

DRAGONFLY BUILDERS AND FLYERS NEWSLETTER

THE OFFICIAL VOICE OF DRAGONFLY BUILDERS ALL OVER THE WORLD

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Pat Panzera's MK II-H in its current state.

**Photos and text by
Patrick Panzera**

Since this is the last issue I will produce as editor, I figured it was time to show my project.

I actually started flying when I was 14. Back then (in the mid 70's) I was working at a gliderport in El Mirage, CA. I was one of 3 line-boys, also known as a ramp rat. My first flight ever was while working

at El Mirage. It was in a 1946 Aeronca Champion 7AC (Air Knocker). One of the tow pilots offered to take me for my first ride. Although I had dreamed of this day for most of my life, the experience

turned me off to powered flight. It was noisy, I couldn't see over the panel (I was in the front seat) and I could not get the hang of driving it down the runway. I guess the tow pilot wasn't all that concerned whether or not I enjoyed my first ride in an airplane, as he didn't do anything to ensure I had a good time. (I've flown over 100 Young Eagles to date, and I made sure that every kid I took up had an excellent experience.)

The ride itself was worse than the taxi. The pilot was not smooth, and every attitude change brought about motion sickness, which was heightened by the noise, smell and vibrations.

Although I continued to work at the gliderport, I still dreamed of flying and I loved all forms of aircraft. I didn't fly again for close to 2 years, when one of the glider instructors talked me into a glider ride. I was certainly apprehensive, but I wanted to see if gliders were as bad as powered craft.

My first glider ride was in a Switzer 2-33, a 2 place, tandem (instructor sitting in back), high wing strut braced trainer, with an all metal wing, tube and fabric fuselage, single landing gear with nose skid and tail wheel. Although the take off and tow was reminiscent of the Air Knocker, the visibility was much better, the noise level was dramatically reduced, and once we popped off tow, and slowed from 70 to 55, the experience became more like what I had been dreaming of most of my life. The only troubling thing was feeling the instructor's control inputs on takeoff, tow and landing. It was like he was churning butter. The stick was all over the place! Once I took the controls, I didn't feel the need for the stick to be

moved like that, so I assumed that take off, tow and landing were very tricky, something I would definitely never be able to master. I didn't fly again for some time after that.

Winter soaring is not as great as summer, so once the weather turned cold, the flight line crew would drop to one tow pilot, one instructor and one lineboy. The other two lineboys went off to college, so I was left to work the weekends by myself. I got to know another glider instructor (Rick) who sorta took me under his wing, and taught me more than just soaring. My first ride with him was a totally different experience than my previous "ride". I actually began to enjoy flying and started taking structured lessons from Rick.

As an employee, I was entitled to 40% off the price of the tow; if I used a glider which was owned by the corporation (as opposed to being leased), I could use it for free, and if I could find a willing instructor, instruction was free also. Back then, I was making \$1.25 per hour, and a 3000' tow was \$15.00. My cost was \$9.00, which was a lot of money for me, so I didn't fly too often. Additionally, in order to take advantage of my benefits, I had to fly when no one else wanted to fly, which usually meant really bad soaring conditions, including very high winds.

3.25 hours and 21 landings later, I was soloed, and hooked. Almost every weekend I would manage to get in a flight, and some week days, I'd skip school to go flying. A few hours later, my instructor went up with me again, and signed me off to the fly the Switzer 1-26, a single seat, mid wing, all metal "sports car". If the 2-33 was a VW bus, the 1-26 would be a Karmann Ghia.

UNITED STATES OF AMERICA DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION					CERTIFICATE NO. ZZ- 19332	
STUDENT PILOT CERTIFICATE						
THIS CERTIFIES THAT (Full name and address)						
PATRICK (NMN) PANZERA 15608 CONDOR ROAD VICTORVILLE, CA.						ZIP CODE 92392
BIRTH DATE	HEIGHT	WEIGHT	HAIR	EYES	SEX	
9-26-59	68 IN	125	BLACK	BRN	M	
Has met the standards prescribed in Part 61 of the Federal Aviation Regulations for a Student Pilot Certificate.						
1. PASSENGER CARRYING IS PROHIBITED.						
LIMITATIONS	GLIDER ONLY					
	ISSUANCE DATE			EXPIRATION DATE		
	4-30-76			4-30-78		
ISSUED BY	SIGNATURE OF EXAMINER OR INSPECTOR				EXAM. DESIG. NO. OR INSPECTOR'S REG. NO.	
	<i>Gus Briegleb</i> WM. G. BRIEGLER				WE-8-08	
DATE EXAMINER'S DESIGNATION EXPIRES:						
1-31-77						
STUDENT PILOT'S SIGNATURE						
<i>Patrick Panzera</i>						
FAA Form 8420-1 (3-68) Formerly FAA Form 340						

In 1976, I received my glider student certificate, and the next day I soloed. Gus Briegleb, the Godfather of soaring in America and designer of the first lifting wing aircraft (commissioned by NASA, as a precursor to the space shuttle), was the person to issue it to me.

Bear in mind, however, most of the ships I worked around all day were Ferrari and Mazerati caliber. The

little Ghia didn't stand a chance, but for my first "sports car" it was just fine. I remember that first flight like it was yesterday. Rick told me to take a 3000' tow, do some stalls, practice slow flight, and come back down, as the ship was on the schedule for a customer. Well... the weather was pretty darn nice that day. At about 1500' AGL, I was in some pretty good lift, so I decided to save some money and pop off, and thermal up to 3000', where I'd do my air work. By the time 3000' (5760' ASL) appeared on my altimeter, the lift was even better. I hated the idea of stopping in such good lift, so I figured a few more turns in this thermal wouldn't hurt anything.

As I was rounding 10,000' ASL, I looked down at the flight line and noticed a tow plane departing without a glider behind it. 2-3 more turns in the thermal, and I was buzzed by my boss in the spankin' new Bellanca Scout he was using to tow with that day. I got the message.

As I completed the turn I was in, to head back toward the airport, I pulled full spoilers and hit top rudder to the stop, and slipped her all the way down. I was down before my boss touched down, aced the landing, and my instructor didn't know whether to congratulate me or chew me out for keeping the customer waiting... I think he did a little of each

As a ramp rat, my chores were varied. The morning usually started with taking all the trash cans to the airport dump, and ended with tying down all the planes. But during the day, when all the gliders were up, I was sometimes asked to work with the staff mechanic. His name was Chuck Laird, who's family formed Laird Airplane Company and Swal-

low Airplane Manufacturing. In the 20's and early 30's. Chuck taught me how to do fiberglass work and how to spray paint. Most of the people I worked around (lineboys, instructors and tow pilots) were versed in fiberglass work, and many went on to work for a wild eyed man with bushy sideburns, in a small fiberglass

shop in nearby Mojave CA. Although going on to work in Mojave was probably my true destiny, I chose a different path; I joined the US Navy.

In 1977, at the ripe old age of 17, I enlisted in the Navy, and went to boot camp and "A School" in San Diego. Although I tested high enough qualify for every trade in the Navy (which didn't require typing) and although I really wanted a career in aviation, I didn't choose to enter any of the aviation related fields. Rather I went on to Patternmaker school, and became a high end woodworker. Pass-fail was separated by .016" (1/64")

My first and only duty station in my short 3 year career was on board the USS San Onofre. At the time, it was the only co-ed vessel in the entire fleet. It was on the "love boat" (as it was sometimes called) where I met my lovely wife, Veronica, who was stationed there about a year after I arrived. We married in Feb 1980, and she gave birth to our only son Antonio. 2 years later, along came our only daughter, Angela.



This photo was shot from the cockpit of an SGS 2-33, while in "low tow" behind one of the 3 war surplus Fairchild PT-23 tow planes we had in service.

But before any of that happily ever after stuff, I was young and single, living in San Diego, and still dreaming of flight. At the time, I was not interested in powered flight, so the Navy flying club was not an option. I found a gliderport in the area, and went there to start taking lessons again. Well... this time, I was not getting that 40% discount, nor the free rental, nor the free instruction. If I used what little expendable income I had available to me as an E-3, living on the economy in San Diego, I MIGHT be able to take one glider lesson a month. This would not work. So I found myself taking hang gliding lessons. This was great! This was the flying I had been looking for! Soaring in the Switzer 1-26 had started to get a little bit dull, but hanging from the underside of a delta wing kite, (remember, this is 1977) while soaring down the mountain slope was awesome! But there was a catch. I was still training, and not quite ready for the cliffs at La Jolla overlooking Black's beach, so our training ground was a nice little grassy slope, that descended at about the same angle as the kite, so that at no

time during one's 20 second flight was anyone over 10' from the ground. This meant that once you were at the bottom of the hill, you had to drag the kite back up. This got old REAL quick.

At about this same time I started dating Veronica, and all of a sudden any and all traces of "expendable income" seemed to vaporize.

In 1980, my wife and I both received honorable discharges and moved back to my home of record (Victorville, CA), where I put my woodworking skills to practice, and opened a custom millwork business. All the time still dreaming the dream. Around 1983, I discovered ultralights and took my first "lesson". But with raising kids and the other bills associated with being a productive part of society, I could not justify the expense of any sort of flying, so all dreaming was put on hold.

In 1988, we packed up and headed for Hanford CA, where we've been ever since. After a few short tours as a construction superintendent, cabinet design software salesman, and building inspector, I settled down and opened the drafting business. We still run today, where my son and I draw house plans all day, my wife Veronica keeps the bills in order, and my daughter Angela is my personal assistant, who's chores include all the record keeping and shipping of CONTACT! and DBFN.

So what's all this have to do with a Dragonfly??? I'm getting there.

In 1996 the flying bug hit me hard. I decided it was time to complete my glider rating, and working my way to my long time aspiration of becoming a CFI-G. The time was right. The business was prospering,

the kids were doing well, Veronica was on the Grand Jury, it was time.

There is a glider club in the foothills not too far from where I live, so I took a drive and paid them a visit. The people at the flying club were very receptive. I was there maybe 10 minutes before I found myself strapped in the front seat of a 233. It seemed all too familiar. After close to 2 decades since I had been in a glider, I was still able to do the take-off, tow, and landing. It was great! We then went into the office and started running numbers. Between the buy-in, monthly dues, aircraft rental, instructor and tow, the hourly price was substantially more expensive than power training. I declined to join the club just then, and headed for the local FBO to see what it would cost to get my power rating. I figured that I'd get the license, and have the glider rating added on.

At the FBO I met with the person who would become my flight instructor. After taking an introductory flight, and running all the numbers, I decided to go for it. My instructor then told me that if I were serious, he'd like to fly with me 2 times a week. I laughed and said there was no way I could afford that. Well... somehow I found the money, as 6 months later, I had my license.

While flying power, I realized something that never occurred to me when I was soaring. With an engine up front, I could actually go places! Now don't get me wrong, with soaring one can certainly attempt any length of cross country flight, but the operative word here is attempt. Properly planned and executed, long cross counties are common, but with power, I could get to where I wanted to go, and not only assure my arri-

val, but I could arrive at a certain time. This changed a lot of things for me. No longer was aviation just a thing of pleasure for me, it was also a tool. I can justify tools WAY more than I can justify toys, so I decided to go all the way to CFI, and then add on the -G.

Ok, here's the payoff. I wrote all the proceeding to get to this point. Now that I had my license, I needed to build time. I surmised that the only way I could afford to build the required minimums for an instrument, commercial and CFI ratings, I would need my own plane; rentals would not cut it any more, so I started shopping. I quickly saw that airplanes were expensive to buy, and I knew I possessed the skills to build a plane, so I started looking into experimentals.

I sat down and made a criteria list. The 2 most important things to me were that I could build from plans and the plane could use an automobile engine. Other items of importance to me were that the plane be made from wood or fiberglass (remember I have extensive experience with each), that it be a 2 place (I'd like to bring my wife or kids), that the seating be side-by-side (to visit with my passenger), and that it goes pretty darn fast (it had to be an efficient "tool"). The "coolness factor" was just a bonus. I started reading everything I could get my hands on. I had already been a subscriber to KITPLANES, and noticed a small ad in the classifieds section, with a tiny photo of a Dragonfly. I was hooked! I showed the photo to my wife and told her that this was the plane I was going to build. She just rolled her eyes.

I went to the local FBO and asked around if anyone knew where I might find a Dragonfly to look at.

I was told that there was a beautiful DF in the nearby city of Visalia, so I headed to the Visalia FBO and asked around. There I was told that in addition to the one I was sent to look at, there was a Dragonfly project for sale by a local Visalia man who decided to not finish the plane, after several close friends of his died in a plane crash, which could have easily been avoided. (After a camping trip, they departed a high altitude airport at the hottest part of the day.) I made contact with this gentleman, and made him an offer for the complete plane.

It turns out that the gent I purchased the plane from had a background in woodworking similar to mine, had been in construction, and was currently a building inspector. We had just too much in common. The craftsmanship shown in his work is impeccable. In my opinion, I could not have done any better, and actually the plane was built as if I had built it myself.

I was (and still am) very pleased with the purchase. All the major lay-ups were completed, and the plane had been fully rigged, including all controls. The only major items left were landing gear (the plane was built as a MKI, but didn't have the wheel pants installed, but the project came with a full set of MKII parts), canopy, cowl, engine, instruments, electrical, paint and upholstery. There was not a speck of micro anywhere (the weave was bare) so I had a bit of filling still to do. Some say that the plane at this stage is at 75% with 75% to go.

Right off the bat I set the plane up in my driveway and began to check the rigging. The plane was built in 1983-1984, back before digital levels were common. The plane still had all the bondo blocks in place,

so it was easy to check everything. Each measurement I took was dead on. The worst of it was that the sweep of the wing was off 3/16". I can certainly live with that.

With the plane rigged, I took a few photos, and brought them with me to the '97 Ottawa

Field of Dreams. I showed the photos to Spuds, and asked his opinion. I was not sure if I should static load the wings to check them, since I didn't build them. After looking over the photos and agreeing that this is one fine piece of work, Spuds said, "Have you run across anything done [on this plane] by this builder that would lead you to suspect that he didn't do a perfect job inside those wings?" My immediate answer was no, so he said that I had my answer.



The cockpit of my plane as I picked it up from the original builder. This is one of the photos I took with me to the 1997 Ottawa Field of Dreams.

Before I went to Ottawa, I found the internet e-mail group. There I met Dave Morris, Don Stewart, Gene Arthur, Nate Rambo and a few others that I also got to meet at Ottawa. I was fortunate enough to get a ride in Mark Snow's DF. After that ride I KNEW I made the right decision, and I knew that the Dragonfly met my full expectations.

Once I got home from the fly-in, I was pumped! No sooner did I get



This is another photo of the plane before I started working on it.



One of the first things I worked on was the canopy, and filling the weave of the starboard side fuselage. I have very little space to work in my garage, so only one side can be worked on at a time.



This not only shows the vertical stabilizer faring, but also the notched trowel method of applying micro. The white spots are where the surface was low.

home from the fly-in, I started working on the plane, and made the canopy. I had seen enough at Ottawa that I knew I wanted it to hinge forward. So rather than use the already built canopy bulkhead, I made my own hoop from 1/4" Baltic birch, and fully encased it in glass. I also started filling the weave of the fuselage. On the internet e-mail list, someone mentioned the technique of using a notched trowel for applying micro. I had already tried some weave filling using the more traditional rubber squeegee technique and was not too thrilled with the results. But the notched trowel method made short work of the process.

While at Ottawa, I got to look over a lot of different planes very closely. One thing I noticed was that not many people had faired in their vertical stabilizer. Some had extended a bit of a dorsal, but not much full faring. I wanted to do something a little different, so once I

completed the canopy and was bored with filling weave, I added a slight dorsal and faired everything in. Another thing that was a hot topic at the time was tail wheel springs and their propensity for failure. So I added some carbon uni to the bottom of the stinger, and carried it forward to the fuselage where I flared them out. Now my spring is quite stiff. I also liked the way Bruce Dixon had installed his rear facing position light, so I copied him and faired mine in, between the stinger and the rudder.



You can see that with the lower attach point properly aligned, the upper attach isn't even close.

Like I said before, I was getting bored with filling weave, so another chore I decided to tackle was hanging the engine. The plane came with a new 1835 HAPI, and the appropriate "old style" mount. I got out my plans and read the section on installing the mount to the airframe. Well... the engine mount didn't even come close to fitting the little aluminum angles protruding from the firewall. Based on all the other work on this plane, it was easy to tell where the mistake was. The mount. So I figured that this would be a great time to switch to the "new style" mount, and called the only possible vendor at the time, Great Plains. I was told in no uncertain terms that HAPI engine mounts were low on their priority list and that I'd have to wait until they "got around to it". So with no experience whatsoever, I bought some tubing, cut up my HAPI mount, and jiggled back together as a "new style". I then took it over to the local welder, who proceeded to ruin all my work

A Corvair for the Dragonfly

Photos and text by Patrick Panzera

General Motors built 1.7 million Corvair engines in the 1960s, and the air-cooled, flat six cylinder engine has been powering experimental aircraft since then. Here's one man's story of his reintroduction to Corvair engines.

I was never too excited about the idea of flying behind a VW engine. Although it seems to fit some home-builders' needs, I really wanted something that had more power and better reliability than a VW, which cost less than a certificated aircraft engine. Luckily, I was reintroduced to the Corvair engine a little more than five years ago when my son's best friend came to our house with a resurrected Corvair automobile.

I was already familiar with Corvairs; my parents had three new Corvairs when I was a small child. But this was the first time I had the chance to look one over closely since I started building my Dragonfly, which was in my garage with its zero-time (almost 20-year-old) HAPI engine freshly hung from its firewall.

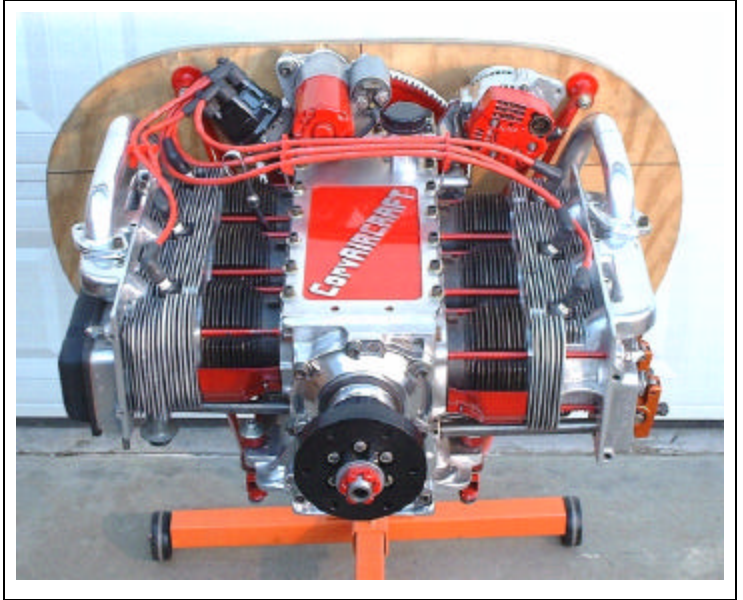
Although I had hung the VW engine, I knew it was going to be temporary. In fact, I had only months before purchased a Mazda RX-7 automobile to drive around to become familiar with the 13B engine, as I thought it would be a viable engine for my Dragonfly. After looking at the Corvair engine purring in my driveway and watching my son's friend literally burn rubber up and down the street, I took a tape measure to his engine. I then measured my HAPI. Immediately I removed the HAPI engine from my Dragonfly and began researching the use of the Corvair engine for experimental aviation use.

Using the Internet, I looked for Corvair information and didn't find very much. There was a bit of information on the Pietenpol website, and a few other websites, but not too much more, with the exception of William Wynne's website,

www.flycorvair.com.

I contacted Dave Morris, fellow DF builder, and told him about my engine discovery. We agreed to divide and concur the research chore. Dave joined the CORSA e-mail list (CORSA is a national Corvair car club) and I joined the Pietenpol e-mail list. Bernie Pietenpol was probably the first experimental aircraft builder to run a Corvair engine. He did so in the 60's, when you could buy a new engine from the dealer for under a grand. Once he put one on his plane, he never built another Piet without this engine. Dave and I both ordered William Wynne's engine conversion manual. Dave got the last manual produced in 1999. I had to wait for mine, as William was re-writing the manual for 2000.

But I couldn't wait, and jumped ahead and started looking for an engine. I knew that the Corvair was big in the Pietenpol community, so I searched the net and found a classified ad section on a Pietenpol builders website. There, I found an ad for a fully converted and freshly rebuilt Corvair engine, which was built for an airboat. It was being offered for



\$500 and included a Heggy propeller. The owner lived in New Mexico, and we arranged to meet in Tucson, at the last Tandem Wing gathering to be held there, before Don Stewart moved it to Laughlin.

I SHOULD have asked some questions. You know the old saying, "If it sounds too good to be true, it probably is". I had envisioned a perfectly executed conversion, with everything painted and clean, ready to run. What I got was a boat anchor. By no means was the engine misrepresented. After meeting the man, and seeing the engine, I realized that my expectations were just wrong, and a deal is a deal, so I bought the engine.

To add insult to injury, shortly after bringing my new \$500 hunk of rust home, I received William's manual. One chapter describes the various engine models which are acceptable for the conversion. Although 1.7 million of these engines were manufactured, there were several different head chamber designs (different HP and compression ratio) and 2 different displacements. I had the smaller 145 cubic inch engine, and William recommends the bigger 164" engine.



This shot of the prop hub is one small example of the poor quality of the “converted” engine I got for \$500. Let the buyer beware.

When I was younger, I spent some time in the US Navy. I was trained as a Patternmaker, and as such, I was intimately familiar with foundry practices, and know what good castings look like. The Corvair engine has some of the ugliest castings I’ve ever seen outside of high school. So I started cleaning them up.

engine installed in a Dragonfly or Q. One builder had started the conversion for his DF, but his project had shortly afterward been put on hold.

One major issue to overcome was that William had developed and was marketing a starter and alternator package for the Corvair, but it was mounted on the front of the engine. The Dragonfly’s cowl is very low in front, and installing those parts there would have meant a large bump in the otherwise smooth-flowing lines of the Dragonfly’s cowl. Not something I was interested in. Additionally, with the Corvair’s extra weight (over the VW’s), I needed to keep the engine’s center of gravity (CG) as far aft as possible. The solution was to develop a rear-mounted starter and alternator. Bear in mind, although I was working on a Q firewall forward package, I was keeping in mind the DF and its particular needs, most of which were identical to the Q’s needs.

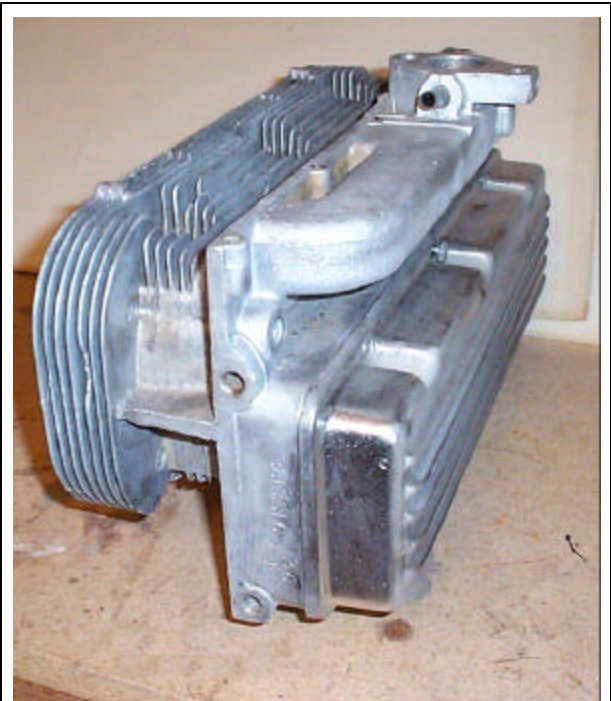
So not only was my engine not suitable for aviation, it wasn’t even a good candidate as a core engine from which to start.

Here in my home town, we have quite the Corvair guru. A trip to his house, and \$200 later, I had the perfect core engine from which to start building my conversion.

I know myself all too well, and know that I’ve built just about everything twice, as I was usually not happy with the way the first one turned out. So I decided that I would not “ruin” the beauty I just bought, and I’d make all my mistakes on the boat anchor. But then came the twist. A very good friend of mine called me and told me of an ad in Sport Aviation where a Q-2 project (with the LS-1 canard and turbo Revmaster engine) was advertised fCHEAP. He wanted to buy it (and finish it) but didn’t have the funds. So I offered him a partnership in it. I also told him that I have an engine for it, the boat anchor (I wanted to save my good engine for my DF), so I started building the little 145 cubic inch engine for the Q.

Well... one thing led to another. I started with some simple grinding with a 4” disk grinder. That cleaned up the castings, but left huge scratches. So I took sand paper to the scratches, but that left the surface dull, compared to the un-sanded parts. So I took a stainless steel wire wheel to the sanding marks, and that just polished the scratches. Eventually I broke out the buffer and ended up with a mirror finish on many surfaces. In addition to all this grinding and sanding, I knew that I would pay a penalty for adding 40 extra pounds to the front of these planes (the Corvair is easily 40 pounds more than most VW conversion) so I set out to save weight.

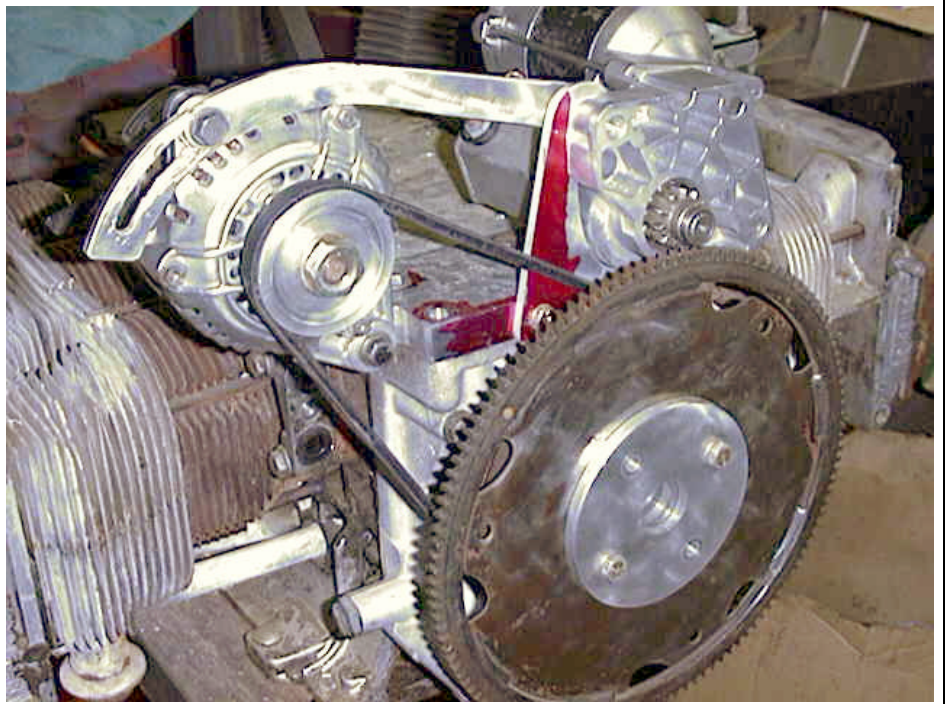
But I was still a long way from having a firewall-forward engine package. There had never before been a converted Corvair



This head casting would be considered very good for a Corvair. By my standards it was quite rough.

Again, the Internet came to the rescue. I had begun some conversations about the Corvair engine on a few different e-mail lists, including the VW, Dragonfly, and Pietenpol lists. Several people became interested in what I was doing with the engine, and Glen Shearer (Vision and Corvair builder) stepped up and offered to develop a Corvair engine e-mail list. Fellow Corvair engine builder Joe Harrison coined the phrase CorvAIRCRAFT, so the list took on that name. Interested persons can join the CorvAIRCRAFT e-mail list by visiting www.CorvAIRCRAFT.com

Once the e-mail list was established, I shared my desire for a rear-mounted starter and alternator. Probably not a week later, Jon Crawford, a fellow Dragonfly and Corvair engine builder, developed what I feel is the first of no less than six different arrangements. Once I saw Jon's work, I began to develop my own. My first attempt was more than adequate; however, once I was deep into building this system, I hit



Jon Crawford's rear starter and alternator arrangement, perhaps the first such setup to be developed.

upon another idea that actually streamlined the parts even more, and allowed me to run the alternator off the stock harmonic balancer, as opposed to machining an additional pulley. The harmonic balancer is a

necessary piece retained from the car engine application, but other than dampening tensional vibrations, it serves no other purpose. The fact that it could drive a belt went unused until I adapted my alternator bracket to align the alternator's pulley with the balancer.

The alternator is from a Chevy Sprint, and the starter/ring gear is from a Ford Probe 2.2L engine. All three parts are available from any local auto parts retailer. The "puck," which adapts the ring gear to the stock harmonic balancer, is another homemade item, as are the top plate with the CorvAIRCRAFT logo and the custom aluminum alternator pulley, but they're not required to get a Corvair engine converted for aircraft use.

The stock Corvair head is a cast aluminum unit, which has an integral intake manifold (log) cast all as one piece. The log has a carburetor base cast with it, and it sits very high. It's too high, in fact, to keep the intake



Following Jon's lead, I developed my own low profile version of his design.



Using a plywood fixture and a 3hp, 1/2" shank router with a 1" diameter straight flute carbide bit, I was able to mill the carburetor mounting boss off the top of the stock cast intake log, to keep the intake runners profile very low.

The ignition system calls for a single set of spark plugs and wires, but dual points in the otherwise stock distributor, with coils, which will be switched between as needed. Essentially, I'll always have a coil and a set of points in reserve. This is a proven system, and is built per Wynne's manual. I'm using the same dual points plate and distributor designed, tested, and offered by William.

stock stamped steel valve covers when the mounting hardware is considered, which is not needed with these covers.

Although the stock Corvair engine came with an oil cooler and spin-on oil filter, the location of the starter and alternator necessitates the remote location of these items. William Wynne has already proven this system on his Pietenpol, and he probably had 200 to 300 hours on the remote systems that I've copied.

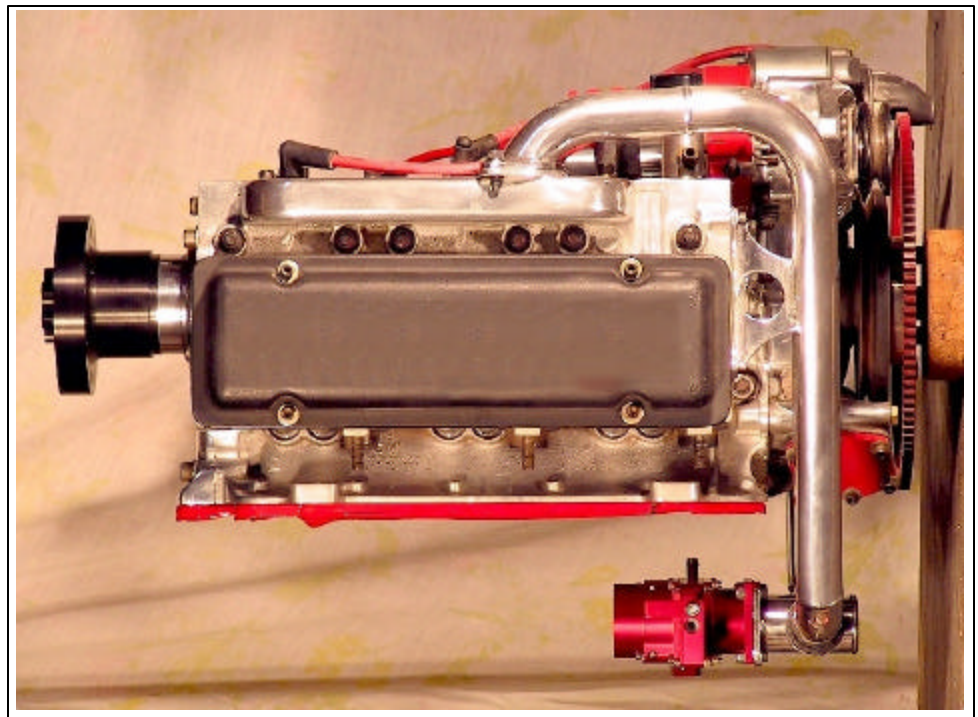
The completed engine, as shown in these photographs, with an oil cooler, but no fluids, prop, or mount, weighs in at 214 pounds. Once I finish the exhaust and add in the other firewall-forward parts, I estimate the total weight should not be more than 245 pounds.

runners inside the cowl on the Q-or the Dragonfly. Again, my cowl fits snugly to the top of the engine, so there's no way I could leave the manifold stock. Therefore I milled the top of the log flat (removing the carburetor base) and welded in its place a very low profile flange. A matching flange was welded to mandrel-bent 6061 aluminum tubing sections, which then make up the entire intake runner system. At the bottom of the engine, where the intake runners meet, there's a flange that was designed for a Stromberg updraft carburetor, but I've since changed my mind and am going with the Aero Carb, until I can afford an Ellison.

In many of the photos of my engine, the valve train was left exposed on one side to showcase the custom roller rockers, chromoly springs and titanium valve retainers, which I purchased from SC Performance. The other side of the engine has a custom cast aluminum valve cover over the valve train. Surprisingly, they do not weigh more than the

Performance from this engine should be in the 100-110 horsepower range at 2800-3400 rpm. General Motors made several engines during the Corvair's nine-year run, from a normally aspirated 90 horsepower, 140 cubic-inch unit, up

Another trick item I've installed is a set of billet aluminum pushrod tubes, designed by me but developed by Dragonfly owner Charlie Johnson (AKA on the internet as OneSkyDog). They are substantially lighter than the stock steel tubes, and they are true. Most stock tubes have been mangled up by mechanics not knowing the proper way to remove them.



to the 180 hp, 164-cubic inch, turbo-charged engine. The particular engine core I chose to build from has a small track record in aviation, and some of the modifications I've made make the performance outcome uncertain. However, had I built the engine exactly as outlined in William's conversion manual, which is well proven in a multitude of applications, I could expect that the 164-cubic-inch (2700 cc), six cylinder, horizontally opposed, air-cooled engine would produce 100 hp at 3200 rpm, and 90 hp (continuous) at 3000 rpm. On 93-octane auto fuel, William saw 5.6 gph at 75% power in his Pietenpol. Peak torque is 160 foot-pounds at 2800 rpm.

Unlike some automobile engine conversions, there's not much to change out of the Corvair engine to get more strength. The prop is driven off the flywheel end, and no modification has to be made to the case. Some light machining needs to be done to the crank to assist in the retention of the crankshaft gear should it ever lose its 25,000-foot-pound factory fit. The crank and connecting rods are forged from the factory, but the cast pistons need to be replaced with forged units.

All engine parts are available new or remanufactured from several reputable mail-order houses. I've replaced everything in my engine, including but not limited to valves, valve guides, hydraulic lifters, cam, cam gear, oil pump, pushrod tubes, rings and pistons, bearings, gaskets, rocker arms, etc., with new parts. I purchased rebuilt connecting rods and .040 over cylin-

ders, along with everything else you could imagine, including a rebuilt distributor, all for about \$1,400.00

The case, head castings, crank, pan and cooling tin were about the only parts I didn't replace. The crank was magnafluxed and polished by a local machine shop, and returned to service

within factory new specifications. I opted for slightly oversized main

ameter propeller, so the 3400-rpm engine speed will work fine with this diameter prop. This is about the same engine speed as the car requires to maintain freeway speeds.

For those who need more power, SC Performance produces a "big bore" kit along with the necessary machine work to the case and heads. His kit adapts VW cylinders and pistons to the otherwise stock engine, which increases the displacement well over 3100

cc. SC produced versions of this engine for sand dragsters, and he can get a reliable 500 hp from the engine, for short bursts.

I'll check back in later with a progress report.

Patrick Panzera



An engine mount of my design, mounted to the firewall of the Dragonfly I bought from Don Stewart, which was built by the late Rob Roe.



bearings to return the clearances to their tightest limits.

The engine is not over-revved like some conversions that use a PRSU. This engine works great in a direct-drive configuration; even at 2800 rpm, the stock engine makes 84 hp at 160 pounds of torque. My application calls for a 54 to 60-inch di-



Here's an example of one of the joints on my first attempt to make an engine mount, prior to the welder ruining it.

2" ahead of where it once resided, and with the 2" piece I removed from in front of the stick, I was able to put it behind the stick, filling the void left by moving the stick forward. It was a very simple operation all in all. I did this to both of the dual side sticks, as I plan to fly from the right seat when I give rides or lessons (once I become a CFD).

While doing the hangar flying, I determined that the center spoke of the

About the only other modification I made to the airframe was to remove the small header tank, in order to install a new full span tank, Nate Rambo style. The only difference is that I'll make the full span tank from fiberglass and not aluminum.

This brings us up to the point where I quit working on my plane. In the following article I go in to more detail, but suffice it to say I got sidetracked with R&D on a Corvair engine for this plane. Oh yeah, then there was the year or so that I didn't work on either my plane nor my engine, as I was stupid enough to offer to help out another Dragonfly builder, and convert his MKI to a

my gobbing up the perfectly crafted joints with molten metal, and trying to hide his crappy workmanship by grinding the welds. Even if this mount is structural, it's just too ugly to go on my plane!

So I bought more tubing, built a better fixture, and took the whole thing to a better welder who tigged it up beautifully. I then hung my engine.

Prior to the engine hanging I did some hangar flying;

I leveled the plane in the cruise flight attitude, climbed in, held the side stick with my left hand, and sat there for an hour, just to check the agronomics. It didn't take long to determine that stick was too far aft for me. So I measured 1.5" in front of the bearing block, and 1.5" behind it, and cut out that section of the armrest. I then measured 2" in front of the forward cut and removed 2" from the arm rest. This allowed me to epoxy and glass the 3" section I removed previously (which still held the bearing block)



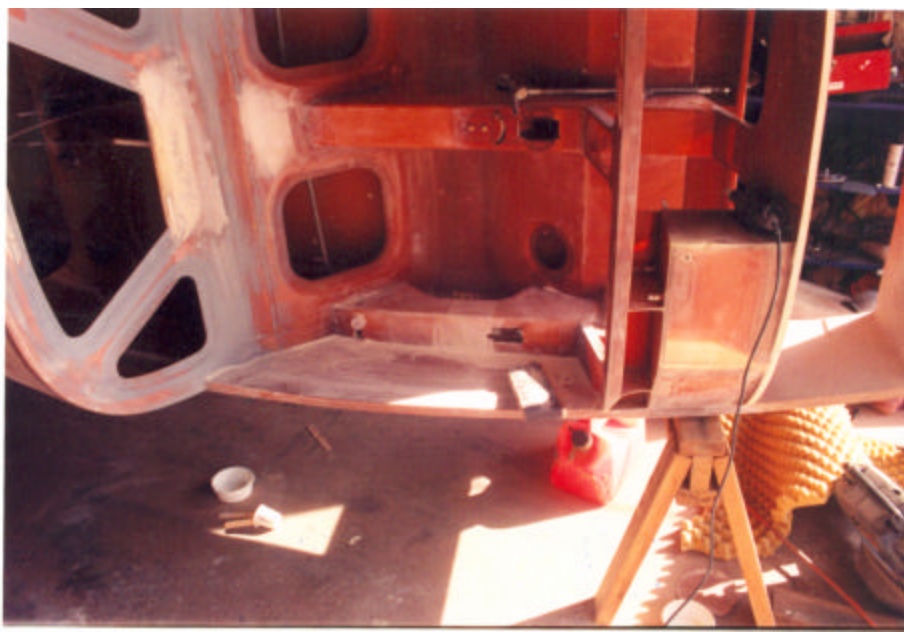
The firewall was modified for the "new style" mount and the HAPI engine was hung when I decided to go Corvair.

upper seat back bulkhead was right where I wanted a hand hold for ingress and egress. So I cut out the spoke, and reinforced (and widened) the area for a good hand hold. This has worked out to be a great modification.

MKII for him, but I won't bother you with the details of that fiasco. After that mess, while working on the engine for my plane, I came across a Q which was further along than my DF, and I came upon a partner for the Q, who could help speed along the process, so I quit working on engines and Dragonflies and started working on this Q. Shortly there after, my partner bailed and moved away. I still wanted to complete the Q, and fly it while finishing



My Dragonfly was pushed to the side when I was working on the Yellow Dragonfly.



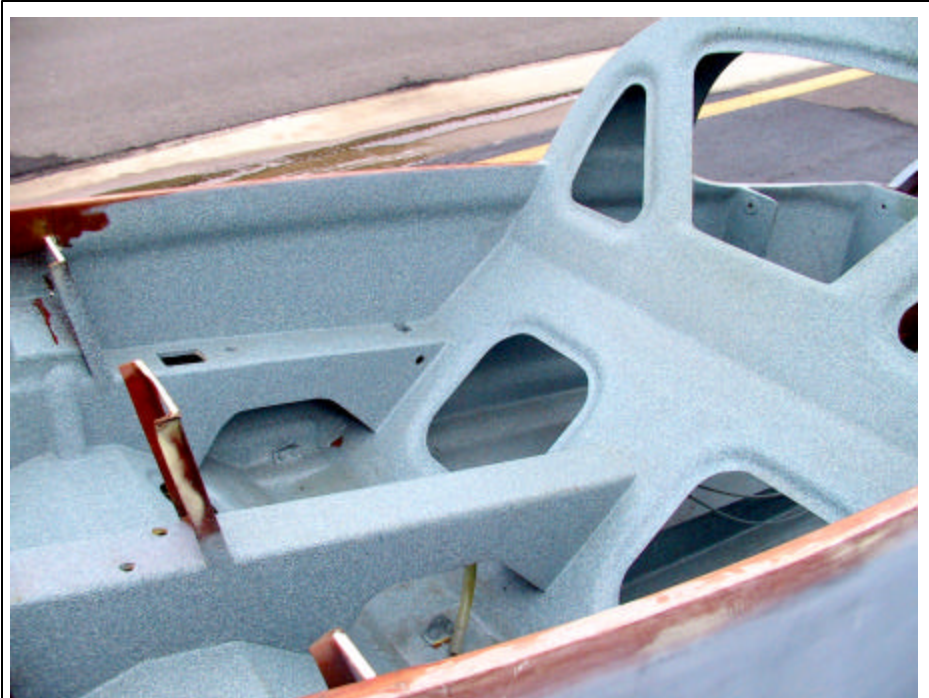
With the airplane on its side, you can see the remnants of the work done to move the side sticks forward. Notice, too, the stock header tank, which has been removed since this photo was shot. A full span header tank will be installed at a later date. Although it'll be built similar to Nate Rambo's design, mine will be built from composites.

Since setting that goal, I still managed to get my instrument rating, I'm currently a written exam and a check ride away from my commercial ticket, I've logged hundreds of hours in high performance, complex, and even have close to 50 hours in turbines. I received a high altitude endorsement, as well as a tail dragger endorsement along the way. So now my original goal of building a cheap plane to build time in is almost pointless. But! Have no fear, I still want my own plane, one in which I can give instruction, especially to those who are about to fly a tandem wing aircraft for the first time. I still want to see the Corvair pull a Dragonfly through the air, I still want to finish my original Dragonfly, and I'm going to finish Rob Roe's Dragonfly very soon.

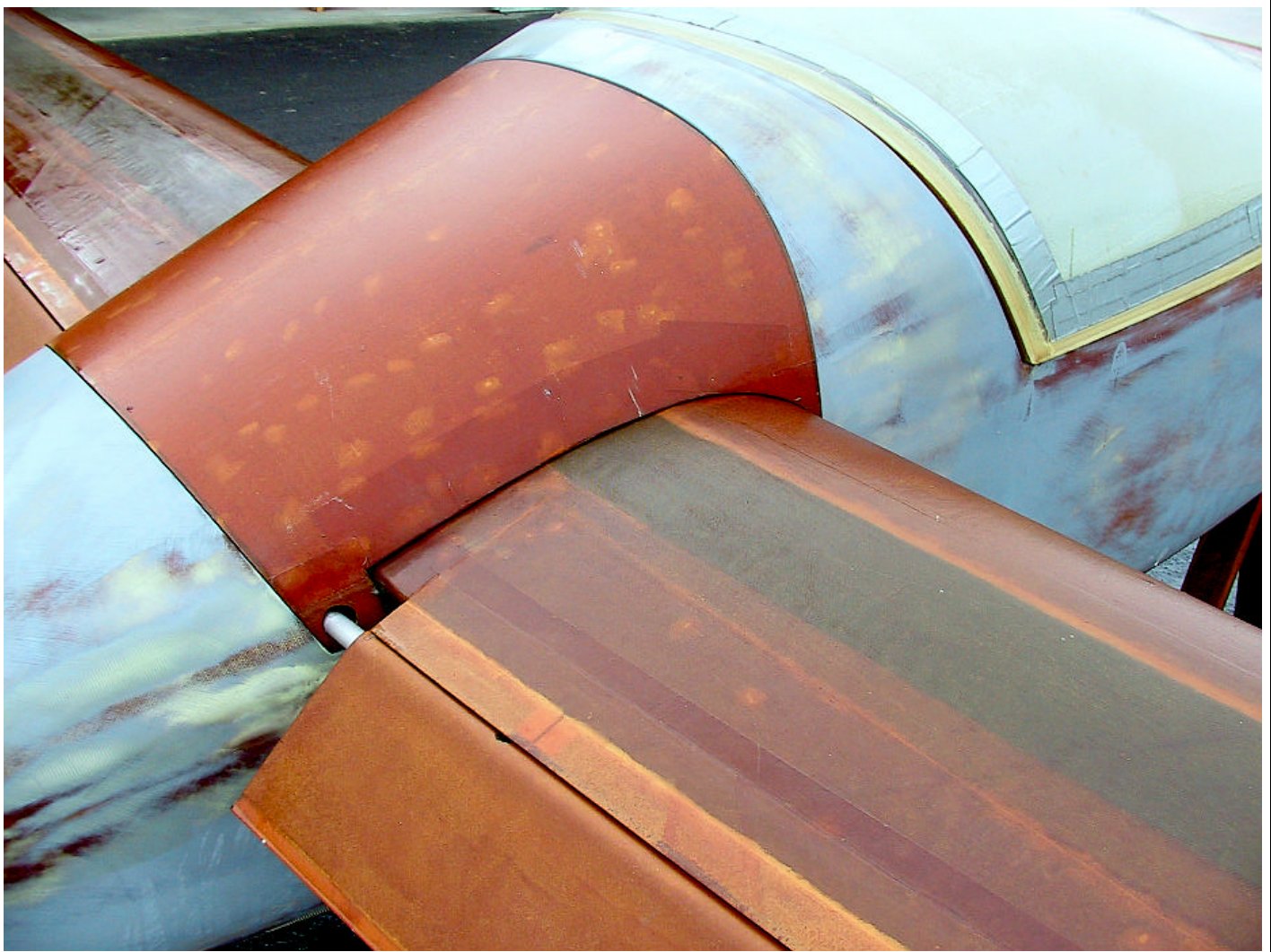
Many of you know that I took over as editor and publisher of CONTACT! Magazine. As editor, I have

my DF, but another even better deal came along. I had the opportunity to buy a flying DF at a very attractive price. I thought I could buy this Dragonfly, fly it while I finished the Q.

So I picked up the DF, as mentioned in DBFN issue #91 and brought it home. Well... although I swore to everyone that I would NOT do this, I decided to sell the Q and put its engine in the newly acquired Dragonfly, and fly IT until I finished my original Dragonfly. Now bear in mind, my goal was not to become the repository of abandoned tandem wing projects, nor was it to become some sort of Corvair aficionado, my intention was to get to a point to where I could be able to afford to build the time necessary to become a CFI and get that darn glider rating, so I could finish where I left off when I was 17. But that goal was set over 500 logged hours ago.



The more completed cockpit area; notice the position of the right side stick, the missing center spoke of the upper seat back bulkhead, and the complete lack of an instrument panel and header tank. I removed the instrument panel with its VFR layout (as seen on page 5 and the photo above), so I could install a full IFR panel made from carbon fiber.



This view allows you to see the quality of the glass work. Even the seam at the turtledeck is tight.



certain responsibilities to attend certain fly-ins. One major responsibility is the Copperstate fly-in, traditionally held the same time as our annual tandem wing fly-in in Kansas (or is it Missouri?) so I won't be flying my DF to that event any time soon. But I do have a very serious goal of flying it to the 2004 Copperstate event, this October, and then in 2005, Laughlin and Livermore. If the dates of the "Ottawa" fly-in don't conflict with Copperstate, I'll do my best to make it. The photo to the left shows the progress made with the engine swap in Rob Roe's Dragonfly. This is the plane I hope to be flying before the end of 2004.

Patrick Panzera

By Jeff LeTemp

Hello fellow Dragonflyers!! I am very pleased to be announced as the next editor of the DBFN, and I pledge to you that I will do my very best to provide you with a technically oriented high quality newsletter. Pat has done a terrific job as the editor - THANK YOU for your service to the Dragonfly community sir!!! I will not go into my life story now (I will have an introduction article in issue 107), but I wanted to ask for your support with the newsletter right up front.

DBFN 106 is a little late getting to you and I really want to get 107 out on time. As I type this message to you, issue 107 is almost ready to go to the printers...but how many copies do I have printed? My goal is for you to have the issue in your hands within 2 weeks after the period covered in the newsletter. So the JAN/FEB 04 issue should be in your mailbox not later than about 15 March. Please get me your subscription information as soon as possible so I can get your newsletter to you on time. Issue 107 may be a little late getting to you for this reasons.

You can email me your subscription information if you plan on paying for your subscription with PayPal. If you are overseas and want to receive the DBFN electronic version only, please take advantage of the lowest subscription rate (US rate of \$21 per year). I really look forward to this opportunity and hope WE can make YOUR newsletter a "must have" item in your Dragonfly toolbox.

Sincerely,

Jeffrey A. LeTemp

By Pat Panzera

I would like to thank Jeff for taking over the task of managing our newsletter. It's no easy chore, but if we put some effort into it, we can make Jeff's job a lot easier.

Please don't procrastinate with getting your payment into Jeff. To each subscriber, Jeff has the obligation to produce a newsletter. The price he charges is based on a minimum number of subscribers. Printing costs (per unit) go down as the quantity goes up. If that target number is not reached early in the subscription year, Jeff could find himself subsidizing the newsletter with his own funds, as I found myself doing.

Jeff has not raised the subscription cost over what I was charging, and I didn't raise the price over what Spud was charging. Looking through the back issues, I believe that I see that there has not been a price increase since 1997, when it went from \$18 per year to \$21. That's 8 years in a row with no price increase, and you KNOW that postage has gone up since then, as well as everything else.

Jeff also needs your help with articles. In the 3 years that I ran the newsletter, I did not receive a single unsolicited article, and many articles I had to literally beg for, and continually prod the contributor to produce. In fact, one reason this entire issue was written by me, is that I'm out of articles.

I honestly feel that the biggest reason that articles are not voluntarily offered to the newsletter is because of the internet. Many fine people who had something serious to contribute, by way of first flights, awe-

some x-country flights, or technical ideas, wrote their article, and sent it to the e-mail list instead of sending it to the newsletter editor. It's really tough to try and manage the newsletter, and keep it fresh. Most of the subscribers are also active on the e-mail list, and it's not fair to ask people to pay \$21 per year to read the same stuff they read on line (a month earlier) on the internet.

So I urge you, when the mood hits to write an awesome story to share with your friends, consider having it published in your newsletter first. If you want the immediate satisfaction of publishing it on the internet, please consider writing a condensed version for the net, and a longer, more detailed version for the newsletter.

The e-mail group is great for real-time information, but even though each and every e-mail is archived for future retrieval, the few gems are intermixed with tons of dirt. Weeding through some of the garbage to get to the few pieces of useful information can be a real drag, as in most cases, the subject line is not consistent with the body of the message.

Your gems belong in your newsletter, not lost in the mire of tens of thousands of inane e-mails. Additionally, when the articles are illustrated with photos, it makes a huge difference. Although you could do an excellent job on the internet, by creating a web page of even uploading a photo or 2 to the e-mail list photos section, it's just not the same. At this writing, over 35% of all the people in the database do not have internet access. By publishing to the internet only, you are robbing these people of some great information. So I urge you to please consider your newsletter next time you have a great story to tell.

Even if you don't think your story is so great, please consider contributing anyhow. Jeff can help you sculpt your story into something you can be proud of.

I've produced the whole gambit of story types in my 3 years at the helm of this great newsletter. By far, those articles about people's progress received the best reviews from the subscribers. So I ask you to please consider submitting an article on the current state of your project, and what it took to get there.

Many people have told me that they built a pretty basic Dragonfly, with nothing extra that would be worth reading about. I don't agree that a plane needs to have all the bells and whistles to be "worth" publishing in the newsletter. I believe that any and every plane and/or project is worth writing and reading about. We are a small community, and we are not growing as fast as we use to. We need to stay in touch, we need to share ideas and goals, and we need to encourage one another to get those projects finished and in the air!

Enthusiasm can be contagious. Sharing your enthusiasm may help to light a fire under a builder who has not been working as hard as he could, or maybe even light the fire under the owner who has been letting his bird sit, for the lack of a few minor repairs.

So please support Jeff's new adventure, submit those articles, pay that subscription, attend those fly-in's, do whatever you can do to help insure Jeff's success with the newsletter.

Over and out,

Patrick Panzera



For Sale: Dragonfly MK I N812RG, With HAPI 1835 engine, dual ignition, 40 hours TT, A&E, Terra TXN923 Nav/Com w/remote Tri-Nav indicator, new prop, always hangared, excellent condition, needs some engine and cowl work and touched up from sitting for too many years. Includes lots of extras, including all DF newsletters ever published. This has been a labor of love that I need to sell for several reasons. Located in central OH. Serious inquiries only. Asking **\$11,000**. Call or e-mail to discuss or for photos. Ronald L. Geese. (740) 964-9497
or email: rgeese1@columbus.rr.com

For Sale: Dragonfly MK II N189SM, with 80hp Continental A-80. 250-hrs SMHO by Skeezi Adkisson, and dual Savier electronic ignition. 3 blade Warp Drive prop w/ Gary Hunter blades. Curses 145-150 mph on 4.9 gph. 21+ gallon fuel capacity, dual throttles, hydraulic brakes, ELT, cabin heat, oil cooler and filter. Garmin 195, vortex generators, electric pitch trim. Asking **\$23,000** or possibility trade for 2 place side-by-side, tri-gear with turbo or bigger engine. See photos in a recent KITPLANES ® magazine, featuring details on electronic ignition. Call 618-594-2681 and ask for Terry,
or e-mail: troneill@charter.net

For Sale: Carbon Fiber NACA Inlets and Spinners. Spinners are **\$250 each**, including back plate, but w/o front bulkhead. Inlets are \$30 per pair, set in glass. Contact Charlie Johnson, 2228 East 7875 South, Ogden UT 84405 (801)-479-7446 or
e-mail: OneSkyDog@aol.com

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