

VELOCITY VIEWS

Volume 27

Elsner First Flight

By Lynn Elsner from Crete, Nebraska



Lynn Elsner (left) is congratulated by Duane Swing following his first flight

It's hard to believe that I'm actually flying my Velocity after 4 months of building — start to finish! It all began when I visited the Velocity booth at Sun 'n Fun and Oshkosh, and was impressed with this 4-seater, state-of-the-art, high performance aircraft. Then came Copperstate Fly-In in Chandler, Arizona in October of 2000 where, after a demo ride and a visit with Scott Baker, I made the final decision to build a Velocity.

After I convinced my reluctant wife, Sue, that she could help me with this project, we left for Sebastian, Florida in our motor home. We arrived January 11th and started building shortly thereafter. I

decided on the Standard RG and opted for the fast-build program, hence, the fuselage and wings were already built. I received factory assistance from Travis Holland for a couple of months and, of course, gleaned insight from Scott and Duane Swing —airplane gurus — on several occasions. The nice thing about being at the Service Center is being able to avail myself of the expertise and knowledge of the staff here, as well as looking at other airplanes in various stages of construction.

I chose the Lycoming IO-360 engine and MT-Propeller constant speed prop. Some modifications that I made included cutting out the sides

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Elsner First Flight Story

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Scott Swing (left) and Lynn Elsner celebrate after first flight

of the keel to give more room for the seats to slide. I glassed in the pilot's side and made a removable hatch on the copilot's side for inspection. For easier access to the back seat, I hinged the copilot's seat to move forward and up under the panel. I also cut out space and added windows in the lower strakes for back-seat ground viewing.

Aerotronics in Billings, Montana, and Wayne Lanza of Composite Designs, who works here at the Service Center, wired the panel. Since I wanted a different panel, Wayne (who we renamed the Wiring Wizard) designed the layout of the instruments with his panel planner and added an imprinted overlay over the panel. I used the XL overhead switch panel with the same overlay. The panel turned out unique and we are happy with it.

Jeff Driscoll, whose auto interior shop is a few miles from here, has completed the seats, which my wife and I designed. He will be finishing the interior shortly.



Lynn & Sue Elsner pose with FAA DAR John Murphy during FAA inspection



Elsner's Velocity RG flying first flight in primer over the Florida coastline near Sebastian airport.

The Weight and Balance check showed the plane at 1,384 pounds. The FAA inspection with DAR John Murphy (pictured) went well. Of course, I utilized the flight-training program here with Nate Rigaud. He signed me off after the 3rd flight.

After some taxi runs by Scott Swing and myself, I decided to perform the first flight. So on May 30th I was airborne — with Scott Swing and Scott Baker flying behind me in the SUV for a "bird's eye view". The airplane needed no trim. All of the cylinder head and exhaust gas temperatures were within normal limits. The new NACA ducts on top of the fuselage really worked great for cooling. Everything else seemed fine. After 20 minutes of circling the airport, I landed in a state of euphoria! I have made 4 additional flights to date (June 1) and have accumulated 2.5 hours on the Hobbs. So far, I've only had to make some minor adjustments with the landing gear micro switches. My last flight showed a vertical climb of 2000fpm, and at 3,500 feet agl I was indicating 170 knots at 24 squared. The only disappointment so far was incurring a sizeable nick in the leading edge of the propeller, which was picked up from something on the runway.

Our time in Florida at the Service Center has definitely been a learning experience as well as a rewarding one. We have met a lot of nice people and made some lasting friendships. I would like to thank Scott and Duane Swing and the entire Velocity team for their assis-

tance and vital part in the building of this aircraft.

Flying our Velocity is a fantastic experience and truly this pilot's dream.

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And From a Wife's Perspective

By Sue Elsner, Crete, Nebraska

"What do you mean we're going to Florida for the winter? Our winter home is in Arizona and I have commitments there! Live in a motor home for 5 months with 3 dogs ... have you seen the size of that closet?" Countless things ran through my mind, but running away wasn't an option — so I did what every good wife would do, pray first ... follow my husband, and try to be interested in his interests. One friend called it an adventure; another said it was crazy. So off I went on the "crazy adventure"!

I had to look on a map to see where Sebastian, Florida was — on the coast — not bad. I filled our motor home with everything I thought I would need for 5 months. Lynn didn't even notice that he only had 1/4th of the closet. At least our motor home had a slide-out, which expanded our living space by 41 square feet — give or take a few inches ... and every square inch counts! Living here at the Sebastian Airport was quite peaceful and handy. Our 3 Shelties had plenty of space to run



Sue and Lynn happy to be flying!

and play Frisbee. Living 20 minutes from the Atlantic Ocean was definitely a plus. Those of us from the Midwest (for us Nebraska) don't witness anything quite as magnificent as the expanse and wonder of the ocean.

When Lynn started talking about me helping him build a Velocity (a pretty strange looking airplane in my opinion), I would roll my eyes and say to myself, "Right! I'm going to build an airplane – what's next, a space shuttle?" But one wife said it was like a big craft project! So that made sense to me, doing just a little bit at a time. So I put on my plastic gloves and mixed resin, cut fiberglass, measured cloth, drilled holes, cut out foam with the band saw, helped design and decide on seats and the interior (that was the most fun) and sanded. It was actually kind of fun, and my husband was elated that I would actually participate in "his" project. Although I had a very minor part in the actual building of this airplane, it helped me to be a part of it.

To see Lynn actually fly this airplane now makes it all worthwhile. His hard work and accomplishments has resulted in a beautiful airplane. When I have my first flight in it, I know that I will say, "I can't believe I helped build this!" Alas, this turned out to be an exciting adventure and a good experience. We met wonderful people and established lasting friendships, ones we obviously would have missed had we not been here.

There's only one thing that concerns me – what will he want to do next year?!!

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Safety Corner

Accident & Incident Reports,
Maintenance & Service Difficulties

Don't Forget To Let Us Know

If you have a problem with your airplane or any of the systems in your airplane, especially those of you who are flying, we would appreciate contacting us here as soon as possible so we can find a solution and let all our other builders/flyers know what's going on. We have had various calls in the past where the caller would indicate something he had read on the "reflector" or heard from other builders, that needed attention by the factory. Problem is, we are not aware of what it might have been that needed this attention. If you see something that is critical for safe flight, let us know ASAP so we can look into it and determine if we need to issue an "AD" note or a simple warning or whatever.

Service Warning IO 540 Exhaust

We just found out that we have had two more exhaust break off on the 540's. One had the finger patch welded in place and we understand that the exhaust broke just beyond the finger patch. Fortunately the safety strap held and no prop or engine compartment damage was noted. In the other case, the finger reinforcement was not installed and when the exhaust broke, a major part departed the airplane and went through one of those expensive M-T prop blades. If you are flying your XL, it is vitally important that this area of the exhaust be inspected on a regular basis. It is also vitally important that the retaining safety straps be installed and checked on a regular basis. In the past, we have used safety wire for this safety strap. It is

now apparent that you should use some 1/16" steel cable and connect both ends using the nicopress sleeves. Several of our builders have placed a stainless steel hose clamp around the exhaust just inside the cowling and ran the 1/16" steel cable from this clamp to an Adel clamp attached to the engine mount. Not at all a bad idea.

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Flight Check! Be Safe!

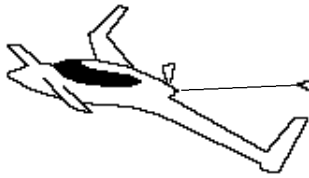
Velocity Service Center Inc. offers flight training for builders/pilots to safely learn how to transition into flying a Velocity. Get a **Flight Check Out** prior to your first flight! Flight training is available from:

- Nathan Rigaud, CFII
- Brendan O'Riordan, CFII
- Scott Baker, CFII

The following instructors have also been approved by Avemco Insurance:

- Sam DaSilva
- Mike Gunvordahl
- Mack Murphrry

Don't take a chance, get checked out prior to your first flight. Please note that you should be current in some other type of aircraft prior to your Velocity check out. The purpose of the "flight check" program is to transition you from flying other aircraft types (like a Cessna) to a canard pusher (Velocity).



FACTORY NEWS

by Duane Swing

Insurance Issues

We are now into our 9th month of working with the insurance companies on the compromise inspection/training program. I say compromise because of the flight hours the insurance companies would like to see in your log book before insurance is issued. I had pleaded with the executive VP of Avemco to wave the total flight time requirement if the pilot went through our training program and his airplane could be inspected prior to flight. Avemco agreed to accept, on a trial basis, my suggestions on a reduction in total flight time if the above conditions were met. A recent article in AOPA puts this into a more meaningful comparison. Here is what most insurance companies want when comparing other general aviation airplanes to the Velocity:

A) Fixed gear (high performance) – private pilot license with 300 hours total time with a CFI checkout. Some insurance companies also will require an instrument rating. For the Velocity SUV and the Standard FG, Avemco has agreed on 100 hours total pilot time and a factory check-out.

B) Retract gear (201 hp or less, complex) – private pilot license with 500 hours total time, 100 hours retract time, instrument rating and a CFI checkout. There may also be the requirement of 25 hours in type. For the Velocity Standard RG, Avemco has agreed on 150 hours total time with a complex log book endorsement and a factory check-out.

C) Retract gear (over 201 hp, complex) – private pilot license with 750 hours total time, instrument license, complex endorsement, 250 retract hours and 25 hours in type. For the

Velocity XL RG, Avemco has agreed on 200 hours total pilot time and a factory check-out.

As you can see, the Velocity pilots are getting a fair shake from Avemco even though many of you have given me fits for even suggesting a minimum flight time requirement. Many of you were against any factory sponsored inspection program and some were also critical of the need for a check-out. Although it is too soon to see what the final outcome will be, it is interesting to compare the 9 months prior to this program to the last 9 months when this program was in effect. According to Avemco, they paid out over \$350,000 in claims during the final 9 month period prior to stopping Velocity insurance and no claims were reported during the last 9 months. If this trend continues, Avemco has agreed to look at a reduction in insurance premiums down the road.

Brazilian Wings

We received the assistance of a retired NACA engineer in the redesign of the Brazilian winglets and have completed the building and testing of these new wings. The airplane is in the final stages of completion and flight testing will be completed in about a month. Those of you who are waiting for the new wings, be patient, we are almost there.

Supercharged Velocity XL RG

The supercharged XL is now flying and we continue to accumulate data on this installation. So far, the airplane has been up to 15,000 feet and we still can get 100% power at this altitude. The automatic controller is not working and all the

power management must be done using manifold pressure and PSI boost to determine power. One of the major drawbacks to this installation is that the supercharger is running all the time and consumes about 25 to 30 horsepower from the engine just to run the supercharger even though all the pressure is being dumped overboard so as not to damage the engine. This has resulted in about a 25% reduction in climb performance at sea level. There are a couple of ways to eliminate this problem. One is to boost the engine at takeoff to compensate for this loss in power. This could be accomplished using perhaps 32" manifold pressure for take-off and climb instead of the customary 29". The other way would be to use an electric clutch like the air conditioner in your car to engage the supercharger when manifold pressure drops to the level where 100% power is no longer available. This would also require an automatic manifold limiter to prevent engine over-boost. All these options are under consideration and if any of you have experience in this type of thing, let me know your thoughts.

Brakes

We continue to test two different brakes on the Velocity. We have tried the Grove double puck system with varied results. Certainly the braking power is greater than the 600 Matco's most of you have with your kit. The down side has been a persistent chattering at speed of about 30 to 40 knots. Grove has indicated a willingness to solve the problem, so we wait.

The new compound Matco have also been installed on our XL and is now presently flying with these brakes. These are the brakes that are mostly internal within the wheels and accumulate heat that is transferred to the gear legs through the aluminum axle. We solved this problem by installing a 1/4" X 6" round phonelic spacer between the gear leg and the aluminum axle. The jury is still out as to how much better they may be when compared to the 600's.

Factory News

Continued from previous page

We will continue testing and report our results.

And now a third option. One of our builders, Lynn Gallup, has been having a tough time making his Matco 600 series work properly. Soft brake with not enough power to stop the airplane. After talking to Scott Swing, Lynn made some adjustments but was still unable to get a good brake. Lynn is quite persistent and made a call to Matco. What they told him was that the new owner of Matco was aware of the problem and had come out with a fix for all the older 600 series brakes. The replacement parts cost \$255 for both sides and Matco will allow a core return of the old parts of \$66. This makes the total, with the return rebate, of \$224 plus any shipping cost. Lynn has brand new brakes and I am not sure if the rebate would apply for older used parts. After Lynn tried the new replacement parts, he reported a 100% improvement in the brake action. If your having trouble with your old Matco 600 brakes, you might give them a call and see what they will do. The part number of the replacement parts is #CNVB-600XT-1. Matco's phone number is 801-486-7574.

Matco told us that they will continue to sell the old 600 series along with the new XT models. We will convert our 600 to the new XT models and test them. If they are, indeed, superior to the older 600's, we will make them as standard equipment in the future. Don't call us for replacement parts as this will be handled direct by Matco.

West Coast Fly-In September 2 and 3rd

For those of you out West, or Easterners who want to get away for a few days, don't forget to **sign up** for our California Wine Country fly-in. This will be held on September 2 and 3rd. It is important you let us know if you are going to be there so proper lodging and food can be pro-

vided. One of the planned activities is a wine country tour. Bonnie and I are planning to be there along with Nathan, Brendan and Scott Baker, so we hope to see you in September.

West Coast Training

This is a further reminder to you West coast people that we will have flight training available in Sacramento on September 4 and 5 following the Wine Country fly-in. If you're getting ready to fly your airplane, you will want to take advantage of this training session. Call Brendan or Nathan to schedule your time.

Factory Authorized Insurance Inspectors and CFI's for Checkouts.

We have been working with some of the Velocity builders and have qualified several for the purpose of the insurance inspection. Please look over the list and contact the one nearest you if you are ready for this inspection. The fee is a flat \$400 plus any out of pocket expenses the inspector might have. Remember, this is an inspection only. It is the responsibility of the builder to make any changes/repairs necessary to meet the insurance requirements. If the inspector has the time, he may want to help you with these changes but it is not his responsibility to do so. The inspection outline is available for the asking. Velocity Factory – Sebastian FL, tel. 561-589-0309

The following are flight instructors who have been approved by Avemco for the **factory checkout**. It is important that you tell Avemco that you have received the EAA Flight Advisory Counsel as part of this checkout.

Brendan O'Riordan – Velocity Inc.
561-568-0309
Nathan Rigaud – Velocity Inc.
561-589-0309
Sam DaSilva – Seminole FL
727-595-6384
Mike Gunvordahl – Burke SD
605-775-2952
Mack Murphrry – Dayton NV
775-246-9364

Sam, Mike and Mack would be available to instruct customers who purchased a Velocity that already had the flight restrictions flown off. Contact them directly if you are looking for someone to conduct a first flight.

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Please Take Notice:
**The August
Factory Open House**
has been **cancelled** due to
conflicting schedule.
The next open house will be
held on November 3rd.
Thanks!

Factory Authorized Insurance Inspectors

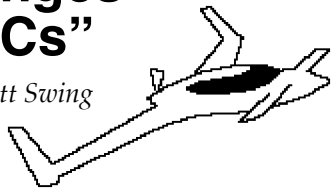
Please make note of these individuals:

Name, Home Phone / Work Phone

Barry Gibbons – Colorado Springs CO 719-683-8659 / 719-572-8627
Don Pearsall – Owasso OK 918-272-5551 / 918-474-2610
Mike Pollock – Sachse TX 972-530-8400 / 972-728-2725
Glenn Babcock – Tampa FL 813-677-2543 / 813-604-2637
Brian Galleger – Fallbrook CA 909-461-9990 / 909-696-0160
Wes Rose – Grand Rapids MI 616-772-7235 / 616-530-0255
Jean Prudhomme – Boca Raton FL 954-559-4988
Mack Murphrry – Dayton NV 775-246-9364

Kit Plans Changes "KPCs"

by Scott Swing



Note: Check the date at the bottom of your page. If it matches the "Date of Change" shown in the KPC, your manual has already been corrected.

KPC 142

Affects all RG aircraft
Manual Section 9.6.1
Date of Change 6-4-01

Change the dimension for drilling the #21 hole in the swingarm from 2.125 to 2.1875. This lessens the amount of travel for the nose gear doors so that everything fits more easily.

KPC 143

Affects all Aircraft with Molded gear box structures. This is in place of the 6 ply Triax between the gear bulkhead and firewall under the spar. Manual Section 5.3.1 to 5.3.3
Date of Change 6-4-01

The Ducts, engine bulkhead, gear bulkhead and gear boxes, (replaces the 6 triax lay-up shown in chapter 8 of the fixed gear manual and chapter 9 of the RG manual) all need to be fit at the same time. There are some locating dimples in the fuselage and engine bulkhead to locate it.

The engine bulkhead has three dimples in it that match three in the fuselage. Drill those out to 1/8" and cleco the firewall into position. Level the fuselage using the firewall as a guide and put the canard bulkhead into position. The keel and ducts can be inserted at this time to keep everything lined up. Cleco the canard bulkhead into position as well as the ducts.

When everything looks right, Sand all flanges and fuselage mating surfaces and bond in the canard bulkhead and ducts. Use rivets or clecos

to hold these down while they cure. At the back where there is not foam, you will have to use clecos.

The box structure has two holes front and back. Drill those out to 1/2" or so they are allowed to float between the gear and engine bulkheads. Sand the flanges of the engine and gear bulkheads as well as the front and back surfaces of the box and the surfaces of the fuselage they will be mating against. Trial fit these four parts into the fuselage and you can use a couple of long 1/4" threaded rods to connect them. When satisfied with everything, take them apart, apply glue to the front and rear surfaces of the box and put the four parts back together on the bench before you insert the whole thing into the fuselage. Glue the flanges and outboard sides of the boxes or anything that will contact the fuselage. Put back into position and cleco the engine bulkhead for alignment. Adjust the boxes and the gear bulkhead to get the boxes and threaded rods as level as possible then tighten the rods. To hold everything into position, we drill and rivet the engine and gear bulkheads to the box so they won't move while they cure.

Note, any flanged surface does not need to be glassed over. Only the non-flanged side of engine, gear and canard bulkheads need to be glassed. This assumes that the flange has not been trimmed down.

KPC 144

Affects all planes with the molded box structure (6 triax lay-up between the gear and engine bulkheads)
Manual Section 8.1.2
Date of Change 6-4-01

Add:

Bond the bottom of the spar to the pre-molded boxes as well as the outboard 3 inches of the engine bulkhead. It is not necessary to bond the back side of the spar to the engine bulkhead but it would be best to do so.

Reason: Obviously before the boxes, you glassed the 6 Triax pieces under the spar to glue it in. When the boxes

are already done, you need to glue them down.

KPC 145

Affects all planes with the new ball bearing seat sliders.
Manual Section 10.2.3
Date of Change 6-4-01

The forward front seat hard points are centered 35" aft of the canard bulkhead.

The distance off the centerline for the standard fuselage is 6.75" and 14.25"; XL is 7.5" and 15".

The rear front seat hard points are centered 45" aft of the canard bulkhead.

The distance off the centerline for the standard fuselage is 6.25" and 13.75"; XL is 7" and 14.

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by Scott Swing

New method for speed brake installation:

I found it easier to cut the speed brake out, do the hinging, clean up the gap around the speed brake, do the edge foam glassing, then with a slightly larger first piece of Triax, cover the hole as well as the hinge location. This makes it easier to do the hinging. When glassing over the hole with the Triax, I duct tape the speed brake then use one washer under the hinge at the fuselage to raise the speed brake a little then set the rear of the speed brake up the same amount then glass it. When you remove the washers it lowers the speed brake back and gives you space.

Different way of installing the fixed nose gear

Last time I installed the nose

Builder Hints

Continued from previous page

gear I mounted the two aluminum angles to the thick captivator (the one with the grove for the gear) before I mounted the whole assembly. First I preload the shock a little by setting the nose gear down onto the concrete and letting the weight of the plane on it. Then, using clamps, I set the angles and the captivator in the hole. One at a time I attach the angles to the captivator. I then pre-drill the side holes in the angles, put the assembly down into position, and, using a right angle drill, start the holes into the keel. I then remove the assembly and finish drilling the hole. Slide a bolt through to hold it and continue on. This method allows you to control the holes that go into the assembly from the keel.

Hydraulic pump adjustments

We have had the same thing happen with the pumps as we had back in newsletter Volume 20. Please check your pump before you put fluid in them since it is easy to do. Again, the measurement from the machined area of the adjusting shaft to the jam nut should be about 9/32". This is the post that is under the side of the pumped marked DN by the outlet. This is our side of the pump that brings the gear up. Any questions please call or E-mail.

Also, check your pressure switches to ensure they are plumbed and wired to the proper side. Some of the switches are not marked by pressure numbers and only have a part number. According to Wayne Lanza, he may have switched those that were not labeled with the pressures. If you check yours and you do not have the pressure listed, the high pressure switch (plumbed to the side marked DN) should be 692004 (1050 psi) the low pressure switch is 661604 (550 psi). Since those are blade connectors, it is easy to switch the switches if you need to.

Strake leading edge voids

Check your fuel strakes as we have some with voids about 4" up from the edge. This is fixable by injecting the void with epoxy and a little micro. You can remove the primer in this area to visually check your progress. Starting from the middle, drill some 1/8" holes and plug with rivets as you go. This is not a delamination, it is a void created in the molding process. Do not inject too hard or you will make a bulge in the surface. Be patient. Any problems let us know.

Nose gear safety hole

Don't forget to add a hole in the side of your keel to access or confirm that the nose gear is down and locked in case of an electrical failure. This hole is positioned just below the linkage near the shock and can extend through the other side of the keel to allow a wood dowel to check that the gear is locked then extend across to remain until safe landing.

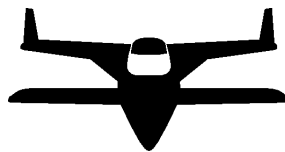
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We need your input for this newsletter to be a success!

- Builder Forum Input
- First Flight Photos
- First Flight Stories
- Velocity Flying Adventures
- Velocity Fly-in Suggestions

Send your photos / stories to Rick Lavoie for the next newsletter!

**26 Marshview Drive
St. Augustine FL 32080
USA**



November 3rd Factory Open House Workshop Schedule

Saturday November 3, 2001 - Factory's quarterly open house in Sebastian Florida (X26)

9:00am	Coffee and donuts
10:00am	Workshop: TBA
Noon	Lunch
1:00pm	Workshop: Building Q&A
3:00pm	Demo rides in the XL

Please be sure to call the factory and RSVP! Friday arrivals can book a room at the Key West Inn at Captain Hiram's here in Sebastian. Call 800-833-0555 and mention Velocity to get a corporate rate. When you call the factory to RSVP, let us know when you plan on arriving so we can make arrangements for transportation, etc.

Check velocityaircraft.com for up-to-date details

Production News

by Scott Baker



Parts is Parts ...

"Hello? I'd like to order a replacement bearing thing for the front of my Velocity ...". As more and more Velocity aircraft near completion and take to the air, our Parts Department is seeing an increase in the ordering of optional and replacement parts. Velocity, Inc. has for years specialized in the sending of entire kits, and I must confess – managing the recognition, inventory control and shipping of single parts has become quite a challenge. The situation is made difficult for a number of reasons, but perhaps the biggest is the lack of unique part numbers for many Velocity parts and the fact that we have many names that sound the same, but apply to different aircraft. For example, the door strut that fits today's Standard (gull wing) model doesn't come close to matching the Standard (top door) sold in 1985. You can imagine the confusion this causes without reference to a part number or at least a full description of the aircraft model.

As we work to become better organized, please help us to improve our service to you. Whenever possible, please mention the following when ordering parts:

- A) Model of aircraft (be sure to mention if you have a top door model)
- B) State if the aircraft is a fixed or retract gear model
- C) If the part is engine related, be sure to mention the make and size of the engine, including the horsepower. Many Velocity parts are not interchangeable. For example: the cooling plenum for the IO-540 260hp is dif-

ferent from the IO-540 300hp. Also, please mention if the engine cooling system features the new "top down" NACA duct design or the "arm pit" scoop design.

D) If you've done something out of the ordinary to the design of the aircraft, please make mention of it.

Example: you might have a SUV with an oversize nose wheel assembly – or installed the high performance Matco "Compound" brake.

E) And lastly, when describing the part, please – whenever possible – reference the part number. The Construction Manual may give some clues in this area.

"Hello? I'd like to order a replacement Front Aileron Torque Bearing, Velocity part number VFAB-01. I have an Elite Standard RG aircraft". Now, that's better!

General News

Fastbuild Wings and Super-Fastbuild Fuselages continue to be popular sub-assembly options. This year, about 1 in 2 Velocity buyers have select one (or both) of these time and labor saving options. Our in-house Fastbuild Wings department is producing 4 sets of wings per month – which has allowed us to "chip away" at the Fastbuild Wing backlog. A special thank you goes out to all of those who are in line to receive Fastbuild wings; your patience is greatly appreciated!

Velocity becomes OEM dealer for Continental Motors

For years the good folks at Continental Motors (a Teledyne Technologies Company) have been courting Velocity, Inc. with the prospects of introducing their line of power plants into Velocity aircraft. In March, Velocity, Inc. officially became an OEM dealer of factory new Continental aircraft engines. To get the relationship off to a flying start, Velocity, Inc. has selected the TCM IO-550N engine as the power plant for its new XL-RG factory

demonstrator, which is under construction and expected to be ready for flight-testing later this fall.

The IO-550N is also the power plant for the Cirrus SR22 and the Lancair Columbia 300. It is rated at 310-horse power at 2700 rpm and has a recommended TBO of 1700 hours. The size and weight of the engine is comparable to the Lycoming IO-540 and looks to fit nicely into the Velocity XL.

Velocity plans to offer a "firewall aft" engine package featuring the normally aspirated IO-550N in combination with a hydraulic governed, 3-blade propeller from MT-Propeller (details and pricing to be announced later).

Our present focus with Continental centers on the engine for the XL model. Later we hope to look at the Continental IO-360ES (210-horse power) engine for installation in the Standard and SUV models. Velocity, Inc. is introducing the IO-550N model at a selling price of \$34,872 – which includes Continental's Premium 3-Year Warranty on Parts and Labor. The engine comes with 12V starter, magnetos, ignition leads, spark plugs, fuel metering system, a 12 volt-70amp alternator, oil filter and oil cooler.

MT-Propellers Become FAA Certified on Velocity Aircraft

MT-Propeller recently completed an extensive series of stress tests and analysis of MT propeller installations on the various Velocity aircraft models based at the Velocity Service Center. The good news following the tests is that MT-Propeller has increased the recommended TBO to 1,800 hours, and they have formally certified their propellers with the FAA for installations featuring Velocity aircraft and selected Lycoming engines (see list). This means that certified MT propellers, when combined with an approved power plant, should allow inspectors to authorize the less restrictive 25 hour Phase I fly-off restriction

Continued on next page

Production News

Continued from previous page

instead of the 40 hours for aircraft with “experimental” propellers and engines.

Velocity / MT-Propeller Certification List

MTV-9-() Velocity XL Lycoming IO-540:

C1- Series N1- Series
C4- Series R1- Series
J4- Series D4- Series
W1-Series T4- Series
W3- Series V4- Series
AEIO-540-D1 Series

MTV-18-() Velocity Elite Lycoming IO-360 & Velocity Std:

A1B6 B2F6
A1B6D C1C6
A1D6D C1D6
A3B6D C1E6
A3D6D C1E6D
B1F6 J1A6D
LIO-360-C1E6
AEIO-360-
A1B6 B1G6
A1E6 B2F6
B1F6

MTV-7-() Velocity SUV Lycoming (L)IO-320

A- Series
B- Series
C- Series
D- Series
E- Series

A special note to SUV applications featuring the MTV-7 propeller and Lycoming IO-320 engine – The following limitation has been established: “The RPM range below 2200RPM and above 2650RPM must not be used for continuous operation. Take off and initial climb may be performed with up to 2700RPM”.

Velocity Becomes Dealer for Catto Propeller

Velocity, Inc. has recently become a dealer for Catto Props, a manufacturer of wood, fixed-pitch

propellers featuring a unique hub (see their web site at www.catto-props.com). We recently spoke with a Velocity owner operating a Catto propeller who reports being very pleased with the performance and quality of the Catto prop. Catto uses a sophisticated software program to design the propeller to give optimum performance. We hope to have Craig Catto speak at the West Coast Velocity Fly-In this September. Please call us for the very best pricing on Catto props.

Photo Contest

How many times has it been said, “Wouldn’t it be a great idea to have more photographs of Velocity aircraft interiors, paint schemes, instrument panels, (fill in the blank)?” We at Velocity agree! You already have photos of factory aircraft – but how about the 200 or so Velocity aircraft that are flying worldwide? Last quarter, the Velocity Views introduced a Photo Contest to help stimulate the cascade of photographs that were sure to pour in - and to date we’ve received...ahhh, none. Certainly you’ve got some favorite Velocity pictures to share! Needless to say, this effort is going “bust” without your help! Please reference Views Volume 26 for contest details and be sure to take that camera on the next trip to the airport!

Sun ‘N Fun 2001 Recap

The weather was “The best we’ve seen in years!” and the crowds were ...where were the crowds? Despite the absolutely beautiful weather, attendance was markedly down at this years EAA Sun ‘N Fun event, which was held at Lakeland Airport, Florida. Velocity, Inc. featured the SUV and several XL model aircraft in the manufacturers display area. Many, many thanks go to Wes Rose, Jean Prudhomme, and Marty Horowitz for displaying their beautifully built XL-RG aircraft. All three received outstanding comments and reviews!

Brendan O’Riordan and Nathan Rigaud conducted demonstration rides out of Winter Haven Airport, located about 15 miles from Lakeland and away from the “bee-hive” of aircraft activity surrounding Sun ‘N Fun.

About 140 Velocity pilots, builders and fans attended the Velocity Dinner, which was held at the Imperial Lakes Country Club. Jim Guitteau from UPS Aviation Technologies was the featured speaker. Jim enlightened the audience with the latest on GPS, moving map, and data link technology that is available to general aviation.

Frederic Villard honored Velocity, Inc. with the presentation of a copy of *Experimental*, a French magazine publication highlighting amateur aircraft construction in Europe. The magazine featured a 14-page write-up on Velocity and a history detailing the building and flying of Villard’s Velocity Standard RG. Congratulations to Frederic Villard for his work in completing his Velocity and working with *Experimental* to develop such a nice article.

9700B or not to “B”

Recently a writer to the “Reflector” Internet Velocity Builders Forum mentioned that Jeffco had introduced a slow hardener for the Jeffco 9700 Epoxy sealant. Velocity Purchasing Agent, Paul Baribault contacted the technical folks at Jeffco – and reports that they had, indeed, been working a slow hardener and that it is now available. The present hardener (9700 part B) has about 25 minutes of pot life, where the new one (3191) is around 60 minutes. This should allow the additional time needed for connecting the top strake while providing the same fuel resistance as the present mix.

As a result, we will soon be supplying 9700 part “A” epoxy with “3191” hardener in our kits. Thanks for the help and keep that information coming!

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A&P Talk

by Brendan O'Riordan, CFII, A&P



Maintaining your own aircraft

One of the benefits of building your own airplane is that you can apply for a Repairman Certificate, which will allow you to perform your own maintenance on your airplane. According to FAR 65.104 to be eligible for a Repairman certificate you must be 18 years old, primary builder of the experimental airplane, be a citizen of the United States or legal resident, and show to the satisfaction of the administrator that you can determine if the aircraft is in a condition for safe flight. Now that we can legally maintain our own airplane we are responsible for keeping that airplane in a condition for safe flight. So how do we do this?

First off we can check out Advisory Circular 65-23A. This advisory circular deal with certification of repairmen and also gives some guidance as to what is required of the repairmen maintaining his own aircraft. In this AC it tells us that a repairman can perform "Condition Inspections". Now for our experimental airplane to remain legal we must perform a condition inspection on our aircraft annually and follow the scope and detail of FAR part 43 Appendix D. There are two lists that can be used to make sure your inspection is done to FAR 43 standards. In Advisory circular 90-89A there is a sample checklist that is not aircraft specific that will walk a per-

son through a condition inspection. Another source that would be better for Velocity owners is a copy of "Velocities Insurance Inspection Checklist." This was written to cover everything needed in FAR 43 Appendix D as well as specific details that pertain to Velocities only. Once your Condition Inspection is complete you will need to make sure you put an entry into your logbook. The wording the FAA would like to see is found in AC65-23A "I certify that this aircraft has been inspected on (insert date) in accordance with the scope and detail of FAR43, Appendix D, and found to be in a condition for safe operation." This entry also needs to include the aircraft total time in service, the name, signature, and certificate type and number of the person performing the inspection.

There are many different sources available to give the builder an idea of how to keep his airplane in a condition for safe flight. Two of the most basic sources are the Velocity Builders Manual and AC 43.13.1b-2b. Hopefully referencing the builders' manual seems like common sense to all of you. AC 41.13 is the advisory circular that is written to show acceptable methods, techniques and practices for maintaining aircraft. This book shows you how to perform basic tasks such as safety wiring, bolt torques and basic electrical wiring. This book is by far what most A&P mechanics would refer to as their "Bible" when it comes to working on airplanes. All experimental aircraft owners who are thinking of doing there own maintenance should have read through both of these sources and should have copies on hand at all times while performing maintenance.

There are a few other items that a repairmen should keep up with in order to establish a good "Maintenance History" for his airplane. First off all maintenance performed on the airplane should be recorded in the appropriate logbook. It is very common for an airplane that is a few years old to come into

our shop for general maintenance and the only entries in there log book are there initial sign off by their DAR, their sign off for phase 2 of their operating limitations and the couple of Condition Inspections that they have performed. It is impossible to tell if this airplane has been maintained at all or to what standards it has been maintained to without records. When you do put a maintenance entry in your logbook put in the date, time in service on the airplane and sign your name and certificate number. One other thing that should be mentioned is that you should have a separate logbook for your Airframe, Engine, and Propeller if it is a constant speed or in flight adjustable. This makes it easy and quick to research your maintenance history. If, for example, you are having a problem with the compression on a certain cylinder you do not want to have to sift through listing of tire changes and propeller maintenance in order to find your last compression check.

The privilege to be able to do your own maintenance comes with some responsibilities and as Repairmen or A&P mechanics we need to make sure we live up to these responsibilities in order to preserve safe flying aircraft.

An internet link to get the above mentioned Advisory Circulars:
<http://av-info.faa.gov/dst/amateur/>

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Maintenance Notes

by Michael J. Snyder
Private Pilot, A&P, IA



Annual / Condition Inspections

When doing a Condition Inspection usually the first thing to look at is the paper work. First we will start with the paperwork that is required to be in the aircraft while in operation. Your Airworthiness Certificate and your Registration must be displayed in the cabin area. Weight and Balance and Operating Limitations must also be on board.

Next paper work to be dealt with is the maintenance records. This gives the history of what has and has not been done to the aircraft. One area we need to keep track of is Airworthiness Directive (AD) compliance. The FAA requires a compliance report to show the status of required AD notes, tach time on the aircraft, method of compliance and on a recurring AD the tach time or date the next inspection is due. Many experimental aviation groups believe that AD compliance is not required. Here at Velocity it is our Company policy that all inspections done here will require AD compliance. Most insurance companies will require AD compliance or your coverage is Null and Void. This is a quote from a current AD issued to Lycoming engines for the changing of the oil pump

gears " This AD applies to each engine identified in the preceding applicability provision, regardless of whether it has been modified, altered or repaired in the area subject to the requirements of this AD." This tells me that this AD needs to be complied with even on our altered "Experimental" engines. Besides it just makes common sense that an owner would comply just for safety reasons.

Many log books that we see here at our Service Center have the required Condition Inspection Sign off " I certify that this aircraft has been inspected in accordance with FAR part 43 appendix D and found to be in a condition for safe operation." This is all that is required but it is also a good idea to include all work that is done i.e. tire changes, gear retractions.etc. This gives you a maintenance history for future reference. As far as the inspection goes I will give you a copy of FAR part 43 Appendix D at the end of this article so you have a guide as to what is required.

Once again if you do not have it I strongly recommend you obtain a copy of AC 43.13-1b-2b. This will give you the information needed for inspecting and maintaining your aircraft. There is no excuse for not being able to find a copy. Copies can be obtained from aircraft parts suppliers such as Aircraft Spruce and Specialty.

Appendix D to Part 43- Scope and Detail of Items (As Applicable to the Particular Aircraft) To Be Included In Annual and 100-Hour Inspections

(a) Each person performing an annual or 100-hour inspection shall, before that inspection, remove or open all necessary inspection plates, access doors fairing, and cowling. He shall thoroughly clean the aircraft and aircraft engine.

(b) Each person performing an annual or 100-hour inspection shall inspect (where applicable) the following components of the fuselage and hull group.

Federal Aviation Regulations

(1) Fabric and skin - for deterioration distortion other evidence of failure, and defective or insecure attachment of fittings.

(2) Systems and components - for improper installation, apparent defects and unsatisfactory operation.

(3) Envelope, gas bags, ballast tanks, and related parts - for poor condition

(c) Each person performing an annual or 100-hours inspection shall inspect (where applicable) the following components of the cabin and cockpit group:

(1) Generally - for uncleanliness and loose equipment that might foul the controls.

(2) Seats and safety belts - for poor condition and apparent defects.

(3) Windows and windshields - for deterioration and breakage.

(4) Instruments - for poor conditions, mounting, marking, and (where practicable) improper operation.

(5) Flight and engine controls - improper installation and improper operation.

(6) Batteries - for improper installation and improper charge.

(7) All systems - for improper installation, poor general condition, apparent and obvious defects, and insecurity of attachment.

(c) Each person performing an annual or 100 - hour inspection shall inspect (where applicable) components of the engine and nacelle group as follows:

(1) Engine section - for visual evidence of excessive oil, fuel, or hydraulic leaks, and sources of such leaks

(2) Studs and nuts - for improper torquing and obvious defects.

(3) Internal engine - for cylinder compression and for metal particles or foreign matter on screens and sump drain plugs. If there is weak cylinder compression, for improper internal condition and improper internal tolerances.

(4) Engine mount-for cracks, looseness of mounting, and looseness of engine to mount.

Continued on next page

Maintenance Notes

Continued from previous page

(5) Flexible vibration dampeners - for poor conditions and deterioration.

(6) Engine controls - for defects, improper travel, and improper safetying.

(7) Lines, hoses, and clamps - for leaks, improper condition and looseness.

(8) Exhaust stacks - for cracks, defects, and improper attachment.

(9) Accessories - for improper installation, poor general condition, defects, and insecure attachment.

(10) All systems - for improper installation, poor general condition, defects, and insecure attachment.

(11) Cowling - for cracks, and defects.

(d) Each person performing an annual or 100-hour inspection shall inspect (where applicable) the following components of the landing gear group:

(1) All units - for poor condition and insecurity of attachment.

(2) Shock absorbing devices - for improper oleo fluid level.

(3) Linkages, Trusses, and members - for undue or excessive wear fatigue, and distortion.

(4) Retracting and locking mechanism - for improper operation.

(5) Hydraulic lines - for leakage.

(6) Electrical system - for chafing and improper operation of switches.

(7) Wheels - for cracks, defects, and condition of bearings.

(8) Tires - for wear and cuts.

(9) Brakes - for improper adjustment.

(10) Floats and skis - for insecure attachment and obvious or apparent defects

(e) Each person performing an annual or 100 - hour inspection shall inspect (where applicable) all components of the wing and center section assembly for poor general condition, fabric or skin deterioration, distortion, evidence of failure, and insecurity of attachment.

(f) Each person performing an annual or 100-hour inspection shall inspect (where applicable) all components of the wing and center section assembly

for poor general condition, fabric or skin deterioration, distortion, evidence of failure, and insecurity of attachment.

(g) Each person performing an annual or 100-hour inspection shall inspect (where applicable) the following components of the propeller group:

(1) Propeller assembly - for cracks, nicks, binds, and oil leakage.

(2) Bolts - for improper torquing and lack of safetying.

(3) Anti-icing devices - for improper operations and obvious defects.

(4) Control mechanisms - for improper operation, insecure mounting, and restricted travel.

(h) Each person performing an annual or 100-hour inspection shall inspect (where applicable) the following components of the radio group:

(1) Radio and electronic equipment - for improper routing, insecure mounting, and obvious defects.

(2) Wiring and conduits - for improper routing, insecure mounting, and obvious defects.

(3) Bonding and shielding - for improper installation and poor condition.

(4) Antenna including trailing antenna - for poor condition, insecure mounting, and improper operation.

(i) Each person performing an annual or 100-hour inspection shall inspect (where applicable) each installed miscellaneous item that is not otherwise covered by this listing for improper installation and improper operation.

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Electric Buzz...

by Wayne Lanza



Today's topic is the old adage - "He who dies with most toys, WINS!" I now direct my ramblings towards the most useful and coveted thing in our whole being, yes I mean the instrument panel! If money is no object then the following is meaningless but here's a few things that we've seen that can really kick you hard in the wallet.

Everyone wants the newest and greatest stuff in his aircraft; invariably we can and will rationalize a good reason to install that 'Series 100000 Framilizer with inverse linear coupling and the latest in LED technology' because it has really neat blinking lights.

OK, what's my point? Do we need 3 - 4 displays in the panel? If you've got the bucks and the need, perhaps dual Sierras and dual 530's makes perfect sense. Other wise a UPS stack with an MX20 and gyros will do the trick for about 1/3 the cost...

Individual engine instruments may also be a wise choice, considering that if one goes out the rest stay lit, and they will probably be easier to service, wire and pay for. Your cost for a full up, all in one engine display will run any where from \$3k to almost \$4k. Add to this about another \$1k or so for wiring (labor) and you've got yourself a nice five

thousand dollar engine gauge! Say Sparky, anybody in there?

I do not mean to recommend or discourage the use of any mentioned or implied products, just to put things into perspective. The technology available in GA today was not imagined 10 years ago, and is cheap compared to the past. But the complexity of our new-found toys is also way out there. How much do we really need, can we really use, and can we really afford to install and maintain? As the sophistication and reliability of our flight systems advances so does our safety and capability. But as pilots we still need to be able to fly, if necessary, by our wits and skill if every thing should just crap out.

We have installed instrument panels that weigh 40-80 pounds, at a cost of any where from \$1k to \$1.5k per pound! They look great but tend to make you look for a slot to drop in the quarters... A lot of guys are going somewhat basic and allowing for future panel additions. This is a good strategy especially if you work within a budget, it will leave a little extra for other important things like the engine, prop, paint, etc... Get it flying in this life time, enjoy it and add what you really need later.

Consider your panel carefully and then get a few solid quotes from competent avionics shops for wiring and assembly. Shop labor can run any where from \$50 to \$100 per hour, be sure to get a cost break down. You will see labor only quotes ranging between \$3k - \$12K. Airframe wiring is yet another issue, you can do it your self but if you lack wiring skills, seek assistance from an experienced friend.

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Thanks!



Velocity's "California Fly-in" Are you California Bound September 2&3, 2001?

West up for Wine and Wings!

by David Karas

Imagine a perfect weekend – clear sunny CAVU skies, temperatures in the high 80s, you are relaxing with a few good friends, sipping some of the world's finest wines and talking about some of the world's finest planes. Well, mark your calendars and grab your friends, because that's what we're planning for the weekend of Sept. 2 & 3rd 2001. The West Coast Velocity Factory Fly-In will take place in the world famous Napa Valley, California.

We are planning on putting together at least one activity which will allow us to take advantage of this magnificent region (perhaps wine tasting followed by a giant Reflector mud bath?) Great shopping, sightseeing, balloon rides, wine tasting, hot springs and yes, mud baths are all close by. For those of you flying in, don't miss the spectacular VFR tour up the coast of California or the San Francisco Bay

tour taking in the Golden Gate Bridge, Alcatraz, Sausalito and Fisherman's Wharf right through and under SFO's Bravo airspace. (The tower is very accommodating.)

Speakers are already being lined up and currently include Craig Catto of Catto Propellers. The factory is planning on flying out two Velocities including the new XL fixed leg trainer. Demo rides will be available. The factory will also be hosting a barbecue and there is a rumor that hot dogs and hamburgers will be abandoned in favor of pate' and quiche! This should be a great opportunity to socialize, relax and have fun.

Stay tuned for details on hotel arrangements and location. Volunteers to help with planning and execution are appreciated. Volunteers should expect payment in the form of gratitude and the knowledge of contributing to the Velocity community. To volunteer please call or e-mail David Karas ; 925-600-9256 or karas44@home.com.

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California Fly-in Update

Since this is the last newsletter prior to this event, please get up-to-date information from the Velocity web site.

Go to: <http://velocityaircraft.com>
then click on "News and Events"

You will find the latest information on the "Calendar of Events" page.

CFI Notams

by Nathan Rigaud, CFII



The Velocity RG system is more than just putting the gear switch in the down position and hope the gear comes down. Do you really know your system and how it works?

The system that we see being used in most Velocitys is the Composite Design pre-wired systems. This is a complete system that works well. The components include a hydraulic pump assembly, main control box, gear selector panel, nose gear micro switches, main gear micro switches, throttle switch, and an airspeed switch.

The pump assembly is made up of the reservoir and pressure switches set for 550 psi for gear down, 1100 psi for gear up. 5606 red hydraulic fluid is used in this system. The main control box is the brain of the RG system.

The gear selector panel is mounted on the instrument panel and has the gear switch (up and down), green lights for gear down, amber for pump running and red for unsafe gear. This panel also has a test button and a reset button.



The nose gear and main gear micro switches takes control of the

safe, unsafe lights. Be sure these switches are adjusted correctly. We see a lot of incorrectly mounted switches.

The throttle micro switch is located near the throttle arm. This takes care of a horn that comes on at about 15 Hg of manifold pressure if the gear is not down and locked. The airspeed switch is located in the nose that works off of the pitot tube and is adjustable for a desired airspeed. This switch will not allow the gear to retract until that airspeed is present.

The main switch on the gear selector panel is the up and down switch. A good habit is to make sure the switch is in the down position before turning on the master. When the gear switch is moved to the up position, the pump will activate and the amber and red lights come on telling you the pump is running and the gear is unsafe. As the gear comes up in the wheel wells, all lights should go out. When the gear is selected down, the same happens, but the two green lights should be the only lights on when the gear is down and locked. Remember, maximum extension of the landing gear is 120 knots.

The test switch provides testing of the gear lights and horn. Do not be afraid of using this and testing your system. It is there for a reason. The Reset switch will bypass the pressure switches and allow you to directly run the pump. This allows us to put the gear down in case of a pressure switch failure.

If for some reason the gear does not come down by the hydraulic



pump, it is time to use that little red handle on the right side under the co-pilot panel, the gear hydraulic dump valve. This valve dumps hydraulic pressure from the high side to the low side and will allow the gear to free fall to the down and locked position. Once verified the gear is down and locked by seeing your green lights, pull the circuit breaker to the gear system and position the dump valve to closed position. There should be a 3/4 hole on the pilot side just below the panel that you can check with your finger to be sure the nose is over center. You can also install a rod to check this.

Since you have decided to build and fly the Velocity RG, now take some time to read the operating manual. A good habit that I recommend, at each condition inspection or any time you place the aircraft on jacks, is to make a point to run through the emergency procedures while sitting in the pilot seat. Know where to grab for the gear switch, breaker, and dump valve. You should be able to do this with you eyes closed.

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If I already have your correct information (address, etc.) in my data base, then all you need to do is mail me (Rick Lavoie) a check for \$35 (address within USA) or \$43 (address outside USA). See the last page of any newsletter for details. Please renew ASAP, but no latter than December 15th. Renewals received after December 31st will be assessed a \$5 late charge fee. Thanks...

Builders Forum

Builders Forum is full of tips, information and letters ("material") supplied to *Velocity Views* Newsletter from individuals that are Velocity builders (or want to be builders). It is provided as "USE AT YOUR OWN RISK" material. Neither Velocity Inc. (The Velocity Factory) nor *Velocity Views* Newsletter (Lavoie Graphics & Rick Lavoie) have endorsed this material, and disclaim any liability for the use of this material. Individuals who use this material for the operation, maintenance, or construction of their homebuilt aircraft do so at their own discretion and at their own risk. Any variance from the builders manual is high risk.

A STOL kit for a Velocity... well maybe.

by Rodney Brim
from Westminster, California

Let me start with a baseline. I fly an XL-RG. I am using a IO540 generating 320 hp. The wings were built by Allan Shaw's group at Wingco. After a couple of initial flights, keels were added for improved stability. I have been doing so for the past 3 years. The last plane I owned before the Velocity was a turbo 206 with a STOL kit, which the drug guys abruptly decided one day was an important item to add to their distribution channel. But that's another story.

During my adventures with the Velocity I have regularly flown out of strips at sea level and 7,000 feet. I came to have an appreciation for an increased sense of comfort in departing and landing/braking at short fields. One develops this after those certain memory imprinting departures when the fence or the trees are coming up fast... and of course you have your family members in the plane. Things like that don't happen when you are flying alone, as the Velocity poses quite a different set of flying characteristics at light weight versus heavy. In this article I wanted to share with you some of the things I have tried and failed, and tried and succeeded with in improving short field take offs and landings. By the way, my definition for a short field is 2,500 or less at sea level, usually with buildings on either end, or any altitude strip above 5,000, especially when it is warm outside.

Stopping quicker was my first

goal. You can approach that from the several different areas, but I wanted to have a healthier sense of brake under my toes. With the standard brakes I regularly felt like there wasn't enough margin in a 2,500 field to get stopped without having a case of the sweaty palms.... That fence coming up fast thing again... especially if I came in 5 knots fast. That and I had one of the pads sheer off at the rivets and lodge between the disc and the wheel when landing one time, which made for a challenging stop and a really awkward taxi. So I purposed to find better brake pads, and followed some of the reflector comments and replaced the Matco brake pads with sintered steel Rapco pads, RA66-62 and special rivets RAPB001. Yes I did check with Matco and they assured me the disc would handle the extra heat generated. This area I don't have good statistics on, but what a difference. I no longer contend with that nagging worry of "Am I going to get this plane stopped before I run out of runway?" My best guestimate is that the breaking distance has been reduced by around 15%. At a 2,500 strip it is the difference between needing the entire strip to stop, and turning off one taxi exit earlier. Very little money for a big safety margin.

Taking off quieter was the next goal I worked on. Yes I consider this a STOL phenomenon, as I have already got one sound violation in the Velocity, and here in Southern California, they get very expensive quickly. Short fields in the city mean there are homes and businesses adjacent to the airport... and sound monitors. So I started working on saving money and being a better community citizen. I have tried 5 options as listed below:

1. Initially I used the factory exhaust system (1998) and put motorcycle mufflers (the stacked disc types) on the end of the headers just outside of the cowling. It reduced sound very well, but also reduced climb rate by some 500 fpm as I was later to discover due to the disturbance in air to the prop.
2. I then reversed the factory exhaust, welded on short extensions and pointed them straight back towards the prop. They were about 6-7 inches back from the prop. I regained the lost climb, still had the benefit of some sound reduction as the prop chopped up the sound waves, but had a difficult time getting the cowling off and on... and it looked like we had put it together on the farm.
3. Option three involved having a new exhaust made up and totally contained within the cowling. It stopped within the cowling by .5 inches and approximately 5 inches from the prop. I envisioned this would add a certain evacuation effect to exiting air. It may have, but it kept smudging the prop, and after about 20 hours I noticed that the prop was starting to have numerous small blisters from the heat.
4. I still wanted to keep the exhaust hidden in the cowling, so I turned up the tips of the header so that they pointed upward at about a 45 degree angle, thinking this would push the heat away from directly impacting the prop and push the sound away from people on the ground. It may have done both, but it created a certain turbulence at the prop that kept dislodging my leading edge boots... and eventually tearing them up.
5. I gave up and reworked the exhaust to point forward as the fac-

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Builders Forum

Continued from previous page



tory system does, however I had the tubing bent to exit the cowling at a 45 degree angle, placed aluminum cover heat protection plates on the immediate cowling area and cut the pipes essentially vertical to the ground to throw the sound waves horizontally back at the prop, not the ground. I welded tabs on the pipes just before they exited the cowling and have braced them back to the engine so everything will vibrate as one. The impact on sound control is the best yet. My test group says the Velocity now has the sound imprint of a 172.

The third goal was to **take off quicker**, e.g. with a shorter ground roll. I spent time discussing options with both Duane Swing (regarding VGs) and Klaus Savier (regarding trailing edge stall fences). Ultimately through a bunch of testing, time and money I achieved over a 30% reduction in take off roll. Here are the steps I took in the process of reaching that goal:

1. I started with adding 3 trailing edge stall fences equi-distantly spaced between the outboard side of the aileron and the winglet. For a technical review of trailing edge stall fences and to view the basic shape I used, check out Klaus' website at: (<http://www.lightspeedengineering.com/KlausInfo/Flowfence.htm>) Each fence extended above the trailing edge by 3 inches, below the trailing edge by 2 inches, and aft of the trailing edge by 1 inch and faced directly into the wind. They then merged into the wing in approximately 7 inches. I only flew once in this configuration with the following

results:

- Impressive increase in rate of climb, briefly up to over 2,200 fpm with 2 large adults in front, and a very low deck angle while climbing ("Hey it doesn't feel like we are headed for the moon?"). Take off felt like we were jumping off the runway.

- Stall speed was not impacted, however roll rate was decidedly sluggish, and turning around the yaw axis was sharply diminished. The plane wanted to go straight. It made me uncomfortable enough that I didn't choose to explore much more of its flight envelope.

1. I then chopped the top .5 inch off of the existing 3 stall fences at Klaus' suggestion. That .5 inch was apparently catching a lot of wind, as I immediately had a return to normal roll rate and yaw response. I explored more of the flight envelope and noted that I had lost most of my climb improvement, with my climb rate back down to around 1,600 fpm at 100 kts when climbing from 2-4,000 feet. I started taking the stall fences off one at a time and noticed that my top end improved 3kts with each fence removed. I probably should have worked more with the angle of incidence needed to reduce the drag effect, but moved to a different placement.

2. After more conversations with Klaus, and observing the Starship, I decided to place one larger stall fence on the inboard side of each aileron. It was shaped like the previ-

ous, but extended 5 inches above the leading edge, 3 inches below and was 1 inch behind, and was again placed directly into the air stream (parallel to a line drawn from the nose to the center of the prop). I recorded an immediate improvement in the form of a 22% reduction in take-off roll. Slightly reduced yaw response and roll rate, but it actually made the plane feel like it had increased stability. I did have to do a little more rudder work to keep the ball centered when turning. No reduction in top end speed!

3. I then added a 2nd stall fence on the outboard side of the aileron, that extended 4 inches higher than the trailing edge. I only made one flight with it. The sluggish response rate around the yaw axis and to some extent the roll rate had returned, and I decided to simply remove them and enjoy the benefits of the single stall fence.

4. I still wanted to check out what the effect of the VGs might add to the equation, so went ahead and installed the factory kit. Using Duane's suggestion, I installed the VGs on the wing and the canard, but reduced the pattern center on the canard, resulting in 2 additional pairs of VGs added to each side of the canard. I recorded a number of results. First of all I reduced my timed take-off rolls another 10+%, resulting in a total reduction of over 33%! Secondly I noticed that the stall

Continued on next page



Continued from previous page

speed at dropped from 60 knots to 57, and the break was just as benign as always. My top end appeared to have dropped 2 -3 knots as well, however I need more testing to verify that. I also noticed that I was flying around with the elevator up because of the increased lift the canard was generating, which at cruise was not something I wanted. I started peeling off VGs until the elevator was less than a half inch above neutral and stopped there, with the gains still intact in the take-off role.

I still plan to check out the effects of adding VGs to the winglets. Improved rudder effect at slow speed means less need to use the brake for directional control on take-off when it is windy, which translates into the outcomes I am looking for. But I haven't got there yet, as I was involved in testing naca scoops placed in the top cowling instead of the ceiling and it didn't work and so

I have to clean up that experiment before I can get back to the rudders.

Hope the work I have done helps you to create a safer Velocity if not exactly a STOL variety to fly in.

••••



Oshkosh 2001 Velocity Dinner

Oshkosh EAA Fly-in dates are July 24 - 30

- **Demo Rides** will be conducted out of Fond du Lac airport (near Oshkosh). Demo rides last between 20 to 30 minutes. The cost is \$150 for up to 3 people. Transportation between Oshkosh and Fond du Lac airports is available. Please contact Velocity to sign up.
- **Velocity Oshkosh Dinner** Held at the Park Plaza Hotel and Convention Center's LaSalle C Ballroom on Friday July 27. Social starts at 6:30pm, with dinner at 7:00pm. You can expect a family style dinner with three entrees to choose from. Cost should be about \$20 per adult and \$10 per child (age 4-10). Please call Velocity to sign up now, or sign up at the Velocity Booth by 5:00pm on July 25th.

*Thanks,
Bonnie*

Are You California Bound?

If you are interested in going to Velocity's California Wine Country Fly-in, please contact the factory to get on their sign up list. Judy, Darla and I are flying over. Hope to see you there. See page 13 for more details... or check the Velocity web site's calendar of events page.

Rick Lavoie

Publishing a newsletter with such a small subscriber base is quite a challenge. Keeping cost (and hours spent) down are important. Here are two things that you can do to help Velocity Views:

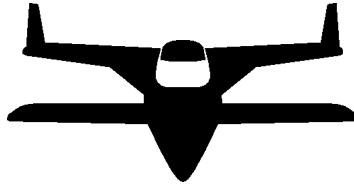
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When you renew late, you cause me all sorts of extra work, as I now need to process each late renewal by hand. There is now a **\$5 late charge fee** for renewals that come in after December 31

• **Pay by check...** Credit card option is **only** for international subscribers (to make currency exchange easy). The time it takes to process credit cards is very very inefficient and costly.

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Time to Renew Your 2002 Calendar Year Newsletter Subscription!
(See last page for details)

For Sale Flying Velocity XL

A bit about my Velocity XL, it has a Don George remanufactured IO-540 with 1930 hours to run. An SL-60 GPS radio with an SL-40 back-up, an Apollo moving map, S-tec model 30 with altitude hold, narco transponder, factory supplied overhead switch panel and circuit breaker panel, VOR and autopilot is coupled to DG and GPS (TSO'd). The altimeter is a single pointer with HG and HP settings for pressure replacement cost, around \$12K. This aircraft was professionally built by an A&P with fiberglass certification. All electronics work was done by an aviation certified electronics engineer. Strobes, Nav lights, heated Pitot tube all top off this aircraft, including JPI graphical engine monitor with fuel flow system. Also fitted to this aircraft are custom blown side gauges, and the wiring is a work of art. All wiring is tidy and platted, better than a Swiss hairdresser. A second trigger to prevent run away trim on the chinamans hat is also fitted as is emergency complug for the radio. This aircraft was built to attain 101.28 standards so each phase of construction was overseen by government department of aviation. This aircraft could not demonstrate a sub 62 knot stall at full gross so it was registered experimental. Any hardware supplied by the factory that was designated aviation certified was discarded and replaced. The aircraft has a 3 blade MT constant speed prop and gets along very quickly.

For anybody who is interested, they can contact Leon R Howe at:
Home: +61 2- 4655 4989
Work: +61 2- 9609 4399
Or email me at: leonhowe@hotmail.com

I can also provide pictures for anyone who is interested
Price \$145,000 USD

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Velocity Price Increase Buy now and save!

If you're on the fence about when to order your Velocity kit, keep reading! Order before our July 31st price increase and you lock into savings. Also, the Velocity FG (fixed gear), with two gull wing doors, is currently being offered for a fantastic value at \$25,500... a savings of \$9000 from the RG version... but only for a limited time. Remember, there are no other 4-place kit airplanes in the 200mph category with the features and kit completeness of the Velocity. Call today and place your order.

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Velocity SUV FG	\$23,500	\$25,500
Velocity FG	\$25,500 (limited time only, save \$6,000)	
Velocity RG	\$34,500	\$36,500
Velocity XL FG	\$35,500	\$37,500
Velocity XL RG	\$40,500	\$42,500
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1st	January 15th
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4th	October 15th

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Quarter:	Mail Date:
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3rd	June 1st
4th	September 1st

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1) Send it on a 3-1/2" **computer disk** (Mac or Windows). This saves us from re-typing all that text. Don't format your text, just give us raw text, with no underlining, bold, or any other type of formats. We also can take Zip 100 disks.

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