

PARENTING A PULSAR

Finishing Couches

It's said that a project like a homebuilt airplane is never over until it's over. I've got another take on it. Simply put, it's really never over. At least, that's how it is with my Pulsar. In the most recent installment here (see "Parenting a Pulsar: Graduation Day," July 1995 *Pilot*), you may recall that flight testing had just concluded and I looked with great anticipation to being able to use the airplane as a transportation tool rather than a receptacle of time and money. Yet in the swelling of emotion that accompanies the conclusion of flight test and the newfound ability to travel with passengers, I had overlooked something terribly obvious—there was still a lot of work to do. ■ Eagle-eyed readers will recall from the previous round of photos that the canopy frame was unpainted during flight test and that the interior furnishings

**One year after
first flight and
this Pulsar's
nearly done**

BY MARC E. COOK





amounted to a seat pad and a (brightly colored if not luxurious) beach towel. My Pulsar wore no wheel fairings and had duct tape sealing the wing and fuselage junction. Many other small cosmetic items—almost too picayune to write onto my ever-growing legal pad of deferred duty—remained on the “to do” part of the list. Even though I’d managed to get the airplane flying in less than 1,000 hours, it was by no means complete.

I started on the big items. The canopy frame, as any Pulsar builder will tell you, is a tedious and time-consuming construct. No two seem to fit the same, and there always seems to be considerable body work needed to make the wood-and-glass frame fit the fuselage properly. Even now I’m not sure that I could do a second one much better; that’s not true of the rest of the airplane, incidentally. In my case, there was a

small amount of body work to be done and much sanding, masking, priming, and painting. Over the course of a month, the canopy frame turned overall gray and then finally Vestal White, like the rest of the airplane. (Imagine my horror when the newly painted canopy was first remated with the fuselage and I realized that they were distinctly different colors. In time the canopy paint would cure and match the fuselage, but it was a tense few weeks.)

For the inside of the canopy frame I used a product that many a homebuilder has discovered to be the next best thing to a weekend in Baja—Zolatone. A thick, speckled paint, Zolatone covers fiberglass weave and sticks sufficiently well to be forgiving of less-than-surgical preparation. Its mottled texture helps to conceal minor surface flaws and generally to draw attention away from the area. (I briefly considered doing the whole air-

plane in Zolatone.) In a dark gray with purple and green speckles, the Zolatone I used for the inside canopy rail looked great. If you use the stuff, just remember to remove any masking tape before the paint cures fully; I had to retouch some areas where the hardened paint pulled away with the tape.

Many small items that you take for granted in a production airplane obviously must be installed by the builder in a kitbuilt. Take door locks, for example. Once again depending upon the inspiration of others, I stole an idea for securing the canopy from another Pulsar that I saw at Oshkosh. It involves embedding a baggage-door lock mechanism in the side of the fuselage next to the trailing edge of the canopy. A small metal tab comes out and engages an aluminum plate on the canopy frame. Sounds simple enough, right? But fabrication took a couple of days of noodling, filing, fitting,



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and gluing, just to get from a lockless Pulsar to one with some form of security. Seems hardly worthy of mention, but details like this really eat into post-flight-test flying time.

In any homebuilt airplane, there comes a time (many of them, really) when you must admit that the task at hand exceeds your abilities. That's why I farmed out seat cushions and cabin fur-

nishings to Sky Interiors at Long Beach Airport. In a remarkably short time, Bert Kuroiwa and his crew turned my fiberglass sow's ear into a silk-lined treasure. Well...fine...not silk. Actually, the thick and slightly spongy side-panel material—which is simply glued to the sidewalls with contact cement—has proven to be comfortable and durable. It's also helpful in cutting the high interior noise level. (Riding in the Pulsar is still a bit like sitting inside Pete Townsend's amplifier at a Who reunion, but better than before.) Simple two-piece seat cushions attach to the bulkheads with hook-and-loop tape, and the carpet is the same as that which Beech used in the Duke. With a real interior in the airplane, I could give rides without issuing a flurry of apologies first.

For the longest time I resisted fitting N212MJ with wheelpants. Why? Mainly I was really, really tired of prepping fiber-

glass for paint. And while the supplied fairings were already gel-coated (unlike the rest of the prepreg-fiberglass airframe, incidentally), there was still a bit of bodywork to be done. A central seam needed to be sanded down, and the inevitable pinholes and voids would require filling. Then I'd have to cover them with a primer that I knew would be compatible with the finish coat; then, more sanding. Because I'd used hydraulic brakes in place of the standard mechanical brakes—they were the supplied items when I started my airplane, but are no longer—the first-generation fairings would be a tight fit. In addition, I had inadvertently placed the brakes' wheel cylinders in the ideal location for bleeding the system, but also in direct conflict with one of the aluminum fairing mounts. Ultimately, I got a set of the larger main-gear fairings—a bit taller and wider than the others—that fit my



wheels and brakes quite well.

After seeing the airplane with wheel-pants I was amazed how much more *real* it looked. Somehow the mere addition of the fairings completed the appearance and made the Pulsar seem more substantial. Moreover, the fairings boosted cruise speed by three to five knots, depending upon altitude. Rate of climb increased slightly, too. I chided myself for not having completed the wheelpants sooner. At the same time, I took the opportunity to rework the prop-blade cutouts in the spinner; in a flurry of last-minute chores, I had rather crudely made room for the blades through the composite spinner. Although the resulting gaps probably had little aerodynamic effect, I considered them eyesores. More filling, sanding, priming, and painting ensued.

Preparing and installing the wheel fairings and spinner was partly complicated by a move of the airplane from

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private to shared hangar space. Because the project had reached the more-flying, less-building stage, I thought it prudent to seek less extravagant digs than my T-hangar. Ultimately the Pulsar found a home in Million Air's corporate hangar at Long Beach; the same FBO had taken over the hangar concession where I used to be based, at what was once Martin Aviation. Now this little white airplane nestles under the wings

of King Airs and the occasional Gulfstream bizjet. Such an oddity in a hangar full of high-ticket airplanes, it invariably draws a crowd.

Even subject to the scrutiny of anyone passing through the Million Air hangar, I nonetheless endeavored to find a niggling electrical problem that had become a nuisance. Unfortunately, as I discovered, "better" is very often the mortal enemy of "good enough." In attempting to rid my headphones of an annoying "pop, pop" every time the transponder duly responded to ground interrogations—it does so with such frequency in Los Angeles that you wonder if it doesn't just send back an "enough, already" remark from time to time—I rebuilt the electrics almost from scratch. As I added more features to the airplane—another radio, another instrument—the electrical wiring behind the panel began to resemble the result of a crazed homeowner who constructs

additions without blueprints. Wires hung onto other wires, in different bundles but going the same place, with other conduits too short or too long for the task. What started as a simple electrical system began in short order to display vividly my inability to look much further ahead than the next flight.

No more of that, I concluded. So the new main wiring harnesses, built outside of the airplane so that I wouldn't come home looking like the loser in a multiple-cat fight, have extra wires for future, um, enhancements. And wherever the loom connects to an instrument panel, there's a robust and (I hope) reliable gang connector. Now both instrument panels come off with a few nuts and the twist of two thick connectors.

And the noise? Still there. But by rerouting the transponder antenna coax well away from any radio-signal-carrying cables, I have reduced the intrusion to a mere shoulder tap, rather than a slug on the side of the head. This time I was the one saying, "enough."

In the 35 hours since flight test had concluded—for a whopping 75 hours total time—a year had passed. For experimental/amateur-built airplanes, the regulations call for an annual "condition inspection" roughly equivalent to an annual inspection for production models. As the proud builder and owner of a repairman's certificate—granted for the successful completion of the airplane and nontransferrable—I had full authority to do the inspection. Given how simple the Pulsar is, it's probably not surprising that the inspection required just a couple of days of part-time work. Airframe-wise, I found nothing broken, loose, or in imminent likelihood of departing the airplane.

As for the engine, a Rotax 912, I have equally high praise. In its lifetime, my 912 has burned less than two quarts of automotive oil and consumed an average of about 3.3 gallons of fuel per hour. One item of note for other 912 owners: Be judicious in your use of Alcor's TCP fuel additive. This elixir has long been successful in reducing lead fouling. Because my mild-steel exhaust system had begun to shed its paint, I had it off at the annual for a new coat. Inside the Rotax's exhaust ports were small lead

balls, clearly the result of using 100LL in an engine with no mixture control. Plain to see, the 912 would be happier on unleaded fuel. I duly cleaned the ports and vowed to use TCP at *every* fillup. (Auto fuel is out of the question for me, in large part because toting cans beneath the noses of the fuel-truck drivers would do nothing to cement our relationship. It's also a pain in the neck.)

With all this work, was there any time to fly? As you can see by the total number of hours on the airplane, the answer has to be a "not much." In truth, the Pulsar saw duty in short local hops, when I didn't have to be anywhere at any particular time. I could enjoy the airplane as

the Pulsar is still a light airplane and has relatively little inertia compared to larger, heavier platforms. So while the airplane remains generally quite stable and forgiving, weather conditions that produce ride reports of moderate turbulence from other aircraft often result in an uncomfortably bumpy and busy ride aboard the Pulsar. There is, I have learned, more to handling turbulence than wing loading alone.

But the good news is that I can fly the airplane for an hour and not, in turn, have to work on it for two. It's been amazingly reliable. One incident of note occurred when I forgot to secure a throttle cable to its run and it got caught

by the open-backed crank-mounted alternator rotor. It pulled one cable out from the carburetor ferrule just enough to throw off carb synchronization. I noticed a modest increase in vibration, but the real tip-off was my inability to get the power reduced enough to land. The first attempt resulted in a couple of thousand feet of float before I understood the true complexion of the problem. The next landing was essentially dead stick—the geared 912 *will* stop the prop at approach speed if you turn off the ignition—and not much of a pulse-raiser at that.

Inevitably, I am asked—now that I can bask in the warm glow of a completed, flying airplane—if I would do it again. The simple and

honest answer is yes. Would I do it tomorrow? Well...no, not exactly. I'd want more free time to devote, not the dribs and drabs left over from a busy career and family life. Would I build another composite airplane? Well...maybe, depends upon the airplane. On one hand, working with glass can be tedious and difficult; but on the other, I now have a hard-won education on the topic that it would be a shame never again to put to use. Other construction methods contain shortcomings and difficulties of their own.

I have friends who worry about my beginning another life-changing airplane project—as my Pulsar experience most certainly has been—without extensive and probably psychological consultation. But I allay their fears by pointing out that before I can begin again, I've got to finish this one first. □



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inexpensive—3.3 gph, remember—and low work load aerial entertainment. In the more than 12 months during which the airplane's been flying, I haven't made a single long business trip in it. Hardly is the airplane itself to blame, though; in part, it's because my Pulsar remains a VFR-only beast. While I'm sure many Pulsar builders will fit a vacuum system, gyros, and the appropriate radios, I decided to leave mine simple and unencumbered. As a result, I have to be certain of good weather at each end of the trip and for the duration of my time away from the office. Hard to count on the skies for that.

Moreover, you cast a critical eye on weather conditions when flying an airplane that tips the scales at just 1,060 pounds loaded to maximum gross weight. Even with a moderate wing loading of 13.3 pounds per square foot,