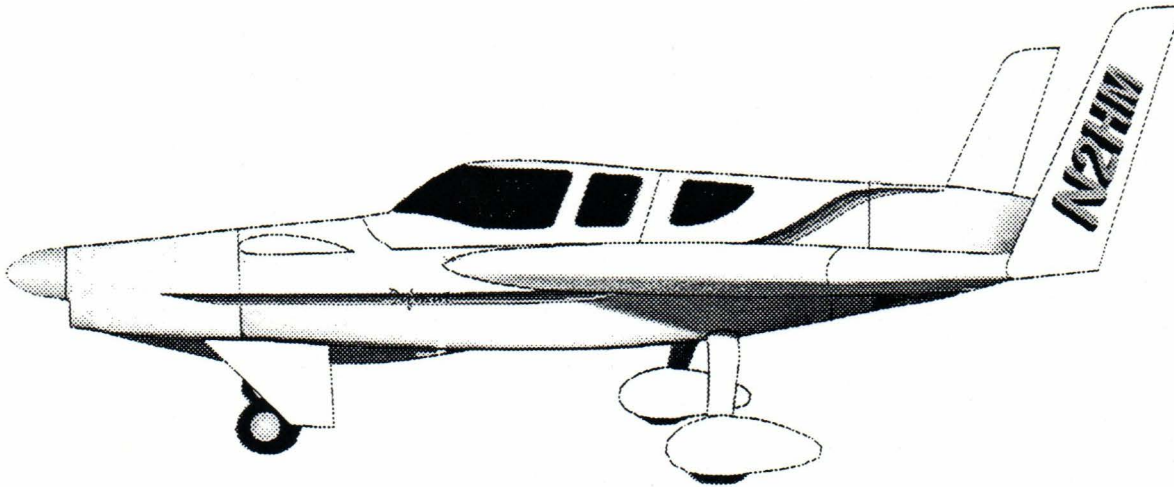




Defiant Flyer Newsletter

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Just for something different

I thought I would put Harry Manvel's proposed paint scheme on the title page.

I made a visit to Michigan in late March to visit Harry's project. Randy Winkel was there also. Harry's project is moving along just fine. It could nicely fly next year, if Harry can keep his priorities screwed up. Harry is basically done with only the endless details to finish.

Jerry Chasteen

After reading the last edition I decided that I would send you some fodder for the Flier.

Two Steps Forward and One Step Back

I first began flying Defiant N23TR in the summer of 1996. About the only thing about it's flying characteristics I found objectionable was the way it eats up runway on takeoff roll. I was used to the little Mooney and Grumman AA5-A getting off in seemingly short order. One of the obvious reasons is the slight downward angle of attack it has on the ground because the Mooney nose gear is too short. I understand that some owners have cut the rear main legs down some to increase the angle of attack of the canard. I

would appreciate any positive feedback from anyone who has done this.

I gave the problem some considerable study at first and I came to some general assumptions. It seems that the rear engine is not only pushing the aircraft forward on takeoff roll but it is also pushing the nosegear down into the runway at the same time. This downward force tends to hold the aircraft on the runway far past the point that it could be flying.

One nice day I decided to try an experiment to see how severe this tendency was. With about 1/3 tanks and me as the only occupant in N23TR, I departed Bloomington Airport, which has a beautiful 6500 foot runway. I began the takeoff roll normally bringing the rear up to full power then the front, then releasing the brakes. I typically need to see about 80 kts before the Defiant breaks the surly bonds of earthbound creatures. With about 4500 feet remaining I reached 65 kts. At this point I gently pulled the power out of the rear engine. At the same time I pulled back on the stick. The nose immediately leaped into the air. I then re-applied full power to the rear powerplant and flew away from the runway as pretty as a picture. This was almost

15 kts sooner than normal.

What happened is that the rear engine let go the downward force on the nose. It then went into negative thrust and acted like a small parachute to help pull the nose off the runway.

What does all this mean? It simply proves a point. Is it a potential short field procedure? Not on your life! I have only tried this procedure a few times and only when I had plenty of runway to balk the takeoff and safely stop the aircraft. Such operations where power is messed with at such a critical time could be deadly. There is the potential for pulling the wrong lever or the possibility that the rear engine might not be there when you re-apply power. Kas Thomas, the editor of the publication TBO Advisor, would also caution that such activity could cause an internal balance weight to be thrown out of tune. He also goes on to suggest that instructors should pull the mixture when simulating an engine out on a twin, not the throttle. When the throttle butterfly is slammed shut it can cause a whole bunch of backpressure trauma that pulling the mixture does not cause.

Well anyway, my experiment was

interesting but I think that more angle of attack is still the best remedy. Unless there is a way to put a small retro rocket in the nose facing down that could be fired at about 65 kts., just kidding!

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A Little Tweakin'

For the past two years I have been doing minor tweaks to N23TR to make it more user friendly. The aircraft already had a gear horn but I still had to look to make sure the gear was locked down. At night this meant battling with a flashlight. I decided to add a landing gear indicator light. It's simply a little pen light bulb focused down on the landing gear pivot arm where the "down and locked" marker if applied. I have a little momentary push button in front of the pilot's side stick. I can reach it with my index finger. It works great and sure beats fumbling around with a flash light on final approach. You would think that I have a gear-up in my past if you saw how many times I activate that little light on final. All the parts are available at Radio Shack for under ten bucks.

Why is it that your main tires always seem to loose a few pounds of air pressure every month or two, and the nose gear never seems to loose any air? The scientific answer is... Murphy's "Lack-of-Access Factor". "Anything that is hard to get at will always need the most maintenance". As you know the whole wheel pant has to be loosened and pulled up to add the necessary air. After several perfectly planned flights starting late due to this I decided to come up with a solution. It's dumb as dirt! I went to the local plumbing supply and bought some chromed 1 1/8" plugs. These are the same units you use to cover the hole in the top of your sink where the sprayer would have been. I then proceeded to cut a hole in the wheel pant to accommodate this plug. In this mod

it's like real estate... Location, Location, Location! I spent a bit of time making sure the hole was in the right place. The plugs work great (less than \$1 each). Sears will sell you a great tire chuck with a built in 8" extension and air gauge all in one for about \$24.00. Now I can air up the mains in just minutes!

I'll admit that I broke one of Murphy's laws during the installation, "Assume Nothing!" (Which is also a prudent rule to follow during all flight operations). I assumed that I could use the corresponding hole saw for the plumbing plug... wrong! The hole was slightly too big and made for a sloppy fit. I had to shim up the plug to make it fit tightly. A better method would be to use an undersized hole saw and then custom fit the hole with a die grinder, dremel or round file. I originally visualized painting the plugs to match the wheel pants but after they were neatly plugged in their haies they actually look quite functional in chrome. I have flown this mod now over 100 hours and there has been no evidence of the plugs wanting to part company with the aircraft. This mod is a good candidate for any plane with wheel pants. By the way, the original Murphy's Law that started this project still applies. Now that I have easy access to the mains they seem to have stopped leaking air.

My aircraft has the original style canopy that swings up to the right and away from the occupants. It was very awkward to close it when I was outside the aircraft. I would have to get up on the step in order to reach it. I then had to step down while holding the canopy to lower it. I went through several different ideas including a lawn mower pull rope and handle, very tacky! My wife suggested using a luggage strap, the one you use to pull your suitcase around with. When I saw people in airports using them it always looked like they were taking their luggage for a little doggie walk. I've had the necessary strap

in our closet. I quickly cut the strap to the optimum length and mounted it to one of the screws that hold the canopy safety latch. Now I can easily reach the strap to pull the canopy down to where I can reach it. I also attached a small patch of Velcro that allows it to be neatly secured to the inside of the canopy during flight.

The Perfect Nose Gear

I am not referring to some piece of athletic apparel. I have long dreamed of the perfect nose gear for my Defiant. The old Mooney gear works okay but it's too short and complex. With so much attention to the design, it is surprising that Burt Rutan settled for it in the first place. A taller gear would allow us to use a more certified style prop and increase the angle of attack of the aircraft shortening our takeoff roll. The best solution may be a fixed gear. One similar to the new Cirrus SR20 (but beefier) would probably work well. Or if a fully steering gear is preferred then something like the unit used on the Lancair Columbia 300 might be nice. A fixed nose gear would truly make the Defiant as easy to fly as a Cessna 172. A fixed gear might actually find a few extra knots in speed. Here's how:

Upon close examination of the Defiant head-on (with the gear up) you can immediately see that the gear is not truly retracted. The tire protrudes slightly. Mine has no gear doors and there must be a huge amount of turbulent air caused by this opening. The huge bulge that houses the gear and the carburetor induction box could be eliminated entirely. By using a 90 degree induction elbow, the fuel injection unit could be tucked back under the engine. (This would only work if a Bendix fuel injection unit were used.) This may not seem like a big deal but take a couple of minutes and look at what we would have. With this huge bulge gone the prop blast from the front engine could now go straight back under

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