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THE OFFICIAL VOICE OF DRAGONFLY BUILDERS AND FLYERS ALL OVER THE WORLD

DRAGONFLY BUILDERS AND FLYERS NEWSLETTER

Canard Contamination—Part 2

by Andrew Aurigema and Jeff LeTempt

In DBFN #111 we detailed what happens when the canard becomes contaminated. In this issue we will talk about what to do to eliminate, or at least greatly reduce, the pitch trim change and loss of lift the canard experiences when it is contaminated. It is quite obvious to me, all you have to do is stay out of the rain and don't fly near any bugs. Well maybe we should come up with a better plan.

I think it is worth mentioning that since each of our airplanes are built by different people that we often introduce errors and no two airplanes are going to be exactly the same. Some Dragonfly's may experience a significant loss of lift or pitch trim change while others may hardly notice any difference when contaminated. If your Dragonfly flies just as well when the canard is contaminated as it does when it is clean and dry, consider yourself fortunate and just skip over to the next article.

The long term solution would be to use a completely different airfoil for the canard. The Quickie Aircraft Corporation (QAC) did this when they designed the Q200. The canard on their Q2 used a similar (maybe identical) airfoil as used on the Dragonfly. When QAC started putting the Continental O-200 on the airplane they also changed over to the LS(1)-0417 airfoil for the canard. At least one Dragonfly has flown with the LS(1) and I know of two Dragonfly's being built with a LS(1) canard. Drew's Raptor is using a Roncz R1145MS airfoil for his canard. After an alternate airfoil is flight proven on a Dragonfly, one of these may become an option for future builders.

But what do we do if we already have a flying Dragonfly and we experience an excessive canard loss of lift when it is contaminated? I say excessive because some Dragonfly pilots may find it perfectly acceptable if the stall speed goes up 10 MPH on their one flight a year in the rain. This article is more oriented to those Dragonfly owners who feel uncomfortable with the loss of lift they experience due to bugs, rain or whatever. Several people have had excellent results installing vortex generators on the canard.

What the heck is a vortex generator and what does it do? In the simplest of terms a vortex generator is a small fence that extends vertically from the upper surface of the airfoil. The purpose of the vortex generator is to energize the boundary layer, more specifically with our canard is to make sure the boundary layer does not trip before it is supposed to.

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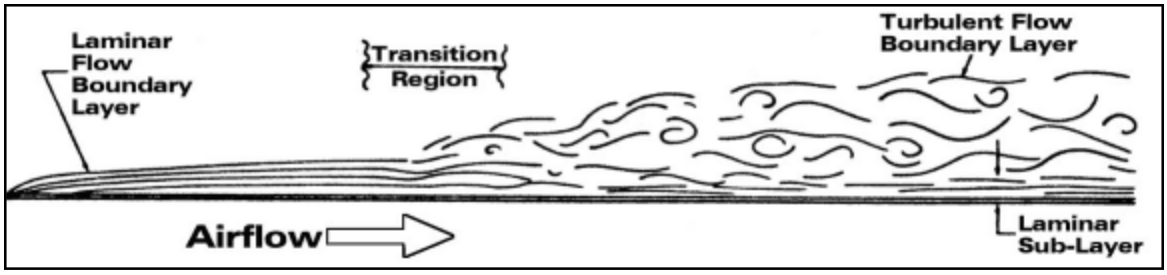
Vortex generator graphic from Harrison Designs LLC.

You will recall from DBFN #111 when we described how the canard was designed to maintain laminar flow back to about 45% chord line and how contamination on the airfoil could move this trip point from laminar to turbulent to about 25% chord line. This shift could result in a reduction of lift by 10% (or more).

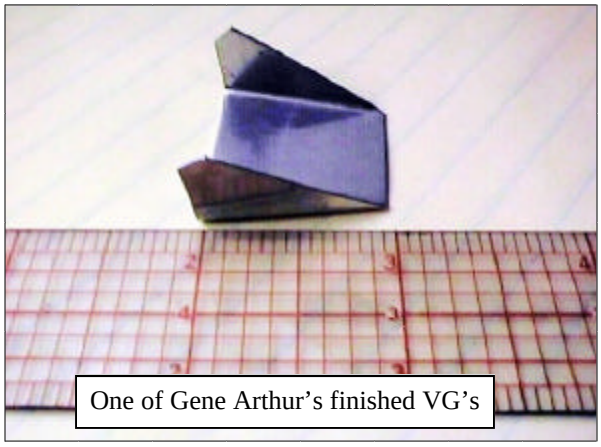
Vortex generators have been used for many years to control airflow. When I searched for "vortex generator" on the United States Patent Office web site there were hundreds of results. Vortex generators have been used on many things other than aircraft airfoils and there are many uses for vortex generators on airplanes. Vortex generators can accomplish many tasks such as lower stall speeds and improved low speed handling characteristics, resulting in an added safety margin for low speed flight, significantly improved low speed aileron control, better cross wind handling at low speeds, increased safety margin in the event of an engine failure, reduced take off distance, improving short field performance, and reduced tire and brake wear due to landing at lower speeds, resulting in less maintenance.

These claims were taken from a company's web site where vortex generators are sold and they may all be possible, but the single thing we are concerned about is keeping the airflow attached (boundary layer control) to the canard so we can keep that laminar flow area where it is supposed to be. The vortex generators are very good at doing this.

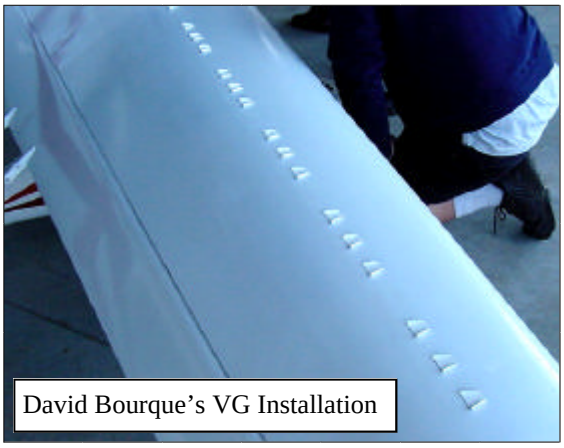


Since these little devices are so effective they must be very hard to make so they have to be very expensive—right? Would you believe me if I told you that you could make your own and install them for about the cost of a value meals at your local fast food restaurant? The materials can be purchased at your local hardware store and with a couple hours of work you can have them made and installed.

I do not know the exact details, but Nate Rambo developed the construction and installation of vortex generators for the Dragonfly. In September of 1989 Gene Arthur followed Nate's instructions and documented his installation. Their material of choice was .020 aluminum glued on with silicone. Several Dragonfly owners have used these instructions to build and install their vortex generators, including David Bourque (see insert on page 3 and photo below).



One of Gene Arthur's finished VG's



David Bourque's VG Installation

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There has been a lot of discussion about the chord wise placement of the VG's on the canard. The text book answer for the standard GU-25 airfoil is to place them at 50%, but some have commented that the VG's should be placed at the thickest point of the airfoil. The thickest point may or may not be at the 50% chord line. Remember each of our canards are different and our airfoil is probably slightly different than the standard GU-25 airfoil. You will see in the placement Gene used that the VG's were placed at about the 40% point. Some experimentation will be required to determine the best placement for your airplane.

David and Gene both used .020 aluminum for their VG's, but you can also use several other materials for your VG's. How about arrow fletching, plastic sus-

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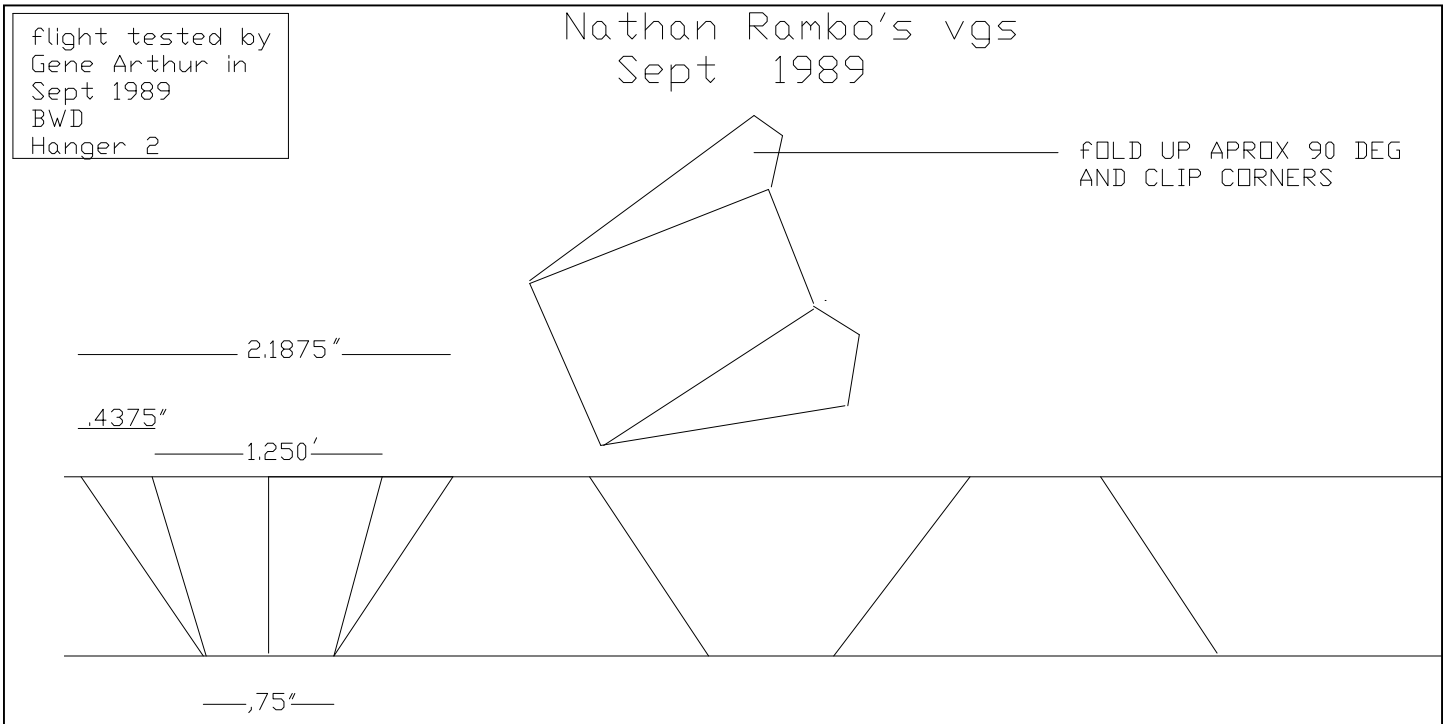
I made and Placed my VGs as per Nates plans, which is on the thickest part of the canard. We must remember that the GU is affected by bugs which contaminate the leading edge. So I assume that the airflow is being disturbed at that point and needs to be corrected at the thickest part of the wing. There is a huge difference between bugs and rain. The rain effect comes on slowly and takes a steady pull to correct. The bug contamination is not noticed till you get in the pattern to land, and the canard starts bucking at 90 mph. Two different problems one solution.

I had to remove some of my VG's because the stall speed of the canard was getting very close to the wing, but it flew hands off in rain and bugs with no problem. The question I have is at what speed will the wing stall at the high angle where the canard stalls with VGs installed? I think the wing will stall at a lower speed at that angle (20 degrees up, should be about 40 mph). I test flew the airplane with the canard stalling at 54mph, this was a very high angle and very uncomfortable, as I had no idea when the wing would stall.

Food for thought, David Bourque, Dragonfly N100HK



Fabrication:

1. Shear out a long piece of aluminum (.020" is ok) 1" wide.
2. Layout the VG blanks on the strip as shown above.
3. Shear off the fustrums of cones to make about 60 pieces.
4. Bend up the triangular tabs. You should nip of the sharp points to keep you from getting stuck.

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pended ceiling tile rails, or plastic sheet rock corner protectors? Mark Felling used clear plastic sheet rock corner protectors and had a total cost of $2.50 to make his VG's. It took him about 5 hours to cut out the VG's while watching television. Mark then spent about 1 hour attaching them to his canard with 100% silicone adhesive with a 6" spacing using Nate's placement instruction (chordwise).

Unfortunately Mark was seriously injured when his Revmaster powered Dragonfly lost power only a few hundred feet off the ground and he was forced to land in the trees on July 2, 2003. Mark did not have any test results to comment on with regards to the loss of lift due to contamination problem, but he did experience much better slow speed performance.

Keep in mind that the primary reason to install VG's on your Dragonfly canard is to reduce the loss of lift due to contamination. The thing that makes the Dragonfly a very safe airplane is the fact that the canard quits flying before the wing and basically makes the airplane stall proof. It is critical that the canard stalls before the wing. If you have not experienced this in a Dragonfly, it is almost a non-event. The nose of the Dragonfly just kind of bobs up and down and you start to pick up a slow rate of descent. Aft elevator stick pressure to stay in this condition is considerable, the canard wants to start flying again on its own. The entire time you will have full roll and yaw authority. If the wing were to stall before the canard, it would be considered a deep stall. Deep stalls have been a very bad thing for some airplanes configured with canards. Included in the newsletter is an article from Steve Laribee about deep stall testing in his Dragonfly.

Mark Felling's VG Test Results

	Without VG's	With VG's
Lift-Off	80	70
Climb (500-600 FPM)	110	75-80 or 110
Distance for 50' Obstacle	5000"	2800-3000'
Approach Speed	90-95	85-90
Final	85	75-80*
Short Final	80-85	70-75*
Touchdown	75-80	60-75*
Canard Stall	60 (700-800 FPM Descent)	Not Yet Tested
Cruise	130-135	Similar**

IAS in MPH @ 1050 pounds

* The slower IAS's shown are attainable on Final, Short Final, and Touchdown, etc. however are in a bit nose-high attitude / angle-of-attack reducing visibility. The higher number shown seems more comfortable.

** Cruise Not Yet Tested Fully, but from speeds in pattern I could not notice a difference.

Mark Felling's VG Installation

David Bourque used Nate's instructions and after flight testing he decided to remove every 4th VG. David was able to achieve a slower stall speed and felt a little uncomfortable with the high angle of attach that he was experiencing. He

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Hi all,

I now have 30 hours on my Dragonfly with the Land Shorter VG's installed on the canard. I flew to the Sullivan 2004 fly in and caught up to the front with rain in it on my last leg from Coffey Co, KS. I flew into light to moderate rain as I crossed the front. At times forward vision was obscured with rain on the canopy but I would not consider it heavy. The usual stick forward pressure was not present and the puddles that used to sit on the elevator did not form.

I have to conclude that the aero guys are right and the separation bubble is not forming. The VG's are put on at 50% chord with 4" single spacing and alternating 15 degrees to the centerline of the plane.

I flew the performance run at Sullivan closed 3 leg near 100 miles around. This year average speed 136.12 mph compared to 136.5 mph last year. We took off the opposite direction this year and had to make a turn back to the course after the timer started which accounts for some of the 0.3 mph loss in speed.

You do have to hold it on as it wants to take off below 60 mph. It will take off but you will be in a high drag stick back in ground effect condition. Trying to climb out slow has put people in the trees in Dragonflies from what I can gather. I know the VW does not have enough excess power to climb out of ground effect that far behind the power curve. Stall speed power on went down from 63 to 60 mph and I need to do some power off stalls.

Based on my limited field testing I endorse VG's for the GU canard, even though they are ugly. Putting them on is a lot easier than building an LS-1 and they make the GU rain performance problem a lot better.

Regards

One Sky Dog

VG Sources	
The VG Guy	**CCI**
http://www.landshorter.com/ Harrison Designs, LLC. P.O. Box 365 Kootenai, ID 83840 1-877-272-1414 (toll free)	http:// www.vortexgenerator.net P.O. Box 494 Milford, NJ 08848
$99.95 for 100 VG's including delivery inside US	$85.00 for 100 VG's including delivery inside US

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was concerned that he might get into a deep stall situation. Like most Dragonfly's, David's plane experienced a loss of lift and pitch trim change in the rain. After he installed the VG's, this problem just no longer was a problem.

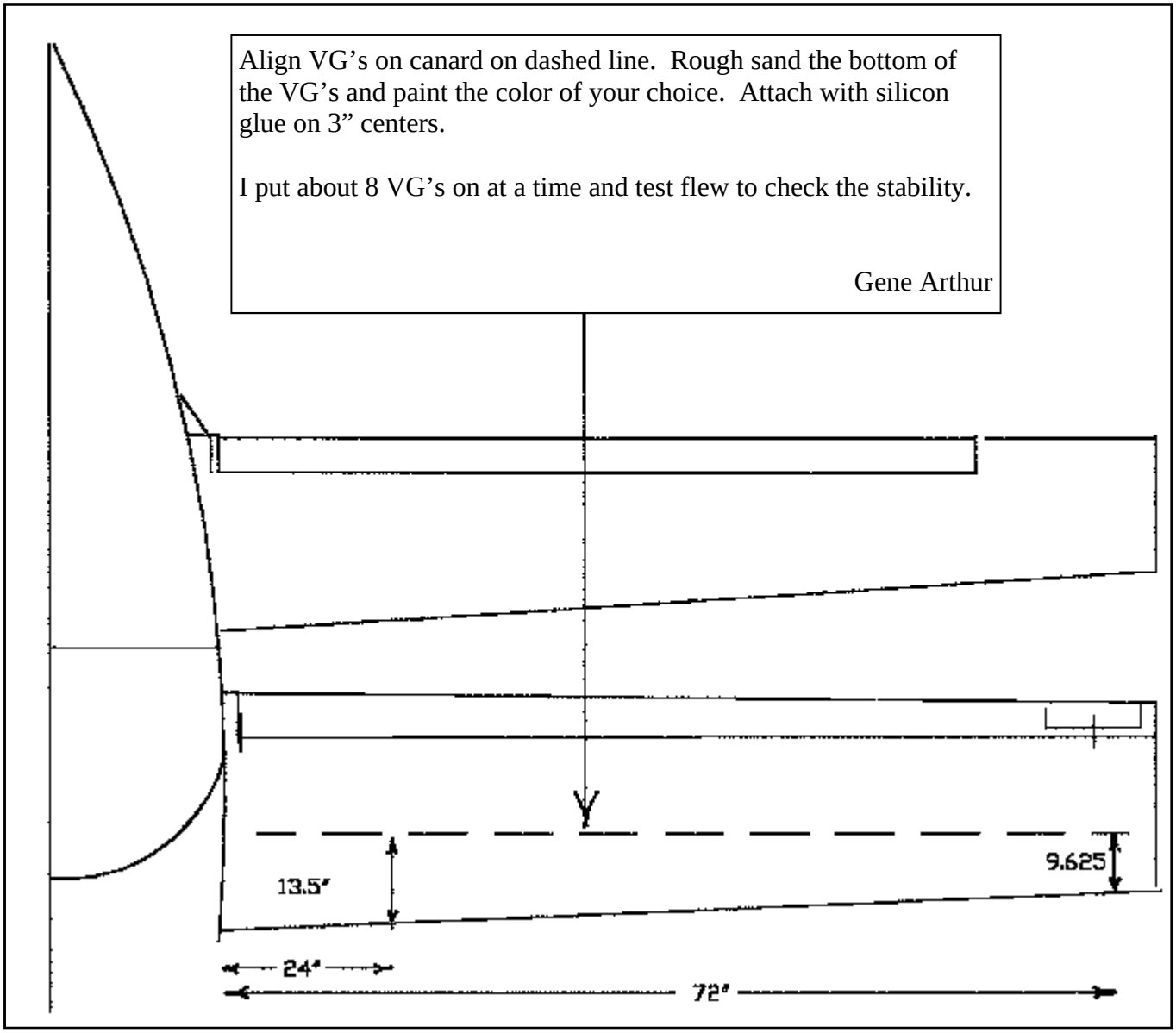
These homemade VG's are easy to make, but some guys will want to fork out a few bucks and just buy some VG's. They are very nice looking and not very expensive. I have included two sources for VG's that are intended for use on experimental airplanes. There are many different sources for VG's, but some of them are very expensive. For less than $100 you buy some nice looking flight proven VG's.

Charlie Johnson (AKA—One Sky Dog) bought a set of VG's from Harrison Designs and has been very happy with the results. See the insert on page 5 with Charlie's comments. Charlie followed the advice of Justin Mace when he installed his VG's.

Anyone who has been around the Dragonfly for more than a day or 2 has certainly heard of Justin Mace. As I mentioned in the last newsletter, I was very fortunate to have had the opportunity to fly with Justin about 2 years ago and this was my first exposure to loss of lift due to contamination. Justin decided to install some CCI vortex generators to fix this problem since he flies in the rain so much in Arizona. I think Justin told me that it rained a few months ago for the first time since my visit almost 2 years ago, but when you fly your Dragonfly as much as Justin does you never know where you might end up. Justin provided a very detailed report on his VG testing that you will find on page 6.

I hope you have found this series of VG's informative and helpful. Please keep in mind that each of our planes is a little different and may not react the same as the planes that I have detailed in this issue. You can temporarily install your VG's with double-stick tape and once you have determined the optimum location and spacing for your plane you can permanently install them with silicon adhesive. Please proceed with caution!!!

Jeff



Hi Jeff & gang!

BACKGROUND: I originally got interested in the Dragonfly design after a demonstration ride with Rex Taylor at Eloy, AZ. I ordered a Task kit and started construction soon after. My plane first flew Easter of 1986 without paint & weighed 600 lbs. Paint and wheel pants saw the weight balloon to 660 lbs. The original engine was an 1835 Hapi VW. It soon became apparent to me that the 1835 VW was way short on HP & I installed a 2276 cc VW with the help of Rex & Pat. That was about the time that Rex had problems with his new big engine breaking crankshafts. Well mine broke but at a different place, I then installed a 2.0 liter Subaru EJ-22 with stock multi point fuel injection & electronic ignition. I flew it for right at 500 hrs. It was an unleaded gas engine due to the computer and O2 sensor and I got tired of carrying unleaded gas. I sold the package to a fellow that "just had to have it" and then I installed the O-200 that I am now flying with & just love the "real" airplane engine.

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During the early years of flying my Dragonfly, there was another flyer in Southern California that was having problems with bugs and rain on his canard. Nate Rambo designed and flew the first VG's that I had heard about on the Dragonfly. After a little research I decided that I would like to have them on my Dragonfly. Well about 15 years passed & I had done nothing about it. My only real problem was the one time in 1000+ hours the old Dragonfly had been bugged up to the point that the stall speed went up to about 105 mph. I had to maintain 110 on final & remember wondering if the 4,500' runway was going to be long enough. I got loaded up with White Flys. When I landed I noted that the visibility was a little "foggy", it was all the Flys smashed on the canopy. In looking closely at the wings, the leading edges and back a few inches appeared to be "fuzzy" almost like a towel. The plane flew OK, but the stall speed went up more than I was accustomed to. That, hopefully will be a once in a lifetime experience. The VG's I installed have taken away any and all contamination problems.

I had flown in moderate rain & had a nose down pitch that was easily controllable, but still did nothing about it. I had experimented with cord wise sanding with 600 grit wet or dry on the leading 40% of the canard. That seemed to help with the nose down pitch associated with light virga, but didn't really help in heavy rain. Jeff got the chance to fly with me and on short final we ran into some very light rain. There was some nose down pitch, or so Jeff tells me. He was flying, I had to help him pull back on the stick to make the landing. It wasn't that bad of a landing, I've done much worse alone Jeff!

ON TO THE STORY: I had seen a few Dragonfly's that had home made VG's installed & didn't like the look of them so I ordered a set of CCI's from Art. Art's instructions said that the VG's should be placed in pairs at 1" centers at the 50% cord line. One set was not going to be enough so I ordered a second set. After receiving the second set I went to the plane and laid them out on the wing. WOW, that appeared to be way too many VG's. However, I thought that instead of 1" spacing I would use 2" spacing and place them where everyone else had placed theirs at the thickest part of the wing, not the 50% cord. I modified the template that Art had sent and installed them just aft of the thickest part of the wing.

THE TEST: After letting the RTV dry for a couple of days I just had to fly & see if the VG's really did make a difference in dry flight. WOW, do they ever. With normal trim I had to use full forward stick to keep the front end from flying just prior to the main/rear wing lifting. It seemed like they were providing much more lift to the front wing. I flew the pattern and decided to land and see just how slow I could go. I normally land by flying just above the runway 6" or so and let the speed decay until I can't hold the plane up any longer. Normally the tires just start rolling. Well this time I held the mains off and soon the tail wheel was rolling along the runway with the mains still in the air…...this was something new for me. I normally had to have everything just right to touch the tail wheel at the same time as the mains. I went around and tried another pass, this time I thought I would keep just a bit of power on. Well, was that a surprise. I did the same type of landing and kept the mains off and added just a little bit of power. The nose started coming up & kept coming up with the tail wheel still on the runway. I decided that was too scary for me, so full power and a little less lift and I was back in the air.

With close to 1000 hrs in the plane it was like flying a very different plane. I did not do any full stalls at altitude with this setup, it was just too different. I removed every other pair of VG's & found the plane was almost back to normal with just a little extra lift at the front. So now I was at 4" spacing for the pairs set at the thickest part of the wing. I then had a chance to fly into a small shower and found that there was no nose down pitch associated with moderate rain. Like Charlie, I saw no puddles forming at the rear of the wing, the water was just flowing off. I gave a ride to a gal with a few small showers in the area. I didn't try to find the rain because we were on a sight seeing flight, but a moderate shower found us. There was no nose down pitch at 120 to 125 knots in moderate rain, how fun was that. It was just great. While heading back to the airport

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another shower found us only this time it was more than moderate. The visibly forward went away then I could no longer see further than 1/8 mile off to the sides. The rain was very heavy for about a mile. There was a slight nose down pitch noted but a 1/8 turn on the vernier controlling the reflexor and the pitch was again hands off. Another good reason to have manual control of the reflexor not electric, a little goes a very long way on the reflexor.

In talking to my hanger mate who built a Q-1 and is flying a C-120 he said that his Cessna will have some nose down pitch in heavy rain. I now feel that it is OK for the Dragonfly to have a slight nose down pressure in heavy rain. It was still raining when we got to the airport, I flew the pattern at normal speeds and flew the final at normal dry speeds, the landing was made at normal dry speed with a passenger and 1/2 fuel. What a great test of the new VG's. After removing every other set of VG's I found that I really liked the way the DF flew. Since I had a full set of VG's extra I decided to install some on the rear wing to see what would happen. I only added them in front of the ailerons at 4" spacing at about 15% cord just to see what would happen to the aileron control. Nothing changed, the aileron feel was the same at speed as well as slow. There appeared to be no change in the lift or performance of the back wing. So not being a full test pilot I sold the extra set of VG's.

CONCLUSION: I like the way the plane flys in the rain and bugged up with the VG's and I highly recommend them. I understand where Art is coming from regarding placement of the VG's. They will probably work as well with 1" spacing at 50% cord. However, being a homebuilder that is always looking to save a buck or two, the 4" spacing at the thickest part of the canard appears to be very adequate for the full span extreme negative stager bi-wing that I am flying. There might be a small speed penalty for installing the VG's at the thickest part of the wing but that is something I am willing to endure.

Stall speed, if it has changed it is only 1 or 2 mph slower, not enough to talk about. As for cruise speed it is very close to the same, I may have lost a couple of mph but not more than 5. I can still cruise at 140 -145 kts. There is a down side to having VG's on the canard, they make it a bear to wash. I have cut up a nice car wash sponge hitting them & still didn't get the wing clean next to them.

That’s it for now! Keep on building/flying it's a great little plane.

Justin Mace flying N764JM

Dragonfly Deep Stall

by Steve Laribee

Preface…..you will see in this article by Steve that a deep stall in his Dragonfly was not a big deal. The key word is HIS. Each and every one of our planes is a little different and we should assume they will not perform exactly like someone else’s plane. As with all flight testing you should proceed with extreme caution.

Jeff

A wise person said that, those who do not learn from history will be destined to repeat it. This is some of my history with the Dragonfly. I was at Oshkosh in 1980 and got to meet Bob Walters and his new aircraft (the Dragonfly). I had

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been a member of the EAA long enough to learn not to buy into a new type of aircraft until you see them on the flight line. An article in Sport Aviation (October 1981, pp. 63-67) by Burt Rutan caused me to choose the Dragonfly over the Quickie. In 1983, three Dragonfly's were on the Oshkosh flight line and I spoke to the pilots of each. I liked what they told me and ordered the first complete Dragonfly kit produced by Task Research.

Career changes kept me from starting the kit for several years. I visited Task Research in 1984 and they told me to not build the canard until they released the MK II gear. While waiting for the new gear I studied Reg Finch's article on his Finchtip (Sport Aviation, March 1984, pp 40-41) and built a set for the canard. "This wingtip works by reducing the induced (vortex drag) to a bare minimum. It extracts lift out of the remaining weakened vortex and using the gentle persuasion of pressures, pushes the vortex outboard, thereby increasing the effective span." My thinking was that if they didn't work for the Dragonfly, I would cut them off.

Steve Laribee's Dragonfly MK-II

I first flew N88SL in 1988 and the fiber glass gear legs failed after about ten landings. There were a number of fiber glass gear failures at this time. I developed a steel gear that would fit the gear box in my canard (see DBFN volume 39, January-February 1992, pp 8-10 and volume 53, May-June 1994, pp. 3-5 for details on this gear).

Bob Walter told me that if I wanted it to fly like the prototype I needed to build it like the prototype. The only change I made was the Finchtip, 22 feet canard and the MK II steel gear. The engine is a Limbach L2000, 70 hp at 3000 maximum cruise rpm, using 4.4 gph. The propeller is 54 inch – 48 pitch and will move the aircraft at IAS of 135-150 mph depending on the air temperature. The empty weight is 671 pounds. The climb rate is 500 to 1200 fpm depending on weight and air temperature. It has climbed to over 15,000 feet and could have gone higher.

My Dragonfly was put through an extensive test program. The test pilot is an aero engineer who has flown Baby Great Lakes to business jets. The person writing the test program has 32 years as a Navy pilot and many of them as a test pilot. Between the three of us we have eight college degrees. The canopy could be jettisoned so the pilot could bail out if control was lost. I had to remind the Navy pilot that we were not testing an F4 as the test envelope kept expanding.

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Using full power to do a power on stall, the IAS will slow to 60 mph and then hold that and climb at 300 fpm. This held true as the angle of attack was progressively increased. If power is removed it descends at 500 fpm. When I give check rides to pilots, they don't think it has stalled and pull the stick all the way aft using both hands. They still don't think the aircraft has stalled until I point to the VSI which is showing a descent of 1000 fpm. One of the more interesting check rides I give was to a NASA space shuttle pilot (DBFN 67, September-October 1996, pp 9 & 12) who was amazed at what it could do. N88SL on down wind can be slowed to a canard stall and it will fly the pattern at a 500 fpm descent and power is only used to stop the descent to land. My aircraft does not stall with full power and acts like a glider with the power off. This could be the results of using the Finchtip on the longer canard.

At the end of the test program the test pilot wanted to see if the aircraft would recover from a full stall of both wings (deep stall). At altitude he pulled the nose up to a high angle of attack and cut the power. The aircraft descended at about 1000 fpm with the nose up. All controls; elevators, ailerons, and rudder had no effect on the aircraft. He let it fall to see what it would do. The nose slowly came down and as it approached level flight he added full power which gave him rudder control and started pulling the aircraft forward and it was out of the stall. The nose did not fall below the horizon and he estimated it lost 1000 feet. He believes that if he had gone to full power when it quit flying he would have recovered in 500 feet. Having shown that N88SL will recover from a full stall he did say that he was not going to do that again. I asked him if he would have left the aircraft if he was having trouble recovering control and he told me that he was hoping that he would not have to make that decision.

I fly my Dragonfly cross country and it has flown in light to heavy rain and it has not caused any control problems for me. I increased my landing speed 10 mph if landing in the rain. It also handles cross winds nicely as I have landed several times with 25 knots 90 degree winds.

The canard is very sensitive to minor airfoil changes. Those of you who are having problems need to carefully check the airfoil shapes using external templates to see that they conform to the design airfoils. If your airfoil shape is different than the original design it could cause a severe degradation in performance, flight behavior and safety. This is more critical for low speed flight conditions than for cruise and high speed because of loss of pitch control power and lifting capability along with increased drag. Don Hewes' three part article in Sport Aviation is an excellent resource on the effects of rain and bugs on the flight behavior of tandem-wing airplanes ("Effects of Rain and Bugs on Flight Behavior of Tail-First Airplanes," May 1983, pp 36-41, June 1983, pp 48-57, July 1983, pp 61-64). He is a Dragonfly builder and has 33 years experience as an aero research engineer specializing in dynamic stability and control at NASA's Langley Research Center.

Those of you who believe the Dragonfly's canard is the GU 25-5(11)8 airfoil as used on the VariEze tail should read this article. Quoting from his article, "Examination of the Dragonfly templates given in the plans revealed that the tail (canard) airfoil is different from the standard GU 25 airfoil in that it is slightly thinner and the maximum thickness appears to be moved slightly forward. When I asked Bob (Walters) about this, he stated that he was concerned about the abrupt contour change of the GU 25 section and made the modification to help eliminate the separation tendencies encountered with the VariEze tail." "It is pertinent to note here that an airfoil developed independently for another application by airfoil designer John Roncz, whom I have consulted, matches closely the contours of the Dragonfly airfoil. John's study shows that his airfoil is not as sensitive to flow separation problems as the original GU 25 section. Thus, since the two airfoils appear to be quite similar, it is probable that the Dragonfly airfoil truly is effective in minimizing the pitch down problem as Bob's results have indicated."

I was very careful in the construction of my wings and I do not have the pitch down problem some of you have. For example, I landed at a newly mowed grass strip to visit friends. When taking off, the propeller picked this grass up and covered the leading edge on the right canard. I did notice that the stall speed had increased but had no problems in landing. It was only after I got out of the aircraft that I saw what happened. I had discovered that it will fly with a very contaminated canard. Still, I now use my 1939 Aeronca when I want to land at grass strips.

Steve Laribee
N88SL

Editor Ramblings

Well guys this brings to a close my first year as the DBFN editor. I hope that I have served you well and of course I always welcome your comments on how to improve the newsletter. As I stated when I took over as the editor, I want to provide you a technically oriented newsletter. For the most part I think I have succeeded in this goal, but I have published some non-technical articles. One that comes to mind was Tim Iverson's cross country flight report. I received more feedback about Tim's article than any other article…..it was all positive. Tim's report motivated many of you to go out and work just a little harder to get your Dragonfly in the air.

Thanks to all of you have got me your subscription renewal for 2005. As I stated earlier, I am going to try something a little different for 2005 by offering a reduced subscription rate for electronic only subscriptions. Only time will tell if this is going to work or not, I have had several people take advantage of this offer.

Many of you have offered your thanks for my efforts as the editor—thank you for the very kind words. There is a considerable amount of work that goes into publishing this newsletter and it is very important for me to get you a high quality newsletter in a timely manner. I am sorry this newsletter is about 10 days late getting to you. Things have just been crazy for me for the last few months.

I do need your help. As you know this is your newsletter and I need articles and pictures from you to make this newsletter worthwhile. Please send me an article for publication. Thanks!!

Jeff

Classifieds

For Sale: 2 Dragonfly Projects. 1st unit (pictured) is 80% completed Task Research fuselage, All controls installed w/latest mods to include tail- wheel steering mod (DBFN 107), hydraulic toe brakes, servo tabs on elevator & ailerons and electric trims on both, electric reflexor unit, interior package in (light tan leather & cloth), fuel tanks installed, Lycoming 0-235 C2A W/ 1157hr. since NEW. Jeff Rose dual electric ignitions, light weight starter, Air Wolf remote oil filter/cooler system, Terra Digital 760 Com and 200 Nav W/G.S, Terra 840 Intercom w/3 light MB, Terra electronic CDI unit with GPS or Loran input display and auto pilot output, Morrow 618 (round) full data base loran, Narco AT 150A Xponder w/encorder, Whelen tail/nav/strobe kit, 6ea Ray Allen electric servos, PC700 vertical card compass, and 25 year collection of engine instruments, wheels and brake units, etc.

2nd project is a standard Dragonfly built from plans. Fuselage sides & belly pan and bulkheads done, wing completed, and all foam for rest of plane is cut ready to glass, all glass to finish and carbon fiber included , nearly complete Ken Brock metal control kits, Fiberglass hoop gear, wheel and tires, brakes, + more,

Take all for $16,000 or best offer. Philip Tinlin, 17 Andrews DR, Daleville AL 36322, E-Mail pc.tinl@juno.com
Phone: (334) 598-2287 or (334) 379-9410

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For Sale: Dragonfly Xpresso. Fast Subaru 150 HP turbo charged engine taking Xpresso up to 200 mph. Only burns 7 gallons per hour. New radio, transponder, and vortex generators. $25,000 or best offer. (I want to get a 4 seater). Call Thomas Cheatham in Basalt, Colorado at (970) 927-0227 or (970) 404-1678.

For Sale: 1836cc engine complete from prop spinner to firewall for a Dragonfly. All new engine with four hours run time. Dual ignition (one slick magneto and one electronic). Exhaust system complete with heat muff and carburetor heat box, Hapi ultra carburetor, Spin on oil filter, hydraulic lifters. The engine cowling also goes with this, so you will have a complete firewall forward for a Dragonfly. A/P built, $3500.00 Call Joe Anthony at (636) 828-8015 or email hjoe@acer-access.com for pictures or additional information.

For Sale: Continental PE-90 engine (a rebuilt GPU engine) 0-315. This engine has been started to be converted to aircraft use, dual plugs, oil tank and intake started but not finished welding. One magneto, all continental accessories will fit this engine. $1500.00 Call Joe Anthony at (636) 828-8015 or email hjoe@acer-access.com for pictures or additional information.

For Sale: NACA Flush Inlets designed for 1/2" sandwich structures. These make a good looking functional inlet to replace the hand carved per plans ones. Inlets are $40 per pair, plus $4.00 shipping. Note: Spinners no longer available. Contact Charlie Johnson, 2228 East 7875 South, Ogden UT 84405 (801)-479-7446 or e-mail: OneSkyDog@aol.com

Wanted: Longtime Dragonfly builder Bob Boydston from Sedona, AZ needs some SureFire II dual electronic ignition parts built by HAPI several years ago. N12BB was inspected last year, but has not been flown yet due to ignition problems. Bob would like to hear from anyone who has any of these parts they would be willing to sell. Phone (928) 282-6468.

For Sale: Dragonfly Type 1 converted to hoop gear. Porsche 1800 engine (big VW) converted to 2400 with parts from Great Plains. Airframe complete & wings & control surface mounts are finished. Cleveland wheels & brakes. Ed Sterba prop. Very nearly complete. Asking $10,000. Call 815-397-1533 or email stieggrinding@aol.com

Subscriber's Information

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For hard copy back issues send $4.00 for each issue to Jeffrey A. LeTempt at the above address.

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