

the fuselage where it could do some serious work. Granted the new nose gear hanging out there would eat up some of the gain but properly faired there could still be 2-3 knots left.

You are undoubtedly thinking, what is my basis for all this new found speed? I raced my Mooney M20E 200 HP at Sun'N Fun 1994 in the Sun 60 Air Race. It's a 60 mile triangular course that ends up back over the runway. I spent a considerable amount of time preparing it for the race. It had a fresh overhaul, I knew my best CG (3 cases of Coke in the baggage compartment) and The Mooney had several speed mods installed. Oddly enough it was the things that I took off the belly that netted me the best speed gains. I got 6 honest knots by removing the ADF bubble, DME blade, marker beacon antenna, belly strobe and 2nd COM antenna. The only thing left was the blade for the transponder. Six knots! When I look at that giant blister on the Defiant it is tantalizing to imagine that there are at least 6 knots ripe for the plucking. After all, on a tractor airplane, the only place the prop blast has a good clean backward shot is on the belly. The smooth airflow is disrupted on every other surface by wing intersections, canopies, etc., etc. Without the blister the rear engine's cooling scoop might also see a little more air and mine could really use it. The rear prop might also bite a little more undisturbed air which would also help the Defiant down the pike.

All in all the modification would make sense even if no speed were gained. I know of at least two Defiant builders who have opted for a Cessna nose gear. I would like some input from anyone who could help me in this area. One of my main concerns is what must be done to assure the new attach points are strong enough for the task.

I would like to enlist the services of some capable individual that has the time and expertise to help me through this project. I would be willing to take my aircraft to another airport to get the work done. My main criteria will be quality work done by someone who has the time to stay with the project and get it done in an expedient manner. When finished I will gladly remove my little "Down & Locked" confirmation light.

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### Twin Fever

It would be interesting if the Flier's members would elaborate on their reasons to choose a twin engine machine. After all, we all know that two engines don't get you twice the speed or twice the load carrying ability. The care and feeding bill is about the only thing that is truly times two with a twin. The safety of the extra engine is of course the correct answer. I would assume that many of you may have other very emotional reasons, which supersede the textbook hoopla. I know I do and I would like to share mine with you.

It was spring of 1996 and a beautiful sunny VFR day. I knew there would be some cumulus formations later in the day but nothing was forecast to be threatening. I departed my home airport at Greenwood Indiana (HFY) in my Mooney M20E at about 9:30 am to pick up an employee at Bloomington, Indiana (BMG). We were to continue from there to Lexington, KY for a business lunch. We departed Bloomington and I climbed to 11,500 feet. I began to dial that old Mooney in for my best cruise configuration. I really enjoyed all the futzing with the mixture, prop, cowl flaps, GPS, etc. I got everything just where I wanted it and began to settle back in my seat for another beautiful flight.

Life was grand.

Then without warning a noise started coming out of my 200 horse Lycoming. It sounded like about 100 of those little ponies had hammers! They wanted out! I knew from the ferocity of the clammer that my powerplant was not long for this world. I immediately pulled it back to idle and pulled the prop back for best glide. Unlike other power failures I knew I could skip the drill of checking mags, fuel, alternate air, carb heat or whatever. This engine was finished and I needed to land... Now! My passenger asked if something was wrong. I thought the truth would be the best answer so I told her I did not like the way the engine was sounding. She seemed okay with that so I didn't elaborate since I had plenty to do in the next few minutes. A quick GPS and chart check told me that there was an airport almost directly below. a few more seconds of landing site qualification told me that this was a short grass strip so I thought I would see what my next option was. It was Madison Municipal and it was only a few miles behind me. I was still at over 10,000 feet so I thought it would be the best choice since it has a paved strip 4400 feet in length. I then proceeded to bank the airplane to the left making a shallow 180 and reassured my passenger that I thought it would be wise to land at Madison to see if there was a problem. I knew the engine was trashed but I also knew there was nothing to be gained by having a hysterical passenger to deal with. My original flight plan gave me about 20 knots of tail wind and I was amazed at how quickly we were NOT getting to Madison Muni with this wind in my windshield. I was still letting the engine idle to save any power that might be on tap for the landing phase. I then realized that I had not declared an emergency. I decided that mayday was not appropriate but it would be wise to



make my radio call to Madison unicom frequency and let them know of my intentions to land there. It seemed an eternity to the airport as my altitude was dropping away.

Madison Indiana is on the river and there are large power plants every so many miles dotted along its length. Each power plant has very tall stacks associated with it. One of these towers was on my powerless approach. I was not fearful of any collision hazard but it was unsettling to see that I was below the top of it as I chugged by. I applied a slight amount of power and entered a low right base to final for runway 03. I settled the plane down for what probably appeared to be a routine landing. I taxied up to the ramp and pulled the mixture and cut the mags. That's when it hit me and I began to worry. I somehow knew that I would never feel totally comfortable sitting behind a single propeller again. This was reinforced by the fact that the very night before I had flown from Meigs Field in Chicago to Greenwood. Had this failure occurred then I might be playing a harp (or tending the fire) rather than writing this article. As for the Mooney, the bottom hold down studs on #3 cylinder had sheared away. That hammering sound was the base of the jug beating against the engine case as the piston moved in and out. I could have lost the whole cylinder if I had continued much longer.

That was it for me. My single engine days were history. I thought I had the most meticulous maintenance program possible on my airplanes. We must realize they are man made machines subject to man made errors. I was lucky.

My thoughts went immediately to a twin engine aircraft. Over the next few months I looked at several Barons, Twin Comanches and 310s. Out of a whim I decided to take a look at Ted Roger's Defiant N23TR. I was instantly mesmerized. It made so much sense. I sold. Now after over 2 years and over 200 hours of great flying, I am still sold.

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## Across my desk as Email

Have some epoxies been found that are better suited for use in making fuel tanks than others? I believe I read about some epoxy flaking off in fuel and causing a Cozy to crash.

All the suppliers claim their "structural resins" are suitable for fuel containment. And, they are - IF - the builder knows how to go about it and does everything correctly. I have always been adamant about "post curing" epoxies, especially the fuel tank. You can't buy cheaper insurance.

Safe-T-Poxy I or now EZ-Poxy 87 is probably by far the best in this category, with or without a post cure. Chemical resistance is one of the prime attributes of epoxies beyond homebuilding airplanes. They are used for building fiberglass chemical storage tanks and piping and for lining of steel tanks to prevent corrosion. In that industry the curing agent "type" governs the degree of chemical resistance. Aromatic amines are by far the best known curing agent type for overall chemical resistance - particularly in fuels, solvents and strong acids. EZ-Poxy 87 is the only aromatic amine curing agent available to the homebuilt world.

Next in line are "aliphatic amines". The original RAES & RAEF were "modified" aliphatic amines. However, according to my tests the RAES without a post cure was absolutely no good for fuel and marginal with. But, the RAEF without a post cure was marginal and did just fine with a post cure. Thus, the original Vari-Eze plans mandated RAEF for the fuel tanks.

Next in line are "cycloaliphatic" amines. Aeropoxy, MGS, Proset, and EZ-Poxy 83 & 84 are "blends of modified aliphatic and cycloaliphatic amine adducts". Modified - because the straight stuff has bad cure behavior. Some modifications work out better than others. A prime example is the Aeropoxy's sensitivity to temperature and

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moisture. I call these "quirky cure characteristics". However, even the "quirkiest" of these curing agents will resist fuel - IF - they are properly applied and fully post cured.

DO NOT simply brush the resin on the inside surface of the already cured fuel tank and expect it to cure like a 2 or 4 ply lay-up. This is where the screen plugging flakes of epoxy come from.

Your original layups for all the inside tank components should be "wet" so to be certain there are no dry spots, pinholes or voids. This is no place to be too concerned about weight. Even the BID tapes in the corners should be nice and wet. Peel ply only where secondary bonds will be needed. For those of you who like the smooth surface of peel plying - add an extra final ply of a fine

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