Subject: [c-a] VG questions, comments
Date: Wed, 29 Mar 2000 22:29:40 -0500
From: "Jim Price" < hilong@Home.com>

To: "Canard-Aviators" < canard-aviators@canard.com>

[The Canard Aviators's Mailing list]

I'll comment on a few points my friend Byron McKean brought up + add a few comments that I've received.

<<To Jim Price, Could you point out several things that must be considered in using VG's for the purpose of a slower stall speed. First, the location of the VG's for the purpose of lowering the stall speed is different from the location of installation for solving the in rain loss of lift. TheVelocity does not have an in rain problem with loss of lift.

### Second,

thenumber and spacing of the VG's and the ratio of VG's on the canard in reference to the wing is most important because the increase in lift, i.e. lowering of stall speed, must never allow the main wing to even approach stall before the canard.

And third, each different type aircraft and even each individual aircraft will respond differently. This is no area to be playing around with without careful consideration and probably a gradual approach in testing to reach maximum benefits. There is no question that properly installed and tested VG's for the purpose of lowering stall speeds is the best safety measure that has come along recently. Flaps could do no better and cost and weigh far too much, look at Beechcraft and their Star Ship!

Best Regards, Byron McKean>>
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JP 1. Byron's point is that... I put my VGs on at 20% of chord (main & canard). For the rain trim pitch fix for the GU canard, the vgs are placed much further aft. The data that I generated in the wind tunnel indicates that additional lift that the vgs will generate falls off radically when vgs are placed aft of the 20% of chord position. I have been told by one person that the vgs in the 20% position (the position that I use) will not help the rain pitch problem that a GU canard can have. In other words the vg(s) for rain and added lift applications are compleatly different. I don't have any experience about the Velocity canard in the rain, so I'll just leave that one as Byron stated.

<<Second, JP 2. I use 9" spacing between each pair of vgs & each pair is 1.5" apar
and 20 degrees off wind line (remember the sweep of the main wing). 12 pairs
on each side of the main airfoil & 6 pairs on each side of the canard. I
did find that max lift was generated at 4" spaceing. I ended up using the
9" because it gave me what I wanted without adding too much drag. Wind
tunnel data gave me a 25% increase in lift with a 2% drag increase with the
4" spaceing. Byron's point is that one would NOT want to add vgs at the
positions that I have without adding the same number to the main wing.
Never, ever think of putting vgs on the canard at the positions that I have
mine without having the same number and spaceing on the main wing. Remember
that the GU canard rain fix is a different application.</pre>

JP 3. I thought that I would find a different optimum position on the main vs the canard .. (i.e. different airfoil) ... wind tunnel data indicated that they were the same. Friends have tried vgs on the Veri with a GU canard + Cozy and found the same position works well for them. .. I have only tested the Long-EZ main wing & the Roncz canard. As Byron stated & I did before, one needs to be careful. I would never install vgs without doing

a proper flight test program. FYI .. I used tufts to assure that the canard would always stall before the main wing would.

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A couple of additional comments that I received on this subject that I thought I'd pass on... (thanks Sam & Ken & Art!)

<<I found the vgs have helped me get slower approach speeds. A couple of years ago I was able to demonstrate some slow flight at Rough River fly-in & I amazed some of the folks watching.>>

### Jim,

A hearty Amen to that amazement. I have never seen an EZ fly so slowly. On several of the passes, you demonstrated full aileron control at a speed well below what any EZ I have ever seen is capable of reaching. I know you did a lot of wind tunnel testing and proved the science with your world records.

Bravo, we need people like you expanding the envelope. Just don't eat any more guardrails!!

# Sam Chambers

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### Carl

I have been using vortex generators for the last 200 hrs. Both on the canard and on the main wing as shown in the CSA and Jim Price. Works great as it reduced my landing speed by 10 mph.

## Ken Brimmer Cozy III (ESN) Maryland

<<Please guys, be careful! When I sold you those VG's I cautioned you to
resist the temptation to exploit the slower landing speeds that VG's make
possible. You still need reserve lift to flare the airplane before the mains
touch. Bleed off too much of that energy on a very slow approach and you may
find the canard stalling when you need it most and yourself digging a long,
expensive trench down the centerline of the runway.</pre>

I manufactured these VG's to elliminate the trim losses of the GU canard and while I am pleased that the nice folks at Velocity found them helpful, and others too, I do not want you to start making unreasonable or dangerous demands on the application. Everything has its limits.

### Art Bianconi>>

JP... I haven't ever tested the style of VGs that Art sells. I use ones that are T stock 1" L x .35 W x .25 H. As understand Art's vgs are triangular. I tried different shapes and they didn't provide as good results. I'm glad the everyone is saying be careful.

I don't find any detrimental handling qualities with the set up I use .. quite the contrary. I have much improved pitch and roll authority and I'm better able to control the slight dutch roll that one gets at lower speeds because of improved aileron control authority. The point is well taken, that one needs reserve lift on a approach, i.e. .. One doesn't want to fly an approach at stall speed.

Thanks to everyone for their comments & happy Flying! Jim Price

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