

Blueprints and Bonds

A father-son airplane project

BY HOLLY CHILSEN



IN A TOWN WITH a population of about 5,000 people, Poplar Grove, Illinois, has everything you'd expect to find from small-town living. It's charming, quiet, has a close-knit community, and is the perfect place for family life.

The bonds of family are exactly what this story is about. Oh, and an airplane, of course. But for one father-son duo living in an airport community, there's extra pride in their Sonex Waix, knowing they built the airplane together, making memories and learning from each other along the way.

Where the Dream Began

To bring this story together, you'll have to venture back to when Bryan Cotton, EAA 334242, was growing up in Connecticut. That was when his passion for flying began — a passion introduced to him by his father, who was, at the time, a flight control engineer at Sikorsky Aircraft in Stratford, Connecticut.

"I was kind of brainwashed from an early age to be into aviation, and my dad was a real pilot," Bryan said. "He got his instrument/commercial rating, and he was in a couple of flying clubs. We also did a lot of radio control together. It started back when I was 5 or 6 — you know, the whole model airplane thing. And we spent a lot of time together doing both building and flying."

When Bryan was 12, his father brought home a Pitts Special information pack. That struck Bryan's interest in building something on a much grander scale.

"A Pitts Special is — especially when you look at the prints and stuff — it looks really the same as building radio controls," Bryan said. "In my 12-year-old mind, I'm like, 'Holy cow! I could do this.

That would be really cool!' Especially when you're 12, you're kind of oblivious to the challenges of it. So, I was kind of excited about it."

However, as it tends to do, life got in the way.

"After a couple of weeks, the Sikorsky Black Hawk program was really kicking off, and there was not a whole lot of time that my dad had to spend on hobbies and everything as things got crazy at Sikorsky," Bryan said. "Evaluating that, and responsibilities, and himself, he decided that was going to be too much of a project. I was really bummed that he wasn't going to do it because I thought we would."

Some years later, Bryan got his foot in the door, literally, at Sikorsky as well.

"I actually started at Sikorsky as a security guard when I was 18," he said. "Then, after school, I hired in full time. That was about 35 years ago."

Like father, like son, it was the electrical engineering field that called to Bryan.

"I also did flight controls at Sikorsky," he said. "A lot of fly-by-wire. Then, [I] had a few career twists and turns. I actually totally changed disciplines and went to do E-testing. Got recruited back to fly-by-wire. Then Sikorsky built this aircraft called the X2 Technology Demonstrator, which is kind of like a forerunner of all the newer coaxial high-speed rotorcraft that they'd been building for various Army contracts and stuff. I did the fly-by-wire on that, which is why I moved myself and my family out to New York."

When Sikorsky closed all its facilities in Chemung County, New York, to move the military completion work to their West Palm Beach, Florida, facility in 2012, Bryan had options to consider. He could go back to Connecticut or move down to Florida.

"I didn't really feel that either choice was the best choice for the family," he said. "I thought the Midwest would be

a better opportunity for the family. I pursued a couple [of] other opportunities within the corporate umbrella. It was United Technologies back then; it's now RTX Research. I saw some good jobs in Rockford, [Illinois]."



While working on an EAA chapter restoration of a 1946 Cessna 140, Bryan connected with Lorraine Morris, EAA Lifetime 1136221, who happened to be active in the Cessna 120-140 Association and lived in Poplar Grove.

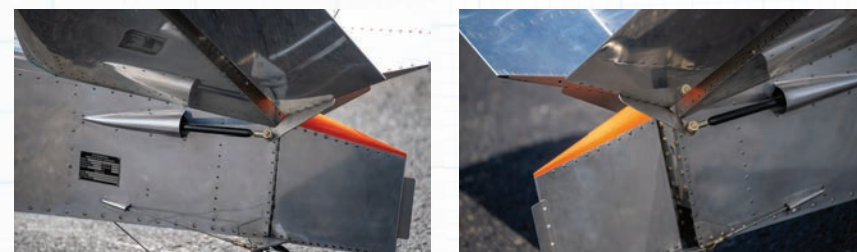
"I'd never met Lorraine, but we had both talked through the forums and emails and bought, sold, and traded Cessna 140 parts," Bryan said. "On a whim, one time I asked her, 'Hey, Lorraine, what's Illinois like to raise a family and stuff?' But it just seemed like already having talked to Lorraine about Poplar Grove, I came out for an interview. We found a condo here in the neighborhood, and it just seemed like a pretty good deal. So, we moved into this flying community where Lorraine and Ken Morris, [EAA Lifetime 58044], live. So, that's how we got to Poplar Grove."

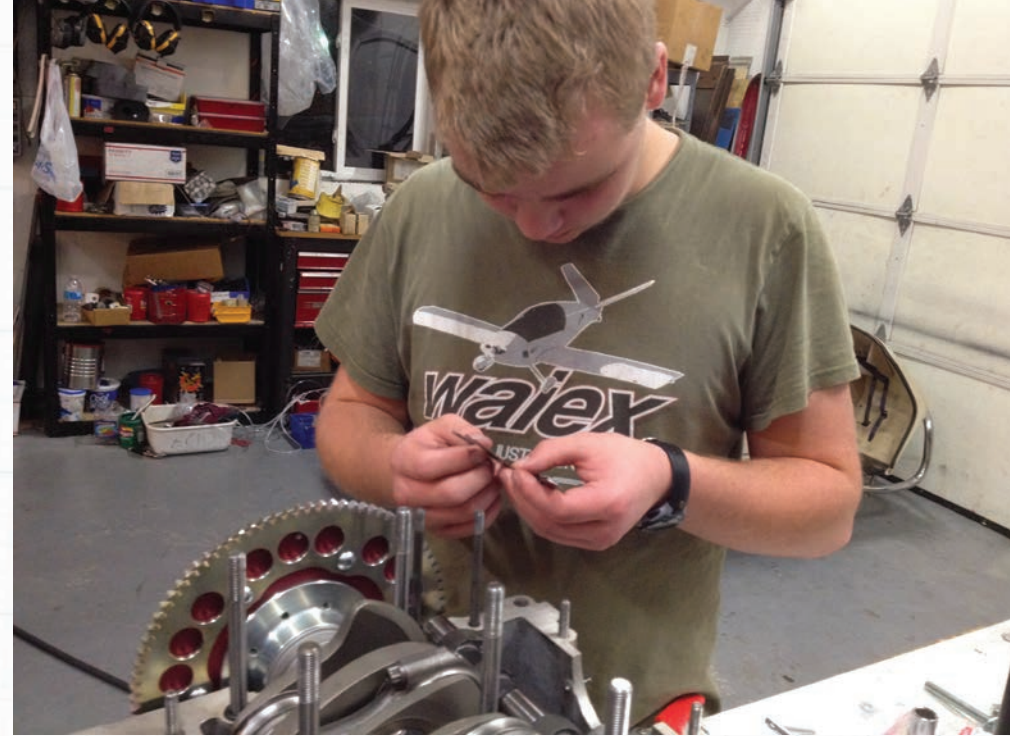
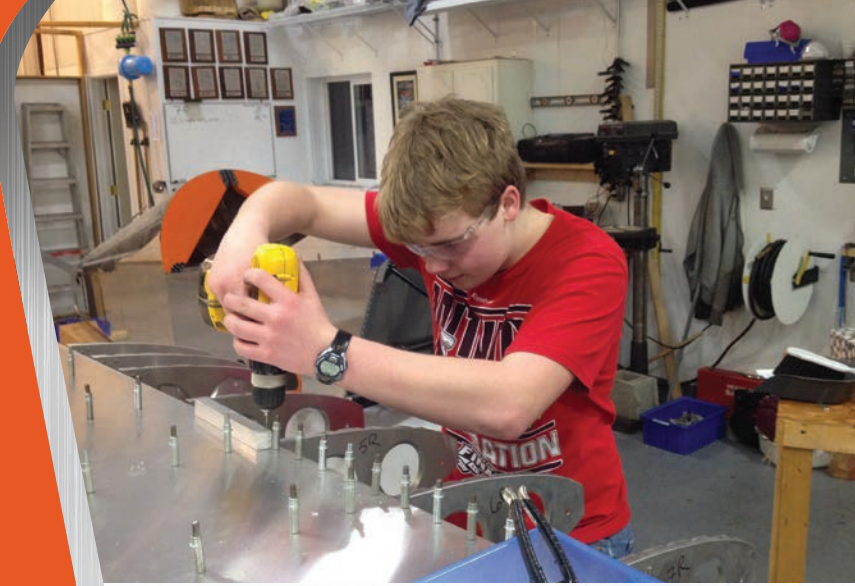
Decision Time

After settling into their new home in the Midwest in 2013, Bryan was renting airplanes to fly, to scratch that itch to get some time in the air. His son Adam, EAA 1269251, recalled that it was around that time his father pitched the idea to build one.

"To afford to fly the rental airplanes two times a month, it really wasn't enough to keep proficiency," Adam, now 22, said. "So, we kind of came to the decision that it was time to get an airplane."

But Bryan wanted to dedicate more time to completing a project he had in the works.





“When we moved here, I had a Hummel Bird project that had been on the back burner, and I was going to pull it off the shelf,” Bryan said. “I offered Adam the chance, Adam and Matthew really. My younger son didn’t have the interest with the Hummel Bird. Adam asked, ‘Would you rather build something or buy something?’ I said, ‘You know if we build something, there are slight advantages because it’s cool that you can build it. It would probably take a couple [of] years, versus buying something.’”

While Adam agreed there would have been the quick satisfaction of simply buying an airplane, he was up for the challenge.

“I think initially I was maybe leaning toward [buying], but I watched enough videos about it and really got sold on the idea of building something,” he said.

But Bryan said the Hummel Bird really wouldn’t have been the way to go when doing the build alongside his young son.

“A single-seat experimental scratchbuilt, though it’s great therapy for middle age, for a 12-year-old, that offers almost nothing,” he said.

One day, during a family outing to Janesville, Wisconsin, the wheels in Bryan’s head started turning when he got a glimpse of a Waix flown in by one of the locals, Tim Stearns, EAA 589841.

“He also has a Waix — a really cool polished one with red, white, and blue,” Bryan said. “He was on the ramp there, and we went and checked it out, and I’m like, ‘Wow, that looks really cool.’ That planted the idea in my brain.”

For Bryan, the Waix takes the Sonex up a notch.

“One of the things I really wanted in building an airplane is something that I could do aerobically in,” he said. “I picked the Waix partly because of the ease of building, with the laser-cut sheets and the prelocated holes and everything. Then, also, it had two seats, so it really had more to offer my son who wanted to build.”

And, so, it began.

Bringing It Full Circle

Any sort of big project isn’t without its fair share of challenges. Determination is a key component. Bryan was certainly determined to see the Waix through to completion.

Some of the challenges, Bryan noted, were self-induced.

“Had to replace one of the spars in the tail,” he said. “It was all nicely built and everything, went to install it and screwed up the hole, and those are really important parts. There’s no, ‘Hey, that’s good enough.’ We had to redo that.”

Despite the challenges, they pushed through.

“I think that the hardest part of the build was just the perseverance because even with

all the predrilled holes and the prebuilt spar that we bought, and a couple [of] other things to help speed the project along, there’s always so much to do that, to actually get all the way to the end, you just can never give up,” he said.

There was a definite learning curve for young Adam. The entire build process was hands-on, so he learned a lot as they went along.

“I’m 12 or 13, not knowing how to really use the tools properly,” he said. “Needed a lot of supervision. But after the first six months, it actually got to the point where my standard of work increased to where we would go and work at the hangar together, and for every one hour we’d be getting close to two man-hours of work done because he’d send me to work doing all these rivets and all the deburring.”

Yes, Bryan designated Adam as “chief riveter” early on.

“It was a really good investment in Adam because I really put him to work right away doing real work,” Bryan said. “He actually set the majority of the rivets in this aircraft.”

It was a constant picking up of skills along the way that Bryan said set Adam up for success in his mechanical engineering career.

Perhaps the part of the airplane that Adam can take the most pride in is the engine. He is the one who built it — under Dad’s supervision, of course. It’s an 80-hp, naturally aspirated AeroVee engine.

“I learned how to read blueprints and how to interpret drawing views,” Adam said. “There’s a big packet of drawings you get from Sonex with the assembly instructions, so that was my first exposure to that at 12, 13. Still use that today.”

Perhaps the part of the airplane that Adam can take the most pride in is the engine. He is the one who built it — under Dad’s supervision, of course. It’s an 80-hp, naturally aspirated AeroVee engine.

“That was my first exposure to anything automotive or the internal combustion engine,” Adam said. “Because, at that point, before we built the engine in the project, it was just all building sheet metal and riveting it together, which gets old after a while. But the engine is a totally new thing.”

They assembled the engine from a kit. The kit came in two case halves.

“It was just an excellent experience that really solidified for me how an engine works,” Adam said. “And to have that knowledge today, it helps with car troubleshooting and just general knowledge. I believe that if you’ve put an engine together, you get a little bit more than if you’ve just watched YouTube or read a book.”

Bryan said the low-performance engine makes it similar to a Cub or a Cessna 140.

“Because the airplane is so light — we’re about a 670-pound empty weight — the performance is good,”

he said. “It’s not a rocket ship in terms of taking off, especially at the higher weights and high-density altitudes.

However, we’re getting 100 knots cruise, 4 gallons an hour, and it’s been really reliable [and] easy to work on.”

In terms of the instruments inside the cockpit, Bryan called it the ‘ultimate scrounge job’ by making

sure the final necessities for a completed airplane were budget-friendly. The digital

instrument panel is a Brauniger ALPHAMFD.

“It’s about 2 pounds, and it does all of my VFR air data and engine instrumentation, given to me by a friend who had dropped it and shattered the black LCD,” Bryan said. “I shipped it back to Germany and had it fixed. That was going to go on my Hummel Bird, then we got [the Waix].”

The transponder is an old KT-76A, and the radio is a KX-155 nav/comm that Bryan bought from a friend. He said another interesting piece on the airplane is the VOR antenna on the tail to go with the radio.

“If you look closely, it’s actually a couple of Saturn car antennas,” Bryan said. “We have a couple [of] Saturns in the family. I fabricated that up, designed it, 3D-printed some parts. I built a balun to get the right impedances and stuff like that. A lot of homebuilding type stuff there.”

Using his thrifty ways, Bryan took to eBay to get those perfect pieces to really make the airplane his own, like the compass.

“I wanted a real aircraft compass,” he said. “A lot of people just get one of those stick-on, suction-cup boat compasses because that’s really all you need to be legal. Then, the g-meter I found on eBay, and then I also found an old Cessna turn and bank coordinator on eBay. A funny thing: We were in Kenosha, [Wisconsin], and they have a little

aviation museum in the terminal, and walking around looking and here’s the avionics part, and it’s like, ‘Hey, there’s our turn and bank coordinator. We’re a museum piece!’ That was funny.”

The airplane is also equipped to fly at night.

“We have Whelens Orion wingtip lights,” Bryan said. “We’re in the process of putting ADS-B in it right now.

Unfortunately,

because the Whelens have the out-facing nav light, we didn’t put in the wiring and

everything for a tail-mounted nav light when we were building it. That would’ve been a lot easier. We got the wiring in there, and Adam is CNC-ing up some parts to adapt it for the Y-tail since we don’t have a straight up-and-down vertical tail.”

Proud Moments Shared

As alluded to in the beginning, it’s the bonds of family that make this story truly special. Being able to share your passion for a project with someone you love makes the time spent that much more rewarding.

In this case, what was planned to take two years to complete ended up taking nine years. But that’s not taking away from the joy this father and son got out of the entire experience.

“It was an excellent experience, this whole project,” Adam said. “It was sold to me as two [years], and then four and then five. And then you get other side projects. You often hear in the homebuilding hobby, you get to the 90 percent done stage. You know, around probably 2016 [or] 2017, it looks pretty much like this. But I don’t regret any of the time — both man-hours or calendar time — that was invested getting this done.”

Bryan said the most rewarding part about this build was doing it with his son and being able to extend his hobby more broadly into his family.

“I felt confident in my ability to teach, and [in] Adam’s abilities to actually do,” Bryan said. “He really did a lot.”

Bryan noted that he had a lot of fun teaching.

“Whether it’s building an airplane or even at work at engineering, teaching young people is really even a little more rewarding than doing it yourself,” he said.

So, how does N191YX handle? Bryan calls it “a delight” and “the easiest taildragger he’s ever flown.” He just had to get past the nerves and into the air for that first Waix flight.

“Taxiing down the whole time, I’m like, ‘Oh my God, I’ve really got to do this,’” Bryan said. “It was really nerve-racking right up until I pulled onto the runway and firewalled the throttle. And then, all of a sudden, I didn’t think about that anymore. I was just flying. Single place, it performed really well. Climbed up, and it’s just a snappy little



airplane. Did a bunch of steep turns, flew for about half an hour, came down, and the first landing was really easy. Ended up doing a wheel landing and just gentle touchdown, and that was it. The first flight was over.”

As a spectator from the ground, Adam was also battling some nerves for the maiden flight but was proud to be able to witness the spoils of his labor.

“It was just a really good feeling to see that nine years of hard work flying,” he said.

After that, it took about four more months to get through the 40 hours of Phase I testing.

“And then in December of 2022, we went up dual for the first time,” Adam said. “And that was the real fun because I actually got to fly it.”

To bring things full circle, in 2023, Bryan and Adam flew 430 nm from Poplar Grove to Tennessee, where Bryan’s father lives.

Bryan said the full-circle, family moment really hit him during the long trek.

“I’m like, ‘You know, this is really cool. Here we are, we built this thing and we’re flying in it,’” he said. “It was really the same feeling that I had flying with my dad, except that it was also the fact that I’d flown down for my dad. ... He’s in his late 80s. I’m really glad that I did it when we did. The mission was really to get my dad in the airplane. It really felt good to put that check in that box.”

Bravo to a project well done. The culmination of years of shared passion and countless hours of dedication is something they can cherish for years to come. *EAA*

Holly Chilsen, EAA 1495056, is EAA’s social media manager. She creates content for EAA’s social media channels and writes for EAA’s print and digital publications. When she’s not learning about aviation, she’s cooking up her latest delicious creation in the kitchen. Email Holly at hchilsen@eaa.org.

