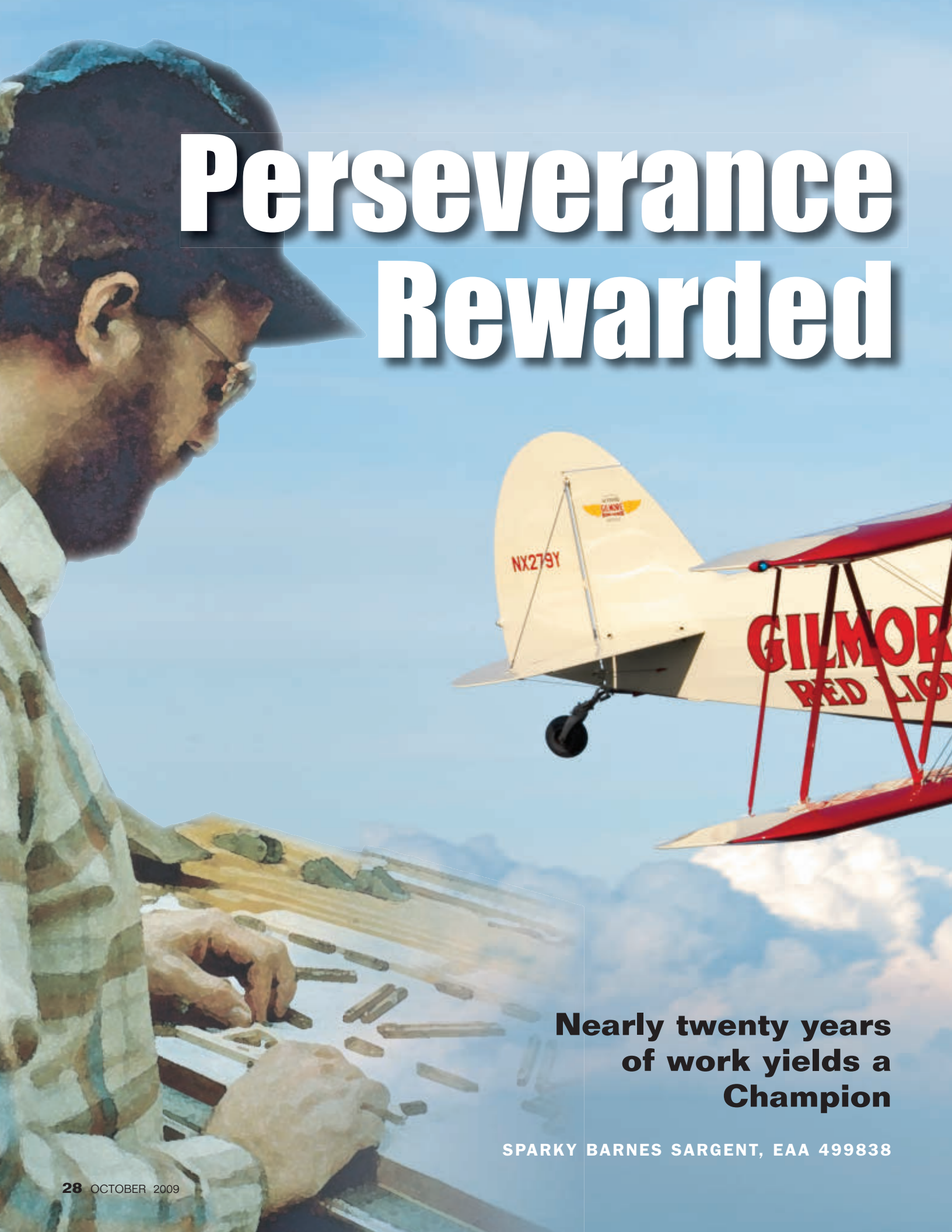
Perseverance Rewarded



Nearly twenty years of work yields a Champion

SPARKY BARNES SARGENT, EAA 499838

Bonnie Kratz

Mark Gilmore's Marquart Charger, the *Gilmore Red Lion,* made its impressive debut at AirVenture 2009. Charging across the AirVenture sky, or sitting quietly in the homebuilt area, it reflected elegant precision and quality craftsmanship in every detail.

Mark would accept nothing less than superior workmanship, even with details that would normally be concealed behind exterior panels, such as this wire bundling.

"I went through 300 sheets of sandpaper in various grades, just on the wings alone . . ."

NX279Y attracted scores of appreciative admirers, and the Gilmore family was a bit overwhelmed with the accolades, since their lives have been so closely intertwined with the biplane project. "The last several days have been unbelievable in the amount of compliments that have come," Mark said. "You're kind of in a vacuum when you work on a project; you really don't realize what you've done until other folks come around and critique your work."

The genesis of the project was actually long ago, in the early 1980s, when Mark, EAA 322796, was flying radio-controlled airplanes at the airport in Anderson, Indiana. Tom Ferraro gave Mark a ride in his Skybolt. That flight planted the biplane seed, and years later, Jim Wright, a fellow EAA Chapter 226 member and Hatz builder in Anderson told Mark about a fuselage that was for sale. It happened to be a Marquart Charger. Another EAA friend, Mike Finney, lent him several old EAA magazine articles about the Charger. That did it.

Mark, a manufacturing engineer, bought the fuselage in October 1987, which, he says, "was a blind leap of faith, because other than the articles, I had no idea what it was, or how it flew. I'd never seen one, and it wasn't until 1992 that I ever got a ride in one—and it wasn't until 2006 that I even got to fly one. I wondered if I could build it, but I had seen other guys building airplanes, and thought, 'Well, if they can, I can.'"

Welding and Sheet Metal

Designed by the late Ed Marquart of EAA Chapter 1 at Flabob Airport in Riverside, California, the plans-built Marquart Charger consists of wings constructed with built-up wood ribs with wood spars, a steel tube fuselage, aluminum formers, and screen-door channel stringers. About 500 sets of plans have been sold for the MA-5 Charger, with an estimated 100 completed.

Mark was comfortable working with wood, but he had other skills to learn. He attended welding workshops at AirVenture and also learned firsthand from Mike Finney, who coached him and welded some of the more difficult parts of the airframe. Mark's next challenge was learning how to work with sheet metal, the prospect of which he found rather intimidating.

"Again, a fellow EAA chapter member, Jerry Groshong, helped me learn the ins and outs of working with aluminum," said Mark, "such as how I needed to deburr it, to Cleco, what my rivets needed to look like, how to back rivet, and things like that," said Mark. "I used carpet tubes and pieces of carpet on the garage floor, rolling it back and forth to get the curve of the aluminum just right, and learned how to bend the aluminum in a sheet metal brake. All the aspects of the aluminum work have been the most gratifying part of the project."

Dope and Fabric

The Charger is covered with Ceconite and finished with Randolph nitrate and butyrate dope. Close inspection reveals neatly applied pinked-edge tapes and a lustrous finish, which was achieved by painstaking sanding after each coating was applied. "I went through 300 sheets of sandpaper in various grades, just on the wings alone," chuckled Mark. "I wore a respirator and used compressed air for painting, and worked in a two-car garage with an old furnace fan as an exhaust fan. I put plastic over my tools in the garage to protect them from overspray."

TOP: Brett claims his seat in the Charger. Mark said working with sheet metal was one of the most intimidating skills he had to learn.

MIDDLE: Mark's mom, Sandy, stitched the upholstery.

BOTTOM: What started with Mark's "blind leap of faith" in 1987, soon filled the garage and house with bits and pieces of the sport biplane.

All in the Family, All Through the House

Since Mark didn't have a workshop or hangar in which to work on his project, he made his house and garage suffice—with help from his family. Mark's wife, DiAnn, a safety manager, said she willingly supported his efforts by allowing parts and pieces throughout the house in every corner. "He's the craftsman and perfectionist, and I knew that it had to be done the way he wanted it done. So I encouraged him, and pretty much kept out of his way," DiAnn said. Smiling, Mark reflected, "Even today, we don't have a dining room table, because the wings always occupied the dining room. She's been great and very tolerant of my hobbies—and we just had our 31st wedding anniversary."

The Gilmores' son, Brett, and daughter, Jama, literally grew up with the project and thought it was quite normal to have an airplane in the garage instead of a car. As they grew older, the Marquart Charger languished for periods of time, as Mark and DiAnn followed their children's interests in various sports. And yes, there were times when Mark wondered if he was doing the right thing by hanging on to the project. "But then it became a life lesson for the kids," Mark explained. "If it's worthwhile, then it's worth finishing."

When Brett was a junior in high school, his parents took Jama to college in Rhode Island, leaving the teenager to tend the home fires—quite literally, as it turned out. About 3:00 a.m., Brett discovered fire and smoke in the house. He called the fire department and dragged the Charger wings out from the garage. Then he woke a neighbor, who helped him get the fuselage out, just as flames were breaking through the top of the house. Thanks to Brett's quick actions, both the biplane and the house were saved.

Patient Persistence

Mark's enormous reservoir of patience, combined with his personal high standards, yielded excellence in workmanship. It was, he said, "really a matter of choice—I asked myself, 'Is that the best I can do?' And if it was not, I needed to do it over. I needed to satisfy myself. And I tried *not* to say, 'Is that good enough?' That was probably one of the goals—just to be happy with everything I did. I took a lot of teasing from a lot of folks, who asked, 'Are you ever going to get this done? You need to quit what you're doing and just finish the airplane.' I resisted that for the most part."

Brett Gilmore, left, and Jon Hubbell get a little dirty while polishing the Charger's prop just before AirVenture 2009.

Jay Tolbert

Simple VFR instrumentation, flawless hardware integration and vintage-looking lighting round out the details on Mark's award-winning Charger.

Mods

Mark incorporated a few modifications in the Charger, primarily for comfort and aesthetics. He raised the rear instrument panel by an inch and the top of the turtledeck by an inch-and-a-half. "I did that because I was a bit taller," he said, "and I wanted to be a part of the airplane and not sitting on it. I also changed the vertical fin shape just slightly, but pretty much the structure is built to plans."

Powered by Lycoming

A fellow chapter member sold one of his Twin Comanche engine cores to Mark, and he rebuilt the 160-hp IO-320 in 1992. It was a good match for the Charger, which has a total fuel capacity of 27 gallons (18 in the fuselage tank and 4.5 gallons in each wing), and a fuel burn of 8.5 to 9 gph at 2450 rpm.

"In essence, it was a new engine," said Mark. "I didn't have the test stand available, so it was one of those situations where you've got a new engine, a new airplane, and chrome cylinders to break in—and all of the potential problems that go along with that. We did a minimum of test running, and we did fuel flow and oil leak checks. I had done a couple of high-speed taxi tests before I flew the airplane."

Finishing Touches

Mark's surname was a springboard for the ultimate paint scheme for his Charger. He said, "The Gilmore Oil Company was founded in the 1930s, and since our last name is Gilmore, we thought it'd be kind of neat to tie into that. Roscoe Turner was sponsored by the Gilmore Oil Company, and they had the lion logo and their gasoline was red—hence the Red Lion. Also, we live in Muncie, Indiana, and when Roscoe Turner retired, he went to Indianapolis and opened a flight school. So there was a connection to Indiana, and we thought, 'If Roscoe Turner had a biplane, what would it look like?' That was the idea behind it all."

Brett, who recently graduated from college with a manufacturing engineering degree, applied some of his digital skills to help with the finishing touches for the Charger. Using AutoCAD to make a 3-D model of the wing for the paint scheme, he was able to find a combination of a half circle and half ellipse that allowed the tips of the scallops to follow the rib line. That was a bit of a challenge, due to the biplane's swept-back wings and diagonally spaced ribs. He also modified the name and jumping lion graphic from a picture on an airplane model box, making its lines crisp enough to be airbrushed by artist Jamie Matthews.

Mark used Excel software to lay out the graphic for the vertical stabilizer. That emblem was a creative fabrication of a "company logo," in keeping with the early 1930s style. Mark explained, "The wings are similar to period logos, part of the Gilmore slogan was the 'Record Breakers,' and the biplane was built in the 'Buckeye Plant' because we live on Buckeye Road. It was manufactured by G&F Wingworks, which stands for Gilmore and Finney—because Mike Finney's wife, Sherry, did the rib stitching. That whole logo is made up."

Mark asked his mother, Sandy, to sew the upholstery for the seats, headrest, and smaller items such as leather

The Gilmore-Turner Connection

Jay Tolbert

When your last name happens to be Gilmore, you have no choice but to adopt Roscoe Turner's theme. Sponsored by the Gilmore Oil Co. during the 1930s, the colorful racing pilot emblazoned his aircraft – and chase vehicle – with the Gilmore name and symbol – the Red Lion. Mark's son Brett helped digitize the Red Lion graphic so it could be airbrushed onto the Charger.

Sunset after Mark's first flight in the Charger on October 6, 2008.

covers for control cable and fuel line exits. She agreed to the task, and he purchased an industrial sewing machine for her on eBay. Then, instead of buying an entire hide for leather, Mark turned once again to eBay, where he "bought red leather skirts and pants that I could get cheap and cut them up for pieces of leather."

A subtle, yet distinctive bit of embroidery exemplifies the Charger theme. One of Mark's coworkers drew the outline of a charger—a man on the back of a horse in shining armor, with a lance in hand—and Mark had the design embroidered in red thread on the pilot's headrest.

Rollout and First Flight

August 23, 2008, was a noteworthy day. Mark recalled, "We had this rollout party to let family and friends see the big pieces of the biplane all put together. It was hangared at Mike Finney's, and I was still painting parts that morning. When I went over to his hangar, he had it rolled out onto the grass, and it was really the first time I saw it outside. It was holding its own wings up and was there in all of its glory—it was pretty emotional for me."

Mark first flew the biplane on the evening of October 6, 2008. "I had offers from Mike Finney to do the first test flight because I had invested so much time and energy into it," recalled Mark, "and there's always some question that if something begins to happen…am I really thinking about saving the airplane or preserving myself? If you're not attached to the airplane, then maybe you'd make different decisions."

Yet Mark felt confident in his abilities, due in part to the manner in which he prepared for the flight. "I had been up in my son's Taylorcraft L-2, and our local airport instructor has a flat-engine Great Lakes, and then the chapter members offered their Hatz biplanes and a radial-engine Great Lakes to help me get really acclimated to flying a biplane. I invited my friend Mike Finney, who was our technical counselor and flight advisor; Jim Wright, who is the EAA technical counselor in Anderson, Indiana; my good friend Jon Hubbell; and my family to be there for the first flight. We had fire extinguishers available when we started the engine and a chase plane to fly along with me to observe the biplane in flight. We're out in the farm fields of Indiana, and I was wearing a parachute and had lots of options and places to go, other than returning to the airport."

That first flight lasted 40 minutes. "Everything went fantastic, other than when I took off—I had a ball cap on under my headset—and when I raised my head up, my headset landed in my lap!" laughed Mark. "But I kept flying the airplane and went up and circled the airport. The three-point landing on Finney's grass field couldn't have been any better. All those years, waiting for those two moments, and it really couldn't have gone any better."

Crowning Glory

After nearly two decades, Mark's Marquart Charger symbolizes many lessons learned. Brett and Jama certainly have had the principle of "If it's worthwhile, then it's worth finishing" thoroughly

demonstrated by their father's example. And throughout those years, his staunchest supporter, DiAnn, said she "knew it was going to be gorgeous."

"I am extremely happy with the way it turned out and am more than happy to share it with the other people, because I know I have spent so many years coming to AirVenture and trying to find just one example of what I was building," Mark said. "I was so disappointed because there weren't any here, so then I would go to any biplane and try to gain ideas that I could incorporate in mine. Now it's my turn to pay it back, and let those next guys raise the craftsmanship bar."

When Mark flew his Charger to AirVenture this summer, Brett was his "navigator," flying his L-2, the gift his parents gave him when he graduated from high school. Admittedly, the Charger was flying circles around the Taylorcraft, and the flight lasted five hours. From the very beginning of the project, the biplane has been all in the family, all through the house… and now it has charged into its rightful place in the sky. So it was no surprise that DiAnn and her mother, Marilyn Petrie; Jama; and Mark's parents, Herb and Sandy Gilmore, were all on hand to welcome father and son to the show, and celebrate the *Gilmore Red Lion*'s debut.

The judges joined them in that celebration, crowning this resplendent biplane with the Grand Champion Plans Built - Gold Lindy award.

Sparky Barnes Sargent holds a commercial glider certificate with a private single-engine land rating, and she personally restored her 1948 Piper Vagabond. She was the first female recipient of the Bax Seat Trophy (2006). Her first book, a collection of women pilot biographies entitled A Hunger for the Sky, *was published in 2008.*

watch the video

2009 Grand Champion Plans Built
www.EAA.org/video/Gilmore