DRAGGIN'

(Photo courtesy of Ron Wier)
Inspiration for the Draggin' Fly came from the Ramsey Bathtub, however, it is an original design, structurally.

FLY

(Photo courtesy of Ron Wier)
1600 cc VW, Montgomery Ward wheels, homemade prop, 4130 tubing and a nice, fat USA-35B airfoil . . . all add up to the Draggin' Fly, a pure and simple fun machine.

By Ronald D. Wier, EAA 10865
6406 Burgundy
San Diego, Calif. 92120

WHAT'S IN A name? Sometimes a play on words is necessary to achieve proper meaning. I feel the name chosen is fitting for more than one reason. The insect world knows a Dragonfly as a bug that has STOL ability, is certainly a high drag configuration, and not noted for speed among it's contemporaries. The name Draggin' Fly emphasizes that this ship is about as aerodynamically dirty as it is possible to be. Nevertheless it flies rather well. More about that later.

I had seen Bud Evans gain considerable success with his VP-1, which was tied down next to my Skycoupe, and became almost obsessed with the idea of a VW powered original that would be really different, easy to build, strong, utterly stable, and cheap to create and maintain. I was fascinated by the Ramsey Bathtub in the 1932 Flying Manual, but it was too big and involved too much cable rigging, not to mention that it's short wheelbase might give handling problems. Why not a smaller version with tricycle gear with steerable nosegear, use a triangular welded truss tailboom, push-pull full span ailerons as on my Skycoupe?

Why not, indeed? The tricycle gear would eliminate ground handling and landing problems, a tailboom truss with welded diagonals would be rigid without a myriad of cable fittings, and full span ailerons are effective, easy to fit with minimum air gap on the trailing edge, and using push-pull rods eliminates all cables and pulleys in the wing, not to mention the safety factor involved. If a cable or pulley breaks or jams on an aileron system, you've usually lost control. If a pushrod is lost on the Draggin' Fly, the unhooked aileron will trail in the airstream while the other aileron is still operable. I knew the ship would be slow, so for effective control at minimum airspeeds the control surfaces had to be generous.

Okay, I knew what I wanted, so I selected a USA-35B airfoil which is used on J-3 Cubs (you can't argue with success). I plotted a rib jig to use a 54" chord of which 6" was aileron, so the ribs netted 48" in length. A mess of 1/4" square spruce capstrip was ordered and I dug out the old can of Weldwood. I used 1 mm birch ply for gussets, and 1/4" coated nails. After a few days, I could knock out 3 or 4 ribs an afternoon, so in a week they were all done. The spars were ripped from 3/4" spruce planks and edges finished with a belt sander. Doubler plates for the attach and strut fittings are 1/8" birch ply.

This was in March 1971, and Bud Evans needed help in getting the VP-2 finished and flying in time for a magazine publishing date. We agreed on a fee (I needed the money for my bird), so I spent the next two months

covering and painting all the VP-2 surfaces in my garage. When the wings and tail were delivered, he was pleased with my work, and I saw the VP-2 had the engine mounted but not hooked up. So I spent some more time doing a lot of those last minute things. I finally got back to my own project after the VP-2 was flown.

My wings were assembled by laying the spars across two sawhorses and sliding the ribs on, using 12" centers, making a 12 foot panel. The end ribs are 1/4" ply with large cutouts for lightening. Drag wires are 3/16" Chromoly rod with threaded ends fitted into Harley Davidson motorcycle spoke nipples. The leading edge was formed on the upper side only with a roll of aluminum roofing flashing 14" wide, and nailed to the spar and leading edge strip 1/2" brads. The trailing edge is 1/4" ply strips with small blocks to carry the aileron hinges. Attach fittings are steel plate of conventional design. The ailerons are .020 aluminum strips 12" wide folded almost double in a brake and a 7/8" torque tube inserted in the gap and pop-riveted in place.

The bathtub pod is conventional welded steel tube, as are the gear legs. The wing pylon struts were added next, then a simple jig held the 1" tail boom longerons in the air while I cut and welded the 5/8" uprights and diagonals in place. The tail surfaces were built in place on the tail boom with no jigs required, they are simple steel tube structures. All tail controls are within the boom with push-pull to the elevators, and cables to the rudder. I expected the controls to be light on effort so no trim tabs were fitted. The stabilizer is easily ground adjustable. The wing struts are 1 1/8" tube with aluminum trailing edge fairings 2" wide taped on and covered with dacron. No expensive streamlined tubing was used anywhere, though it would have helped. The wheels are 3.50x4 Montgomery Ward catalog items, and are sold in sets of three. No brakes are used, the rolling inertia of the plane at low speed is small, the turning radius is sharp, so "S" turns or sharp circles at idle throttle can quickly bring it to a stop, especially when faced upwind.

The ship is covered with 2.7 oz. dacron glider cloth using the Stits process. Originally I had a 1200cc VW of 36 h.p. in it. I did the first liftoffs with it in ground effect, but could tell it was marginal. I couldn't afford a Hegy propeller for it, so I carved my own. It was a little too much for the engine, so I kept nibbling it down. Eventually it flew for the FAA this way and logged 8 hours, but I couldn't find enough 130 lb. pilots. I went to an auto wrecking yard and bought a 1600cc engine that was in terrible shape. After too many dollars, I felt I had built up a virtually new engine that should have reasonable power. I carved another propeller, ran a "reverse" weight and balance to get the new motor mount length, and changed over. The FAA was very helpful regarding the extra paperwork, and wished me well. Since then the plane has been flown by seventeen different pilots whose comments go like, "Man, that's something else", or, "It's a totally useless airplane, but it's fun to fly," or even, "It probably has the finest handling controls I've seen . . . the only airplane I know that can turn inside a Cub."

Strangely enough, from the first liftoff I did with it, the ship was in perfect trim, and no airframe adjustment has been made. No aerobatics have been done as it has no jury struts. I don't recommend them anyway as the ship is rather lightly built in some places, also the stock Solex carburetor of the VW car was never intended to operate on it's backside. The engine is uncowled so maintenance is simple, cooling is adequate, the oil temperature sets at 195 degrees. The engine parts are all stock, the prop hub is from Ted Barker Engines. I made a low profile intake manifold and hot air box for the carburetor. The fuel tank is fiberglass boat cloth and polyester resin laid over a cardboard mock-up. A hand hole was cut in the top after curing, the the cardboard ripped out, then the hole was patched. It carries 8 gallons, enough for over 2 1/2 hours flying.

Because of weight concentration near the center of gravity, no flight trim is necessary, changes in fuel or pilot weight seem to be nearly undetectable. In spite of light wing loading, crosswinds up to 15 knots cause little or no problem during landing or taxi, probably because of the low C G and the 5 foot gear tread. Rate of climb is about 300 fpm, it cruises at 65 mph at about 3200 rpm, will tweak up to 70 mph at 3500 rpm. Ceiling to date has been 4500 feet, but I blame some of this on the automotive carburetor, other VW conversions have done better at higher altitudes, holding the power curve longer. Stall is under 35 mph, stall recovery costs about 35 feet of altitude. Takeoff and landing roll are well under 200 feet, even in calm air. Due to drag the glide is steep, but no worse than many others. In fact it can virtually be dived at the ground and flared out just off the ground for a soft landing. Try that with a much heavier ship and you'll mush out the bottom of the flare resulting in bruises to your ego at the very least.

My ship weighs 470 lbs. empty, 688 lbs. gross allowing a 170 lb. pilot, and 48 lbs. of gas. No baggage is carried. As a word of caution, the cockpit is designed for pilots up to a maximum of around 6 feet tall. One pilot who flew it was that tall, and when I saw his knees trying to raise the instrument panel, I asked him if he could work the rudder. It seemed he could, but not for any discomfort factor over about 30 minutes.

In any event, the ship has met with all my expectations and exceeded in some. It never fails to evoke comment, and many of the skeptics about it's ability to leave the ground become profuse in their praise when they see it do it's thing. Looking back, I can say that it was fun to build, and a source of fun since. I've had a number of requests for plans and I hope to have something drawn soon. It costs me $1300 and 10 months, but well worth it.

Cold Fact: It is absolutely true that no plans or lines were drawn for this plane in advance of construction. All proportions were "eyeballed" as it progressed. The rib jig was the only exception. I built the wing with the rest of the airplane to fit. I have friends (EAA members) to back this up. It only shows that anything is possible from an amateur.

SPECIFICATIONS

Wingspan	**24'5"**
Length	**17'5"**
Height	**6'10" (to rudder tip)**
Wing Area	**110 square feet**
Propeller	**52" diam. 30" pitch**
Wing Loading	**6.25 lbs. per square foot**
Weight empty	**470 lbs. (with engine oil 2.5 qts.)**
Weight gross	**688 lbs.**
Nose Wheel	**Steerable, direct links to rudder pedals**
Fuel	**8 gals. (100 octane required for 1300 cc and larger VW's)**
Ignition	**Vertex Scintilla magneto (very reliable)**
Carburetor	**Stock Solex PICT-2**
Windshield	**1/16" Lexan**

Instrumentation: Airspeed, Taylor automotive altimeter 0-10,000', oil pressure, oil temperature, vacuum turn and bank, Westach electronic tachometer, cork and wire gas gauge float, magnetic compass.