

# VELOCITY VIEWS

Volume 9

## '96 Contributor of the Year: Dave Black



Dave by N6VK. Should be flying in Spring 1997

**C**ONGRATULATIONS and thanks are in order for Dave Black, our 1996 Builder Contributor of the Year! If you take a moment to review past volumes, you will note that Dave is a very frequent contributor. But quantity yields to quality when this annual award is made.

When performing my role as editor, I review each submission and ask "is this something that the average Velocity builder wants to know about?" In Dave's case the answer

has always been yes. In fact a few months ago I received a call from Hugh Hyde (last year's Contributor of the Year), raving about how wonderful Dave's tip on "making cap strips" was. I would be willing to bet that if you visit a typical Velocity project, you will see Dave's influence at least once! In my case, you would find Dave's "Tip over Cradle", his three point bottle jacks, cap strips for upper strake installation, nose gear

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## Contributor of the Year

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guide, concentric torque tube bearing installation mod, strake top reinforcement (pilot side entry area), and his "wing pin" that is built into the out-board LE strake for extra LE wing support. That's seven of Dave's ideas that I used. How about you? How many Dave Black ideas have you used? <By the way, whenever I do even a slight modification, I always run it past Scott or Duane.> My point is very simple: Thank you Dave!

This past September, I moved my parents down from New England to sunny Florida. A side benefit of this trip was that Interstate 95 passed near Woodbridge, Virginia, Dave's home. This was an opportunity to meet Dave for the first time and view his project. What I found was a meticulously constructed Velocity RG, about 20 Tonkinese show cats, and two very likeable people! To give you an idea of Dave's workmanship, imagine looking through the rear strake behind the rear fuel bulkhead and fore of the center spar. On Dave's Velocity, the access holes are

all lined up 100% perfect (like looking through a telescope) and symmetrical, not to mention they look ready for priming. Now when the wings are on, nobody will ever see this area! Dave's entire plane is constructed with this high level of workmanship.

I recently e-mailed Dave to inform him that he was the Contributor of the Year and asked both him and his wife Karen to write a few words. Here is Karen's article first:

### How it all began!

It all started with Dave subscribing to AOPA Pilot, Kit Planes, General Aviation News & Flyer, and U.S. Aviator. Then came membership in EAA and a trip to Sun n Fun. But then he started making lists, comparing kit models by speed, range, price, payload, etc. He charted comparisons. And compared charts. So when he called home from Sun n Fun in 1994 to say he had put a deposit on a Velocity, I was not surprised.

Aviation seeds had been planted

much earlier. When he was three his parents often took him to Adams Field in Little Rock to watch DC-3s land. He always loved to watch planes. As an early teen, he and a buddy would ride their bicycles across Fort Worth to Russell Field south of town. One day a rancher hired them to wash his Aztec. It definitely needed washing. He regularly landed it in a cow pasture. . . .

After becoming a television engineer in Washington, D.C., the first money Dave earned went toward flying lessons. He went on to earn his Commercial License and Instrument rating. After we married, we bought a lot located conveniently near Woodbridge Airport. We designed a house to accommodate our home theater hobby and Dave soon filled the back yard with satellite dishes and an amateur radio tower. Later he overhauled and modified a 70mm movie projector.

Frustration with plane rentals led to his buying his first airplane, a Cessna Cardinal. Other planes would

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*Dave and Boy-Boy by N6VK. Sanded and ready for priming, the fuselage looks somewhat scruffy.*



*Continued from previous page*

follow, but he always put his personal stamp on each one: redesigning instrument panels, changing paint designs, and keeping everything working just right. Of course, the ultimate way to personalize an airplane is to build it yourself.

Life hasn't been the same since the Velocity kit arrived. The cars were forced out of our garage. Plane parts were strewn everywhere the garage, the workshop, even our storage unit. Velocity Views readers have seen how he temporarily enlarged the garage while the wings were on the plane during strake closing. In retrospect, Dave says it is possible to build a Velocity in a two-car garage, but he wouldn't do it again. He recommends a place big enough to put the entire plane together and still be able to walk around it. And since our garage is attached to the house, we have learned that fiberglass dust, like drywall dust, gets into everything.

Aircraft building gives Dave the satisfaction of solving problems, and puts his engineering talents and building skills to good use. He says it is like putting together a huge puzzle with the reward of flying his own plane when it is finished. He has learned a lot about himself during this building process, too. He is more of a perfectionist than he realized. He can't rest until everything is the best he can make it. Sometimes he builds a part two or three times before he gets it just right. Half the fun seems to be studying the situation and figuring out the best way to do something. He has found the process so enjoyable we're even discussing our next airplane likely another Velocity.

One of Dave's favorite aspects of home-building is the camaraderie with other builders. After receiving so much helpful advice, Dave has tried to return the favor via his submissions to Velocity Views. Here at home, pilot and non-pilot neighbors and friends drop by to watch the progress. Building a plane turns out to be quite a social occasion.

*by Karen Kinzer (Dave's Spouse)*



*Dave has been with NBC for 14 years. Television happens.*

### **Considering building a Velocity?**

Other than the factory, I have not heard of anyone completing a Velocity in less than a year. Building an airplane is a big job. And remember: When your kit is completed, your airplane is only half done. Count on it.

Before starting to build, I'd suggest you take the time to get to know other local Velocity and glass-airplane builders. Aircraft builders are the friendliest bunch of folks I've met. Every one has information to share. Join the EAA and take advantage of their substantial expertise. Subscribe to the Central States Newsletter (9283 Lindbergh Blvd, Olmsted Falls, OH 44138-2407). If you're on the Internet, keep an eye on [rec.aviation.homebuilt](http://rec.aviation.homebuilt). And don't take the Velocity Manual as gospel. Read well ahead to gain an understanding of how it all fits together. Be sure to ask questions if you don't understand something.

If you have not worked with fiberglass before, take a course or have an experienced builder show you how. There are maybe a half-dozen tricks to fiberglass work which you will use over and over again. Take the time to learn the tricks in the beginning and your whole project will go together faster, lighter, and stronger. After a while you'll discover you can build nearly anything with fiberglass. It's truly a magic medium.

Special mention must be made of the product support the Velocity Family provides. My questions have been many and the Swings and their staff have always been there with the answers. I recommend Velocity kits



*Adjusting amateur antenna 118 feet up. You could watch Woodbridge Airport from here until it became a shopping center.*

not only because of the plane, but also because of the terrific factory support. And the kit is continually being improved.

*by Dave Black*

### **Central States Association Plans National Canard Gathering**

Mark your calendar for June 13-15, 1997 for the "Seventh National Gathering for Canard Type Aircraft" to be held at Butler Memorial Airport (BUM) in Butler Missouri. Social & flying events, races, contests and away from the airport activities are all planned.

For information, contact Tom Jordan, 401 Havana, Butler, MO 64730, Phone # 816.679.3328

*Editor's note: If you are not a member of CSA and would like to join, refer back to Volume 1 page 7. I am a member of CSA and strongly suggest that you join. They run a number of great fly-ins and publish a quarterly newsletter, all for only \$20 per year. CSA has a membership of over 900 builders and canard flyers.*

# First Flights: William Huisman is First Elite to Fly

RECEIVED MY VELOCITY KIT , Fixed Gear 173 Elite December 22, 1994, one day before my Daughter was born. Started building January 1,1995 and first flight conducted at May 3, 1996. Total building time 2000 hours, excl. same amount of time spent at Home Depot and in Spruce Catalog.

Building the Velocity was fun, I was able to put entire plane in my basement and built at home, so all free time could be spent building. My plane was the first Elite under construction, so some parts I had to wait for, and others I helped Sebastian develop. I had no previous experience building planes, but with common sense, my Makita Grinder and the help of Sebastian no major problems were encountered during process. Fitting the doors, building the tanks and intersection wings-Strakes were major time consumers. Also it is true that when your project looks like an airplane, and you think you are 50% done actually you are at 20%. Wiring, engine installation and upholstery takes at least as long as structural work.



*William Huisman stands near his beautiful Velocity 173 Elite*



*This photo shows William's distinctive paint scheme, with the co-pilot side Elite gull wing door open.*





First flight was great, no trim was necessary but the excitement related...certainly took away a couple of years of my life. The plane cruises at 165 Knots, burning 10.5 GPH. I was able to pick up a New IO-360, installed Jeff Rose Electronic Ignition (highly recommended), B & C Starter, as well as a Rocky Mountain Engine Monitor (also good choice). Engine runs great at 190 CHT, but I battled high oil temperature for a long time.

I tried everything, but only after I separated the oil lines to the oil cooler, oil temps became within limits. Now one line runs in pilot duct, other in co-pilot duct, and in my mind everybody should do this. I installed Two King KX 155, Glide Slope, KT-76A Apollo 360, Navaid Wingleveler coupled to GPS, and CD Player into PM 2000 intercom. Also I installed an Air-Par, a little device that reads out the Transponder Encoder, handy for IFR flights. Until now I hopped 110 hours, and finally all little projects are off my to-do list. Everybody stands still at the plane at fly ins, due to the paint job, as well as the design. Paint used was Glaserut, with a clear coat finish.

For all you out there building, it is worth the time, so keep going. I do not like to be the only Velocity at fly-ins.

*William Huisman  
Clifton VA 22021  
Compuserve : 102142,3271*



*Huisman's panel is well equipped*



### **Looking for First Flights and Flying Velocity Stories!**

When you get your project airborne, send photos and information about you and your Velocity to Rick Lavoie at Velocity Views Newsletter! Your published story becomes inspiration for the rest of us builders still building.

### **Velocity Inc. has a New On Site Instructor**

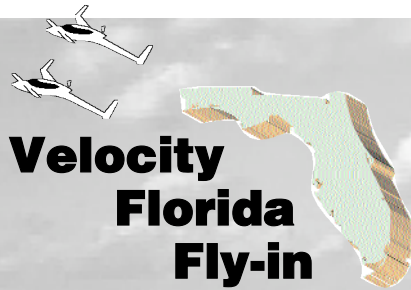
Tom Jeter is now on board as an instructor for Velocity Inc. in Sebastian Florida for check-out flights and required Bi-annual or Instrument competency checks. He will also be available for Initial Check flights.

Tom is a CFII & MEI and received his Part 141 training at Flight Safety Academy in Vero Bch FL. Tom is a decorated veteran of Desert Storm with the USAF.

### **Alexander Sportair Announces Workshops**

A two day composites workshop for kit builders is one of the many offered by Alexander Sportair. The cost is \$219 and is offered in various cities throughout the U.S. To get on their mailing list call 800-967-5746 or via internet at [www.sportair.com](http://www.sportair.com)

This is a good workshop for beginners. When I took it a few years ago, it was very much a hands on training format.



# Velocity Florida Fly-in



17 aircraft (8 Velocities) landed at St. Augustine airport for the second Velocity Florida Fly-in sponsored by Velocity Inc. 68 Velocitites enjoyed a dinner get together Saturday night that featured Attorney Mark Ewart's talk regarding liability for experimental aircraft.

**T**HE WEATHER WAS CLEAR, crisp and windy for our Fall 1996 Velocity Florida Fly-in held this year in St. Augustine Florida. Seventeen aircraft (8 Velocities) arrived at St. Augustine airport for the second fly-in sponsored by Velocity Inc.

Saturday noon we enjoyed a cookout with lots of great food, fellowship and Velocity hangar talk. We held the cookout right on a special flight tarmac reserved for our group and aircraft. Throughout the morning and early afternoon hours, you could see groups removing cowlings, looking over interiors, and sharing ideas. After lunch, Duane demonstrated the Franklin 6 cylinder with the IVO in flight adjustable speed prop. He was off the ground at 600 ft of runway, climbing at 200 ft per minute at 100 kts indicated. He came around the pattern and did a

low approach fly by at 200 ft altitude right by our area. He was indicating 190 kts with less than full power. Duane was alone and had about 25 gallons of fuel aboard. I can verify these numbers as Duane took me up for the same demo a few months ago. Shortly thereafter, I ordered the Franklin and IVO prop for my project.

Most of us (55 Velocitites) then loaded up for a tour of St. Augustine, the oldest city in the U.S. Lots of history and beautiful buildings going back to 1565.

Saturday night saw 68 Velocitites enjoyed a dinner get together that featured Attorney Mark Ewart's (fellow Velocity builder/pilot) talk regarding liability for experimental aircraft. Mark addressed liability aspects for construction, ownership and sale of an experimental aircraft. It was obvious that Mark's topic was of keen inter-

est, due to the number of questions he fielded from builders. Mark even passed out a sheet that included legal language that should be included in a sale agreement. For those of you that missed the dinner and have an interest in liability issues, contact the AOPA or the EAA and ask for their info kit regarding sale of an experimental airplane. I used it when I sold my Long EZ. If you are not a member of EAA & AOPA, see Volume 1 page 7 for all the details. After Mark's talk, we all enjoyed a Q&A session with Scott & Duane. Engines and props were among the many topics discussed. This is my favorite part of the fly-in, as I can learn a great deal from other builder questions.

Special thanks to the Swings for sponsoring this wonderful event! They paid for our cookout, transportation van, and subsidized the cost of the old city tour.



by Duane & Scott Swing

### Builder Notices:

1. Attention Elite builders who received kits before 10-12-96. The plans call for the holes in the door that accept the latch pin tubes to be centered 15/16" from the outside

surface of the door. Some kits that were predrilled at the factory were drilled too low. If yours were too low, you will have to redrill them at the proper location and fill the other hole in with microglass.

2. If you have a problem with your master cylinders leaking around the brass elbow, run an 1/8 pipe thread tap through the threads in the cylinder. This will allow you to tighten the fitting farther.

3. The spring in the Elite door latch crank mechanism may not be strong enough in some installations. It is permissible to get a stronger one that will give you a more positive overcenter lock when the door is shut.

4. The mounting base on Matco axles should be 3/4" thick. There have been a couple of reports about 1-1/4" thick ones! Even if you have the 3/4" ones you may want to machine 1/8" off of the base. This will allow the RG gear to go further up into the wheel well.

### New Faces

We have someone new for you. His name is Tom Jeter (rhymes with Peter) and he has joined us to assist us in the task of flight training and demos. Tom is a certified flight instructor with single and multi-engine endorsement and an instrument rating. Tom will be giving check-outs in N81VA and can include a bi-annual as part of your check-out if needed. This isn't to suggest you come to us without some current flight experience. In addition to his duties as check-out pilot, Tom has agreed to do 1st flights for those builders who request it. As an added bonus, if within a reasonable distance, Tom will fly our N81VA to your airport for the first flight and will then provide a check-out in N81VA so your ready to fly your own airplane without the necessity of coming to Florida for this check-out. Due to

FAA regulations, only one person is allowed in an experimental airplane for the first 40 hours, therefore he cannot instruct in your airplane.

The price for this service is still being worked out but will probably be as follows:

Round trip in N81VA at \$50.00 per flight hour. (Commercial airline fares, or mileage, if Tom doesn't fly N81VA) He will charge \$90.00 per day for his time plus any out of pocket expense. In addition, the pre-flight inspection and first flight will cost \$300.00. Tom will prepare a list of necessary corrections that need to be made before second flight to include rigging, engine cooling, toe-in/out, radio, and any other item needing action. The check-out will be \$50.00 per flight hour in N81VA and \$30.00 per hour for Tom while instructing. (One days fee will be waved if exceeded by instruction charge). Separate checks will need to be prepared to cover Tom, as he is acting as an independent contractor.

A checklist of things needing to be completed prior to Tom's arrival is being worked out and will be provided at a later date.

If you have any feedback for us on this matter, let me know.

### Sun N Fun

Sun N Fun is being held from April 6 - 12. Velocity will hold its annual banquet on Sunday night April 6th at 6:30 pm with dinner starting at 7:00 pm. The banquet will be held at the same place as last year. The Imperial Golf & Racquet Club is located at 6 Country Club Lane in Lakeland FL (see map printed in Volume 5, page 4). Please RSVP as soon as possible with the factory, but no later than April 5th. As of this writing, the cost per person was not known, but last year it was \$20 for adults, and \$10 for kids under age 11.

If you need a ride, be at the Velocity booth by 5:30 pm Sunday and we will hook you up with a ride. If you have a car with extra seat(s), please stop by the booth to help us shuttle people to the banquet.

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## Future Fly-Ins

We need your help to plan more Velocity Fly-ins. If you think that your hometown airport would be a great site for a Fly-in, give Duane a call at the factory or Rick at Velocity Views. Also, we need to line up speakers for these events, that can address issues of interest to Velocitites. Any help you can give us will be appreciated.

Our goal each year for fly-ins is as follows:

- One **Florida Fly-in** moved around to a different location each year. Since so many of our builders are located in the Southeast, this event should continue to be well attended. It is also a chance for builders from other parts of the country to take a warm and sunny Florida trip!
- One **Regional Fly-in** moved to a different part of the country each year. The idea is to hold a fly-in in a region that has a known number of Velocity builders, and also to provide a new far away adventure flight for other Velocitites. There are so many beautiful places in the U.S. to fly to.
- One **Tropical Fly-in** that has only one theme: Sun, fun, and relaxation for Velocitites. 1997 will see the third annual Bahamas Fly-in to be held at the beautiful Coconut Cove resort in George Town.
- **EAA Fly-ins:** at both Oshkosh and Sun n Fun, Velocity holds a dinner banquet. The factory mans a booth.

The ultimate goal is to build comradery and lasting friendships within the Velocity family!



## Factory News

*Continued from previous page*

### Franklin/IVO Update

We are now at about the 75 hour point on the Franklin engine with no problems to date. All previous difficulties with restricted RPM have been solved and we continue to fly as time is available. The IVO electric prop has about 40 hours now and continues to perform without a hitch. IVO will be building a new set of blades with more pitch to reduce the maximum RPM to about 2800, the red line on the Franklin. I can now get about 3000 RPM at max power and at 100 knots climb speed. This will also provide me with the ability to get an equal reduction in cruise RPM. The max RPM range of the IVO is somewhat restricted due to the design and I can use the extra RPM on the low end. Those of you who have already opted for the Franklin may want to wait on the IVO prop until we can complete the testing on the new blades.

We (actually one of our Velocity flyers) are starting the test program on the IVO Lycoming combination and only time will tell if the IVO will handle the Lycoming properly. More later.

### Reflections

On rare occasions I get the chance to reflect on the past four years since Scott and I took over the ownership of Velocity. We have met many beautiful people and have discovered a new life style that guarantees envy from many of our friends. Since we all enjoy the building and flying (well, flying anyway) airplanes, where else could I do exactly what I love to do and have the advantage of being paid for it? On occasions, Bonnie and I slip into the confines of a big jet and go somewhere exciting. This is one of those occasions. Albuquerque for most of you is just another city somewhere out west. To those into hot air ballooning, it is Oshkosh. Hundreds of gorgeous balloons (Over 800 in fact) drifting slowly through the mist and

cool early morning sky, destination unknown. Pilots and passengers caring less about where there going, than the serenity and beauty of getting there. This is how building and flying our Velocities should be. Less care about the destination and more about getting there. Many of you need to loosen up. The building of an airplane for some is as therapeutic as a Sunday morning game of golf. To others, exactly the opposite is true. As soon as something doesn't fit as we think it should, or we can't find that part we want, or we don't understand the plans, or the video isn't clear enough, or whatever, we get up-tight. We call Velocity and complain about this or that, we get on the Reflector or the internet and make enemies with everyone associated with whatever, or whoever, is causing the burr under our seat, or we send a nasty letter to the Velocity Views expecting all who read to agree. We get into verbal or written warfare and completely loose sight of one of the most rewarding experiences many of us will ever have, the building of an airplane. Some of you won't have the foggiest idea of what I'm talking about because you are already enjoying this once in a lifetime experience. Some of you will probably read this and become irritated because it describes exactly your feelings. If you fall into this last category, think about those balloon people as they float effortlessly across the morning sky without a care in the world. Would it not be to all our advantage to, on occasion, look at life a little less seriously?

*Duane*

### Reporters Can Make Your Day

Mike Watson and Denis Miller are both building Velocities in a Yonkers, New York warehouse. Mike sent me an article written by a reporter after an interview with Mike and Denis. Although most of the article was very informative, some was outright humorous. To quote. "Mike has about 10 years' flying experience and 100 hours of time with a Cessna Piper Malibu." "The price of an assembled Velocity Elite purchased directly from a

manufacturer could run as high as \$250,000.00." "This is a vary safe plane," explained Watson. "It cannot spin nose down into the ground. It is built in such a way that if the engine were to quit it would glide five miles. The lighter the plane, the longer the glide." "Navigation is also easier now with required computers in private planes. Every plane must have a GPS (Global Position System) built into the cockpit controls," "You stay on a straight line and arrive at the destination easily." Miller also explained that the planes are all white which keeps possible sun damage to the fuselage at a minimum. "If you flew a painted plane out in the Western desert, it would come in with lots of damage."

Well, obviously Mike and Denis were misquoted on many of the things they told this reporter. It is, however, a good article and the pictures that went with the article make the Velocity look very good. Congratulations to both Mike and Denis for going "out of their way" to promote the Velocity and the EAA in general. Perhaps more of you would be shocked at how willing your local paper would be in doing a story on your Velocity project. When we were in Dayton, Ohio, the local paper did an article on our Velocity with a full color picture of our airplane on the front cover.

*Duane*



Scott, Duane & Jeff around the new "XL" fuselage lower half. They have made tremendous progress on the "XL" since I took this photo back in November. In fact, at the rate they build, I would not be surprised if they are finished with the glass work by the time this volume hits the mail!



# Kit Plans Changes "KPCs"



*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 043**

Affects: All Velocity 173's  
Manual Section: 4.4.1  
Date of Change: 15 Oct, 1996

Change the second sentence to read: There should be at least 90" in each piece.

## **KPC 044**

Affects: All fixed gear Velocitys  
Manual Section: Figure 8-7 and page 8-8  
Date of Change: 15 Nov, 1996

Change the length of the second layer of two TRIAX from 20" to 21-1/2"

## **Internet Homepage for Velocity Inc.**

Velocity Aircraft has an official company homepage. Here is the address so you can see what a great job Travis Young has done: <http://www.VelocityAircraft.com>



*Big gear doors for the new "XL" model*

## **KPC 045**

Affects: All fixed gear Velocitys  
Manual Section: Figure 8-8  
Date of Change: 25 Sept, 1996

Change the approximate dimension from the fuselage flange to the center of the TRIAX layups from 9" to 9-1/2"

## **KPC 046**

Affects: All fixed gear Velocitys  
Manual Section: 9.1.1  
Date of change: 25 Sept, 1996

A clarifying sentence has been added to the end of this section: Later you will use the gear itself to drill the holes.

## **KPC 047**

Affects: All fixed gear Velocitys  
Manual Section: 9.1.4  
Date of Change: 15 Oct, 1996

The major axis on the layers of TRIAX should be on the long dimension.

## **KPC 048**

Affects: All Velocitys  
Manual Section: 10.4.1  
Date of Change: 15 Oct, 1996

The major axis of the TRIAX should be across the width of the fuselage.

## **KPC 049**

Affects: All RGÖs  
Manual Section: 9.5.3, upper main gear door attachment tab  
Date of Change: 15 Nov, 1996

The location of the attachment tab needs to be clarified. It is located between the fuselage side and the bend in the gear door, 2-3/4" from the bend for a 173 and 4" from the bend for a standard wing model.

This KPC also changes the method of attachment to the gear leg. It still attaches to the gear door itself with aluminum angle and screws. After attaching it to the door, put a

little bondo on the glass tab and set the gear door in place, flush with the strake. When the bondo has cured, carefully remove the gear door, sand the bondo and mating areas, and glass on with two plies BID on both sides with at least a 1/2" overlap.

## **KPC 050**

Affects: All Velocitys  
Manual Section: 15.2.1  
Date of Change: 15 Nov, 1996

Note that Franklin engine installations do not require the top center Triax layups on the firewall.

## **KPC 051**

Affects: All Non-Elites  
Manual Section: page 15-11  
Date of Change: 15 Nov, 1996

Change the designation of the washers mentioned in the first paragraph to AN960-416L.

## **KPC 052**

Affects: All Fixed gear Velocitys  
Manual Section: 14.4.2 Mounting Tabs  
Date of Change: 15 Nov, 1996

Change the whole section to read as follows:

Cut twelve 3" x 6" pieces of TRIAX, axis long. Pre-wet three plies at a time on plastic. Lay plastic on a surface that is 6" wider than the sump tank. Sand rectangles in the vertical center of the tank on the sides and back. Apply two of the 3-ply pads on the back of the sump tank, centered on the sides, lapping 4" onto the back of the tank and letting 2" extend out as a tab. Lay the tank down on the plastic covered surface, back side down, and smooth the tabs straight against the plastic. Apply the other two 3-ply pads onto the sides of the tank, aligned with the above pads, lapping 4" onto the tank sides and 2" onto the above pads, forming a 6-ply, 2" x 3" mounting tab.

# Short Circuit



by Martin Hadley



## What!?! A gear retraction on the ground? It'll never happen to me!

"It'll never happen to me." Believe me, it has happened. And not to just one or two Velocity builders. In fact, it probably has happened to more RG owners than we know about, and we know of several! That is the very reason we have started recommending the use of the air speed switch. The intent of this is to prevent someone accidentally turning "on" the battery master switch only to find out the landing gear control switch is in the "UP" position.

Since there is no easy means of duplicating the function of a "squat" switch (found on virtually every landing gear system with a strut type system) we are detecting our aircraft as being "on the ground" via an air-speed switch. Let's face it...the only time you want to be below stall speed for any length of time is when you are no longer flying and hopefully "on the ground"!

Pilots typically get into an airplane and throw on the battery master switch before a complete scan and determine the status of each and every switch. It would be extremely valuable to have a way of keeping the gear pump from starting up and retracting the gear. (Ouch! Nose gear doors! But hey? Didn't you think that composite structure stayed in tact pretty well for all the weight on the nose?)

By installing a normally open contact air speed switch in the con-

trol line from the gear position switch to the "UP" solenoid we can prevent the pump from running until a set airspeed is obtained, typically just above stall speed. Once that air speed is achieved, the connection is made and the gear pump starts to run. Sounds simple, and it actually is.

The primary reason for adjusting the switch above stall speed is to prevent your pump from starting while your going down the runway, say, 55 knots. When wired properly it will not interfere with your gear down operation. And in a worse case scenario, the switch does fail? What then? Your gear is down and locked. You can't retract it. Personally, I would prefer it be that way other than the other way around!

Velocity offers an airspeed switch with instructions on how to install it in your pitot system, connect it electrically to your gear "UP" solenoid control line, and how to adjust the switch for the speed at which you select. All this for the price of two bags of groceries! What a deal! (Cheap insurance if you ask me!) \$43.00 plus shipping and handling. Tax if applicable. Can me or Jeff and we will be happy to send you one.

### General Tips

General rule of thumb: The head of a bolt will go forward, above, or inboard of the shank of the bolt. In the event a nut should come loose, the prevailing "G" forces one normally incurs during flight will have a tendency to keep the bolt in place. When using steel lock nuts, the exception to the rule applies!

Did you know?...There is a top and a bottom to most flat washers. Most flat washers are manufactured through a stamping process. If you look closely, one edge is rounded and the other edge is squared off. Generally, the rounded side will go toward the bolt head.

General rule of thumb...Always put a washer under the nut when using AN hardware. Use a washer under the head when you want to

better distribute the "load" to the surface you are bolting together.

ALWAYS...remove the negative, or ground (-), side of your battery first when you go to remove a battery.

A Good Idea...Whenever you are using a car battery to test any circuit or device, use a fuse or a circuit breaker in the positive, or power (+), lead. Most car batteries are capable of delivering several hundred amps instantaneously, and if you are testing something that is shorted out, the sparks could really fly!

General rule of thumb...most battery master relays are energized through a switched ground (-). Most starter relays are energized through switched power (+).

Did you Know?...Most battery relay coils draw 1 amp, or less, continuously. Most starter relay coils draw 2 1/2 amps or more continuously.

Did you know?...Fiberglass epoxy can start to soften when it is exposed to temperatures approximately 45 degrees hotter than its cure temperature for several hours. Try to maintain a room temperature of at least 70 degrees during the construction of your airplane. (This applies especially to the people building up north during the cold winter months and plan to fly to Tucson in the summer months!)

Most aviation flight and engine instruments are held in place with #6-32 screws. Occasionally #4-40 screws are used. Blacked brass screws are available so that a magnetic compass is not effected by them.

Try not to use a gloss finish on your instrument panel. While it may be beautiful on the ramp, flying home with the sun over your shoulder can be a real challenge. A soft semi-gloss is OK and there are a lot of flat colors out there that will provide both functionality and beauty!

Did you know?...If your fiberglass instrument panel is at least .080" thick, you may drill and tap it to secure such items as the panel and radio dimmer assemblies and the

*Continued on next page*



## Short Circuit

*Continued from previous page*

gear switch panel that we offer. Drill the panel with a #33 drill bit and then tap it with a #6-32 tap.

There are three different complete basic drill sets....number, letter, and fractional. The number set goes from #1- #60 (#1 being the largest (.228"), # 60 the smallest (.040")), the letter drill goes from "A" to "Z" ("A" being the smallest (.234"), "Z" the largest (.413")), and the fractional from 1/16" to 1/2" in 1/64th" increments. The letter index "picks up" where the number index stops.

Holes saws can be purchased from size 9/16" to 6". Most common in aviation instrument panel work is 1" (1" gauges), 2" (automotive type gauges), 2 1/4" (aviation type gauges), and 3 1/8" (flight instruments and large engine gauges).

Hint - when using a hole saw, drill a small pilot hole in the center of your uncut instrument hole from the front of your instrument panel. Then, using your hole saw, cut from the back side of your work to the front side. Any "chatter" that your hole saw may have when it first starts to cut will not show up as a ragged edge on the front side of your work!

Did you know?...The charge voltage from an alternator (or generator) should be 1 volt higher than the desired fully charged voltage of the battery. If you charging system is putting out 13.75 volts (which it should be!), your fully charged battery should read 12.75 volts when checked with the charging system turned off.

Did you know?... Most alternators require at least 10 to 11 volts input into the regulator before it will start to charge a battery. Do not prop start an airplane with a dead battery and think your alternator will automatically charge the battery up!

Most magnetic interference to a wet compass comes from steel screws, nuts, or rivets. Occasionally, navigation instruments, especially nav indicators from Narco or Terra, will cause a wet compass to be in error. Please check the proximity of



## Safety Corner

**Accident & Incident Reports,  
Maintenance & Service Difficulties**

### Lycoming AD Note and Service Bulletin

The FAA has issued an AD note on the 360 series engines that may apply to you. The AD note clarifies the service bulletin mentioned in the last newsletter regarding the engine driven fuel pump. The official number is AD 96-23-03 and is a replacement for the SB #525A. Compliance is within 5 hours time in service. Most of you who properly filled out your FAA registration information will have already received the AD from the FAA. If you did not receive one, ask for it at your local FBO or call me and I'll fax you a copy.

Lycoming has also sent out a mandatory Service Bulletin (SB) 527B regarding piston pins. This will probably also become an AD note within a month or so. This SB will only apply to those of you who have purchased new Lycoming engines or engines overhauled using Lycoming piston pins, between December 95 thru September 96. A rather simple

these items to your wet compass when checking for magnetic interference.

As soon as practical after you have installed all of your radios and pitot/static instruments, have a certified repair station (that is equipped to check those systems) check those systems out! Perfect installation technique does not make up for poor (or no) calibration of electronic gear, or faulty movements in barometric sensitive gauges.

**New e-mail Address**  
Velocity Views Newsletter  
has a new e-mail address:  
lavoie@aug.com

inspection will identify the faulty cylinders with the bad pins. If you have had your engine overhauled and suspect this may be a problem, contact your overhaul agent and find out if your engine is suspect. I can fax you a copy of this SB if you can't find one.

### Service Caution: Fuel Injected Models

We have had one reported air flow stoppage to the fuel servo due to the aluminum 3" hose adapter coming loose from the wing root where it was pop riveted to the fiberglass wing root rib. The resulting hose collapse restricted air flow to the servo, causing a large reduction in RPM and an immediate airport landing.

The proper installation of this 3" adapter would be to micro glass the flange of the adapter prior to the pop rivets. An alternative method (one that I use) would be to run a bead of silicone around the adapter flange prior to pop rivets. This will insure proper attachment, even if the pop rivets were to fail.

As a rule of thumb, NO attachment using pop rivets where the bulb portion of the pop rivet is into fiberglass should be allowed without secondary attachment.

### Service Note: Modified Shimmy Damper on Nose Gear ("nylock" style jam nut)

We know of one instance where the "nylock" style jam nut tightened from the recommended 5-10 lbs to over 20 lbs. All builders with this new nylock jam nut should check it at once and report any problems to the factory. The fix is to drill and tap for 8-32 set screw.



# Views from the West

By Mark & Nancy Machado

Greetings once again to everyone from all the folks here at Velocity West. The Velocity West office is now well into its second year of operation and keeping very busy. More and more people are learning of our existence and turning to us for everything from builder's assistance to kit purchases to simply buying a T-Shirt. The Swings created this office, at least in part, to help "spread the load a bit." This office provides you one more valuable resource to help you in the successful completion of the construction of your Velocity. Use us! We don't mind.

We regret that because of deadlines and space, Rick found it necessary to edit our column in volume 8. Our apologies... we'll cover what was missed in this article.

**NEW COMPANY DEMO PLANE N94VA FLIES:** One of the very proud items that was inadvertently missing from the last Velocity Views issue was the fact that we flew our new demo plane for the first time on October 5, 1996. This project, a 173 fixed gear ELITE was started by the employees here at Velocity West in November of 1995. Not only was the entire construction process video taped, but many new features were tried which hopefully will become standard arrangements if further flight testing continues to prove satisfactory. More about that in future columns. That first flight can only be described as ordinary with a little bit of heart-stopping thrown in. To be absolutely honest with you, I left out one "itty-bitty" cotter pin. That cotter pin happens to be on the top of the throttle lever, secures a small castle nut, as it connects to the fuel injection servo. Everything was fine for most of 30 minutes of flying, until normal engine vibration started to loosen the unsecured castle nut. Can you imagine what happened? There is a reason why it is very wise to orbit your airfield during your first flight

and the second and third for that matter. One sharp 90-degree turn and a simple idle glide back to the runway made everybody on the ground think I was just showing off. Little did they know!

That little cotter pin is where it should be now and the plane is waiting for people to come look at it and go for a ride. Just call us and set up an appointment.

Since that first flight we have traveled quite a bit with the new plane and has it been fun. One of the most interesting stops was at Edwards Air Force Base for their annual Air Show in October. We actually got to land on the same runway the Space Shuttle lands on. Imagine this: the tower controller says, "Report right base Runway 04." Now understand a few things here. First of all that "right base" is over a massive dry lake bed that is filled with what seemed like hundreds of oil outlined runways and secondly, that Runway 04 is 15,000 feet long. So the question is: "When are you on base?" The scale of things is way off here! Do you pretend you're a 747 or do your standard tight (at least for me) Velocity approach? Well, we split the difference, got on the ground and taxied forever. That was OK though. They put us in a huge hangar real close to a B-2 bomber. Nice company! They treated us very well and we especially want to thank our host, Col Terry Tomeny and his family, for their wonderful hospitality, especially for that little private tour of the base. Do you think it helps when your host is the number 3 in command at the base and is building a Velocity?

## NEW PRODUCTS NOW AND IN THE FUTURE:

The fuselage saddles we produce here at Velocity West continue to be a real convenience for the builders who have been using them. They are designed to help hold your lower fuselage in position while you are

doing all that "lower fuselage stuff" and you want to keep things straight and level. They sell for \$70, require a little work on your part, but having built three Velocitys now, I know they really do the trick.

Two features we have tried on the new company demo plane that are showing good promise and should be available to you builders, if you wish, are an engine cooling plenum arrangement and front seats for the Elites which are just slightly smaller in width.

The engine cooling plenum has been designed to utilize the 360 Lycoming in its standard down-draft cooling arrangement. No baffling is required, except for the very small pieces of lower inner-cylinder aluminum baffling that you see as standard equipment with most Lycoming engines on the market. This plenum arrangement we have developed for the Lycomings here at Velocity West is very similar to the plenum arrangement Scott and Duane are using on the Franklin in Sebastian. More about the availability of the plenum as our development continues just a little more.

Some of you may have noticed that with the standard seats in an Elite, the fit is just a bit tight. They fit, but given everybody's varying definition of what is the center in the fuselage, you may find it is a little bit tighter than desired. For those folks, we are developing a slightly narrower front seat. You don't need it at all for the back seats. We should be done with the molds and producing products by mid January. More about costs, trade-ins, etc in our next column.

Speaking of mid January, that is also our target date for the completion of the new video tapes. As many of you already know, new tapes are finished and available for the WINGS, WINGLETS AND CANARD. Basically what is available replaces (or compliments) Tapes 1 and 2 of the Dan Maher tapes. Currently, we are furiously editing the rest. This ain't easy!

## SERVICE CENTER:

This is more of a reminder than



anything else. Not only is Velocity West the West Coast branch office of Velocity, Inc., but it is also Velocity's Service Center. This means we invite builders to come to our facility and work. Be it for a week or two months, if you can be there, we'll give you a hand. We're not going to build your project, but rather assist, teach and demonstrate every trick we can to make YOU do it faster and better. Give us a call for more information.

Speaking of tricks of the trade, Nancy thought it would be good if we gave you a few. You see not only does Nancy answer most of the phone calls, but she also spends a great deal of time in the hangar "getting her hands dirty." So, we'll call this "NANCY'S 10 TIPS FOR THE MONTH."

Having watched and participated in the construction of now at least four composite airplanes with Mark, there are several things we do here that we take for granted, but might be something new for you. In the spirit of just trying to help, here goes:

1. BUY PLASTIC AND LOTS OF IT: I'm talking here about the real thin stuff (1-3 mils). Buy it in rolls (big rolls), if you can. Use it for wetting out lay-ups over a work table, marking out dimension with a felt pin on top and making it easier to move the wetted fiberglass around. Just don't forget to take it off before the wetted-out fiberglass becomes a permanent part of your airplane.

2. MINI-DIE GRINDERS: It seems like Mark is constantly walking around with a mini-die grinder in his hand. It is usually the "right-angle" variety with a 3M type Roloc 2" or 3" sanding disk attached to it. We go through lots of those disks. He says, "Couldn't live without them."

3. AIR HACK SAWS: These sometimes go by the name of "pneumatic body saws," in the tool catalogs but regardless, seems to be one of those tools that is extensively used. We have several, primarily because between John and Mark, sometimes they both want one at the same time. The import varieties sell for around \$70.

4. BAND SAWS: Absolutely noth-

ing better and quicker to cut everything from windshields to aluminum. Somewhat pricy, but we picked up a new self-supporting one for around \$300. Crack a window once using a jigsaw and the frustration factor alone is worth a few hundred bucks. I know, I've seen this.

5. PAINT STRIPPER GUNS: For us women-folk these look like industrial-strength hair dryers. Great for creating that warm little "micro-environment" when the hangar is 45 degrees. Makes the epoxy behave like it is 100 degrees outside. Again, we have several!

6. HEAVY DUTY SCISSORS: I think at this level they call them "shears." The bigger the better! I think Aircraft Spruce sells a good brand called Wiss for around \$30. When you want to cut through several layers of BID with plastic on both sides, standard scissors won't cut it (pun intended).

7. DRYWALL TROWELS: Forget the cute little rubber wet-out squeegees for doing fiberglass lay-ups. Go to someplace like a Home Depot and buy some serious drywall trowels. Get the flexible kind, many sizes and knock-off the sharp edges. You should see our "Wall of Trowels"!

8. BENCH GRINDER: For removing that left-over epoxy on your drywall trowels the next day, nothing beats a bench grinder with one side configured with a wire wheel. I know this from experience. It's usually my job!

9. PLASTIC CUPS: Although the unwaxed paper cups you get with your kit are nice, guaranteed, you'll run out! When you do, go to one of the discount warehouse stores (i.e. Price/Costco, Wal-Mart, etc) and buy some tall 16 oz plastic drinking cups in bulk. Mark says fill them one-half full, tilt the cup to the side a little, grip that tongue depressor with a vengeance and you can do some fast and furious mixing. Every second counts!

10. URINE SPECIMEN CUPS: No, Velocity is not branching out into the medical supply business, but you need to find a business that does deal in the stuff. We use the clear 6 oz urine specimen cups, purchased

without the lids, for measuring a multitude of things that are expensive. The 1 oz graduations on the side of the cups make that \$100 a gallon urethane paint last a little longer (i.e. you can mix just what you need.....very exact!)

Hope these 10 ideas help with your construction.

One other thought comes to mind: After hearing a builder comment, "There's only three women that read Velocity Views," I did a bit of a survey. I guess I wanted to prove that I wasn't unique! For a two-month period I asked Velocity builders I happen to come in contact with who in their house reads the newsletter. My favorite response was one that went something like, "Are you kidding? She gets it first and tells me what articles to pay close attention to!" The results of my survey indicated that every woman in the household read the newsletter!

I knew from my personal experience, from the builders I communicate regularly with out in the West, there is very much a working partnership going on with the project; not to mention several women pilots that are chomping at the bit to fly their project! I'd like to applaud all the women who are taking an active role in building and flying the Velocitys and change the stereotyping of women only being there "for the ride"!

Thanks Nancy. We'll leave you now, but remind you we are only a phone call or E-mail away for all of your Velocity needs. One thought we felt was appropriate and that we have both thought about much lately with regard to building your own airplane is "BE PRECISE, NOT PERFECT, JUST PRECISE"!

Take Care

### Manuals

When you find an error in your manual, please call Jeff at the Factory. Jeff will review your input with Scott, correct the master version, and issue a KPC for all builders to benefit. If we all work together as a team, we all win! Thanks...

# Buying / Selling an Experimental Aircraft

by Rick Lavoie

Whether you are looking to buy or sell a Velocity, the first question is always "What's it worth?" There is no easy answer to this question due to the many variables of an experimental homebuilt aircraft. But there are some common sense guidelines that you can use that apply to buying just about anything, from a residential home to an experimental airplane.

Professional appraisers use two methods in determining the value of a residence. They use both the "market value approach" and the "cost replacement approach" to determine the value.

The market value approach looks for properties, called "comps", of similar type, etc. The three most comparable are then used to determine the value of the home they are appraising. Adjustments are made for minor differences. This method of appraisal is based on what the market will pay or a "supply and demand" approach. Another words, what is a comparable Velocity selling for these days. With a Velocity, the hard part of the formula is "comparable" due to the many variables of a homebuilt.

The other appraisal method is called the "cost replacement approach". To relate this to a Velocity, you would itemize the out-of-pocket cost for materials (kit cost, engine and avionics cost), and a reasonable cost of your time (labor) to build. Duane feels that twenty to twenty five thousand dollars is a reasonable cost to use for your labor.

You would want to look at both of these methods in determining a fair price for a Velocity. In the end your Velocity will only sell for what a buyer is willing to pay at that point in time!

Factors that you need to list and assess are:

- Quality of workmanship
- Which model Velocity
- Engine, accessories, condition & compression, & time SMOH
- Avionics and Instrumentation
- Paint and interior

- Aircraft age and overall condition  
I find that the best way to understand something, is to work at a few examples:

1) Velocity N123456

- Good quality workmanship
- Standard fixed gear, old wings with LE cuffs installed
- 400 hours SMOH on 180 hp, fuel injected Lycoming, good compression and condition
- Average avionics
- Paint is hot pink (limited appeal)
- Interior is average
- Aircraft is average condition

This model Velocity sold for \$55,000. The major negatives were the old wing, pink paint job, & small engine. Supply and demand ultimately reduced this price to what a buyer was willing to pay. The negatives limited the number of potential buyers.

Let's look at another example:

2) Velocity N654321

- Average workmanship
- Standard RG
- Lycoming 200 hp, Fuel injected, electronic ignition w/ 1 Slick mag, 350 hours SMOH, good compression and condition
- Full IFR panel, Strikfinder, auto pilot, nice workmanship on canted panel.
- Paint is white with nice trim. Good condition for both Paint job and interior
- Two year old aircraft (since first flight) and the overall condition is very good.

This model might sell for \$130,000. If it had been an Elite model, it might sell for \$10-15,000 more (based on the lack of supply of finished Elites). This same aircraft might sell for many thousands less if the quality of workmanship were poor.

Although there is no "blue book" to value a Velocity, you can see that a fair and reasonable value can be set with a bit of research (get some "comps"), and reviewing costs and current values. Some very basic pricing guidelines (given with extreme caution) are as follows:

- Fixed gear price range \$50-90m

- RG price range \$90-135m
- Add for Elite +\$10-15m

The AOPA booklet "The Kitplane/ Homebuilt Alternative", has a checklist and lots of valuable information on this subject. It is a must for anyone that intends to buy or sell a homebuilt airplane.

## Best places to advertise a Velocity for Sale (or look to buy one):

- Trade A Plane
  - EAA's Sport Aviation Magazine
  - Kitplane Magazine
  - Velocity Views Newsletter
- These are probably your best bet, but others may work as well.

Showing your Velocity "for sale" at an EAA fly-in (Sun n Fun, OSH), also will bring good results.

## Get it in writing!

If you are considering buying or selling an experimental aircraft, you need to call AOPA and request their booklet called "The Kitplane/ Homebuilt Alternative". It is 28 pages loaded with info to help you buy or sell that homebuilt. EAA also has a one page sheet called "Suggested Checklist for the sale of a homebuilt or restored aircraft". Both are free to members. If you are not a member of EAA or AOPA, see page 7 of Volume 1 for info on how to join both organizations. They both suggest some language that your attorney can include in a bill of sale that can help with the issue of liability. Although no document can eliminate liability, having one seems to be of some benefit.

The page to the right contains legal language compiled from both AOPA's & EAA's information. Both AOPA & EAA advise that you consult an attorney to properly draft your document. The following is meant to be only an example. The publisher and author disclaims any liability for its use. It has not been prepared or approved by an attorney!



**SAMPLE BILL OF SALE & HOLD-HARMLESS LANGUAGE**  
**Amateur-built Experimental Category Aircraft**

John P Seller, residing at 267 Homebuilt Dr., Sebastian Florida ("Seller"), in consideration of the sum of One Hundred and Ten Thousand Dollars (\$110,000.00) from Peter Buyer., located at 322 Terminal Road, Georgetown South Carolina ("Buyer"), receipt acknowledged, hereby sells, transfers and conveys the following aircraft:

Velocity RG, Serial number DMO xxx, Aircraft FAA Registration number Nxxxx,  
Engine IO360-C1E6 Serial number L-44555-95

Seller warrants to Buyer the following: (i) Seller is the owner of the Aircraft; (ii) Seller has the legal right to sell the Aircraft; (iii) the Aircraft is free and clear of all liens and encumbrances and (iv) Seller will defend title of the Aircraft against any claim or demand except any lienholder disclosed in this Bill of Sale.

Disclosed Lienholder(s): none

BUYER UNDERSTANDS THAT HE IS BUYING AN AMATEUR BUILT EXPERIMENTAL CATEGORY AIRCRAFT REGISTERED AS SUCH WITH THE FAA AS INDICATED BY THE AIRWORTHINESS CERTIFICATE. THE BUYER UNDERSTANDS THAT THE AIRCRAFT WAS BUILT BY AN AMATEUR (John P. Seller) AND THAT ONLY THE GENERAL QUALITY OF THE WORKMANSHIP AND NOT THE DESIGN HAS BEEN APPROVED BY THE FAA.

BUYER HAS EXAMINED OR HAS HAD AN OPPORTUNITY TO EXAMINE THE AIRCRAFT. SELLER HAS RECOMMENDED TO THE BUYER THAT A LICENSED INSPECTOR EXAMINE THE AIRCRAFT TO CONDUCT A "PRE-BUY" INSPECTION.

SELLER HAS EXPLAINED THE LIMITATIONS OF THE AIRCRAFT TO BUYER, INCLUDING THE FOLLOWING PARTICULAR DANGERS AND SPECIAL REQUIREMENTS IN ITS OPERATION:

- THE VELOCITY IS A VERY FAST & AERODYNAMICALLY CLEAN (low drag) SPORT TYPE AIRCRAFT WHICH IS DIFFERENT FROM STANDARD / NON-CANARD TYPE AIRCRAFT. THIS AIRCRAFT WILL GAIN SPEED AT A RAPID RATE IN A DIVE DUE TO ITS CLEAN LOW DRAG DESIGN. A CANARD PLANE IS DIFFERENT AND REQUIRES A DIFFERENT TECHNIQUE FOR TAKE OFF AND LANDING.

BUYER REPRESENTS THAT HE IS CAPABLE & COMPETENT OF FLYING THIS TYPE OF AIRPLANE (CANARD TYPE DESIGN VELOCITY) AND IF NOT, WILL SEEK DUAL INSTRUCTION IF CURRENT LOGGED TIME IN THIS TYPE AIRCRAFT IS INSUFFICIENT.

BUYER AGREES THAT THE SELLER SHALL NOT BE LIABLE FOR ANY DAMAGES OF ANY KIND ARISING OUT OF SELLER'S OWNERSHIP OF THE AIRCRAFT.

THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION OF THIS AIRCRAFT ON THE FACE HEREOF. BUYER TAKES THIS AIRCRAFT AS IT IS AND WITH ALL FAULTS AND WITHOUT ANY WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OTHER WARRANTY, WHETHER EXPRESS OR IMPLIED. NEITHER THE LOGBOOK OR THE CERTIFICATE OF AIRWORTHINESS OR ANY OTHER WRITTEN OR ORAL STATEMENT IS INTENDED BY SELLER AS A WARRANTY OF THE AIRWORTHINESS OR OTHER QUALITY OR CAPABILITIES OF THIS AIRCRAFT. THE SELLER DISCLAIMS THE ACCURACY OF ANY MAINTENANCE RECORDS, OTHER THAN THOSE DURING THE TIME OF OWNERSHIP BY THE SELLER. THE BUYER AGREES TO DEFEND AND INDEMNIFY THE SELLER FOR LOSSES OCCURRING OUT OF THE SUBSEQUENT OPERATIONS OF THE AIRCRAFT.

This bill of sale and hold-harmless agreement shall be governed under the laws of the State of xxx xxxxxx. This agreement shall not be modified except by an instrument in writing agreed to by both the Seller and the Buyer. Both the Buyer and the Seller are of legal age and under no disability.

Agreed and accepted this date by both the Seller and the Buyer:

Dated, Signed by both buyer & seller, Witnessed and Notarized

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# Builders Forum

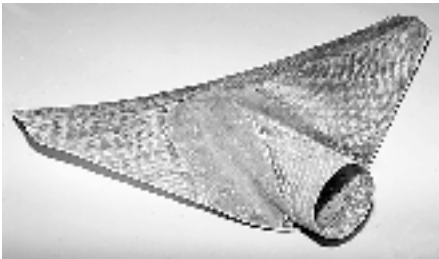
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From Dave Black, Woodbridge Virginia

## Molded Defroster, Prop Extension Cover Flange, & Wing Pin

Here are three cases where we used the molding capabilities of fiberglass to create precisely-matching parts.

### Defroster



*Defroster Vent ready for installation.*

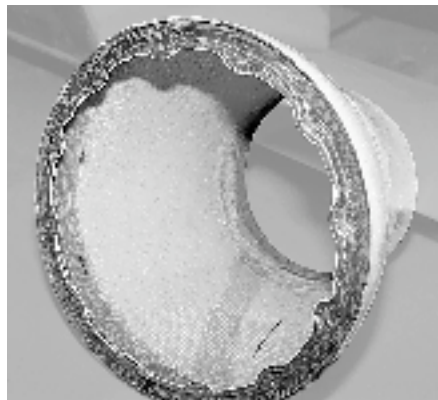
The Velocity plans do not call for a defroster. But we thought it would be a good idea to have one. Our concept was to build something resembling a vacuum-cleaner nozzle. To build it we put release tape in the area under the windshield where the defroster would go, then laid up 1-Triax in that area. Once cured, we pulled it out and attached a cylindrical fiberglass hose fitting (made from more Triax), then trimmed it to its final shape. Next we spaced the piece 1/4" down from the fuselage



*Defroster Vent in position*

inner skin, and glassed it in place. The defroster connects to the hot air supply just aft of the oil cooler via a second flapper valve. Both the defroster and cabin heater flapper valves, by the way, were molded to fit the duct sides they would cover. Thus when they are closed, the flappers seal tightly to prevent heat leaking into the cabin.

### Prop Extension Cover flange



*Prop Extension Cover with contoured mounting flange*

Plans call for the Prop Extension Cover to be mounted to the alternator/starter ring with silicone only. Apparently this works fine, but we were concerned it might vibrate loose, so devised a stronger method. First we waxed the ring to prevent resin sticking. Then with the extension cover in place against the ring, we molded a 2BID fiberglass flange onto the ring. The completed flange conforms exactly to all the bumps and holes in the ring and will allow for screw-mounting the Prop Extension or could provide a sturdier surface for silicone adhesion.

### Wing locating pin in strake-tip

Some countries require locating pins to tie the wing leading-edge to the strake. The US does not, but it seems like an excellent idea. We considered a half-dozen methods for

constructing the desired pins before hitting on a solution resembling Beechcraft's fix for the Bonanza's stabilators. With the wings precisely in



*Wing locating pin in strake-tip*



*Close-up of molded wing-pin*



*Lily-Bob relaxes near wing-pin. Tie-down ring is out of position to facilitate sanding*

place and before the strake tops were installed, we molded these pins to fit inside the tape-released leading edge of the wings. The bottom of the pins tie firmly to the bottom strake. Once the strake tops were installed and the wings removed, we completed the pins by glassing them firmly to the strake top as well. The pins will certainly add strength to the wings, and actually help during wing installation and removal. In any case, we should have no worries during turbulence or high-G maneuvers.

I welcome comments or questions at (703)590-2221 or asterisk@idsonline.com .

Happy building.

••••••

*From Jim Agnew, Tampa FL*

### Oil Line Alternative

For those of you thinking about an alternative to the aluminum oil lines, following is some research done by Dennis Martin, Simon Aegerter, and myself. The prices are a benchmark you might want to use in your research.

The prices and some recommendations came from Bill Hippy at Amazon Hose & Rubber in Tampa, FL. (813) 223-7554. Bill is very knowledgeable about any type of hose and fittings including AN and they have about 40' of shelving of AN fittings. They custom make hoses from small medical to huge dredging lines so they know what they are doing and have all of the correct equipment to manufacture the lines.

Per a Velocity builder that I know and trust (Fred Kerfoot), oil cooler to Engine bulkhead is about 11 1/2' + about 2-2 1/2' to the engine fittings. Your mileage may vary!!

The quoted price was \$4.35 per foot for the tubing and either \$3.09 for brass or \$10.68 for SS fittings installed. Bill recommended SS at least at the engine side and FAA recommends steel. Fittings are 37 degree #8 flare fitting (also called JIC type fitting) or pipe.

Here are the specs:

OD is .54 inches (just over 1/2 inch)

ID is .42 Wall thickness is .12 inches (1/8 inch), Working PSI is 2000 PSI, Minimum burst pressure is 8,000 PSI, Fahrenheit Temperature ranges: 100 degrees below zero to a sizzling 450 degrees, Minimum bend radius is 5.25 inches to make a 90 degree bend, Rating for pressurized hot oil applications is "Excellent" on a rating, scale that goes from Fair to Good to Excellent.

Bill did recommend that we put Firesleeve on the engine side of the lines when assembled, probably about 2-3' for each line.

••••••

*From Dean Tipa and Ricardo Price*

### Electronics Supplies Info for Homebuilders

An easy way of getting electrical or electronic components is to call "Newark Electronics" and request a free catalog. Newark is one of the largest electronic products distributors in the world. To receive their 1450 page catalog, call 1-800-463-9275.

*Dean Tipa*

Two other parts houses you might mention are Mouser Electronics at (800)346-6873 and Digi-Key at (800)344-4539. All of these suppliers (Newark, Mouser, and Digi-Key) are happy to supply free catalogs. To give some price comparisons, consider the following:

7805 +5VDC Voltage Regulator (TO-220 package):

Wicks	\$2.25
Radio Shack	\$1.49
Mouser	\$0.53

Black Lacing Cord (500 Yards):

Wicks	\$20.83
Gulf Coast	\$24.00
Mouser	\$17.87

Antenna Connectors (UG89)

Wicks	\$2.50
Gulf Coast	\$3.00
Mouser	\$1.91

In addition to price, these parts suppliers have new technology parts that would work well in experimen-

tals and aren't found in aircraft parts catalogs. The push-push CB is a perfect example. Other good examples include high-brightness LEDs that make perfect cockpit indicator lights (and almost never burn out) and a wide variety of switches.

On a separate note, I am the owner of Simplify which makes voice warning systems (see Sep. '96 Kitplanes magazine). One of my systems has been flying in Duane's Elite for about a year now and, so far as I know, has been working very well for him.

*Rick Price*

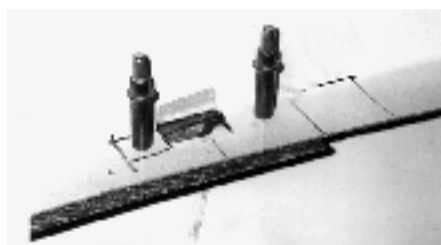
*Internet e-mail: HornetBall@aol.com*

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*From Bill Wade, Unity, Me*

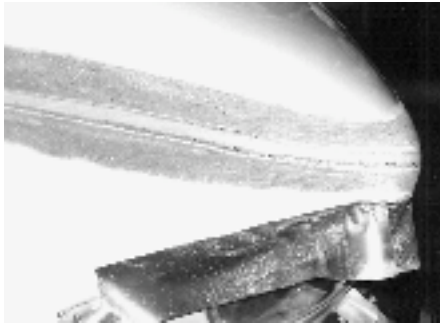
### Mating Fuselage Halves

I recently put the top on my plane and the method worked well for me So I thought I'd pass it along. Early on in construction I mated the two halves by cutting notches in the flanges at several points along the sides and filing until the sides were flat. This allowed me to align the top and bottom accurately. Once the parts were aligned I drilled for 1/8" Clecos as needed.



When installing windows and doors I was able to put the top in place and allow the resin to cure in its final position. I believe this will result in less internal stress and avoids the possibility that the top might not match the bottom by the





time everything is done.

The original notches were all the way through the flanges. When it came time to join the halves I realized that cutting a 'window' would serve the same purpose and still leave the outer edge of the flange intact. This maintains the curvature and stiffness of the edge. Cutouts were not very difficult to do with both halves in place I used a hacksaw blade snipped to a point at one end. This allowed piercing cuts, and the inner sides were then filed until they seemed to be flush with the profile of the fuselage. I ended up doing them about every 9".

I used a microglass/ floc mixture with one coarse and one fine BID for the inside joints, including the nose area. When it was set I trimmed the flanges and sanded them smooth. This left a thin, even layer of micro in the nose gap and elsewhere along the fuselage which provided a good base for the outer tapeglass.

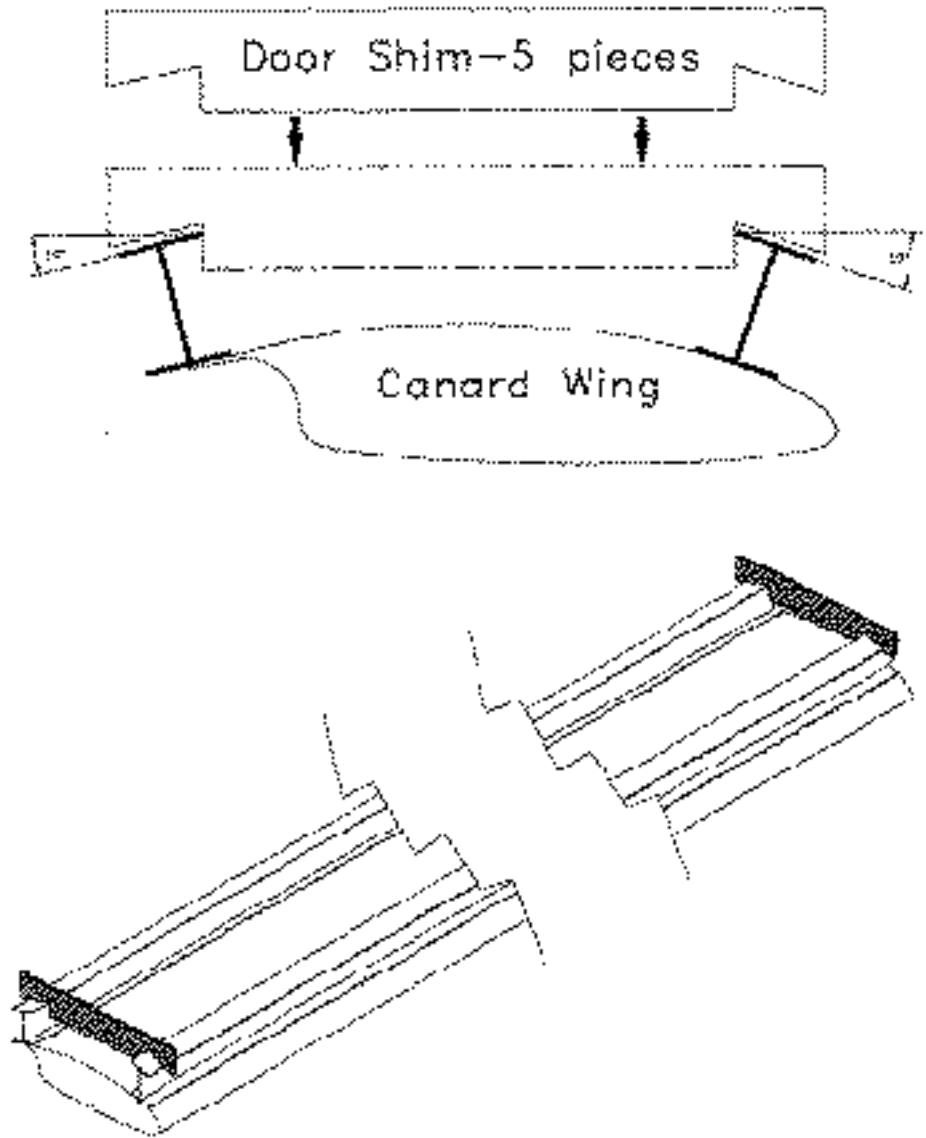


*From Dale Alexander, San Bruno CA*  
**Canard Straight Edge Tips**

Here are the details of the canard spar straight edge spacers that allowed me to keep the straight edges parallel to each other and ease the truing process of the canard.

I glued the leading edge straight edge to the canard in the proper place called out in the manual. This was easy to do as the foam core is very rigid in that location. Locating and gluing the TE straight edge was quite a bit more difficult. The first attempt was not very successful and I had to remove it after the 5-minute epoxy had cured. This of course damaged the trailing edge and was somewhat problematical to repair.

I pondered what I could do to



rectify the problem when the idea that a simple jig would do. I laid the second straight edge along its approximate place on the canard and measured the distance between the two and recorded the angles with my digital angle gauge. I went to the computer and drafted the distance and angles on AutoCad and plotted a full scale diagram. I cut out the angles and used it as a gauge to cut five templates out of the door shims that I have been using to shim assemblies for true (see diagram above).

I then glued all five to the leading edge straight edge with 5-minute epoxy. when it had fully cured, I slid the other straight edge in place on the trailing edge and under the shims that were glued to the leading edge straight edge. I applied 5-minute

epoxy to the trailing edge straight edge and the shims and allowed the assembly to cure. When that was finished, I slightly lifted the trailing edge straight edge and applied 5-minute epoxy between the straight edge and the foam core and let it cure (see diagram above).

I checked everything for tolerances and found that the straight edges were now parallel to within .040" and the ends of the canard were within 0.1 degree.

The distances and angles shown in the diagram are approximations.

I was having some problems with the canard lay-ups #3 and #4 which are the Uni layers. I would epoxy the first of the Uni layers and then try to add the second layer (#4) directly on

top. In the process of trying to align the #4 layer, I noticed that the first Uni layer was moving around and getting out of proper position. I tried everything that I could think of to save the assembly, but the #4 layer would pull the #3 layer every time I tried to make an adjustment. Finally, I had to abort the #4 layer and removed it.

I was remembering all the things that other builders had told me such as laying out Uni layers and preimpregnating them with epoxy and then transferring the Uni to the work piece, but this works best for much smaller pieces. I then hit upon the idea of letting the #3 layer set-up until it was nice and tacky. It would be very resistant to moving and would still accept epoxy quite readily. The temp during the day here has been 55-60 degrees so that decision alone allowed me to go in and finish a good book!

When the epoxy was just right (after about 6 hours) I took some 4 mil plastic sheet and placed it on the canard, covering everything but 1" to 2" of the top trailing edge where the #4 Uni layer begins. I then placed a new piece of Uni onto the plastic covering the canard and matched the edge of the Uni with the trailing edge. When this was accomplished, I pressed down firmly on the Uni starting a bond between it and the epoxy exposed on the trailing edge. I reached under the plastic and began sliding it back 4 inches at a time and then pressing down on the Uni. Just think of the process of applying decals and you will have a very good idea of what I was doing. By using this technique, I was able to make adjustments to the Uni before it came into contact (and sticking) with the epoxy resulting in a very straight lay-up.

I also found with the #3 lay-up that working from the center outward with the epoxy and alternating side to side perhaps 1 1-2' at a time gave the best and straightest finished lay-ups.

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## Factory Information

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Fax: 561-589-1893  
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<http://www.velocityaircraft.com>  
E-mail address:  
102714.2757@compuserve.com

### West Coast Service Center:

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Lincoln CA 95648  
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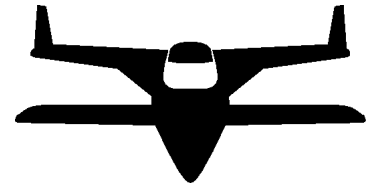
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## FOR SALE Tipover Cradle

Used to turn your Velocity over during construction of the strakes. I also kept my plane inverted for a number of other things like finish & primer. Yes this is the one built and designed by Dave Black (see Volume 6 page 12 for photos & article on Dave's "TOC"). \$50 plus you need to pick it up in St. Augustine FL (too big to ship). Call Rick Lavoie 904-461-3146 or [lavoie@aug.com](mailto:lavoie@aug.com)

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*Velocity Views*  
is published **Quarterly** by:  
**Lavoie Graphics**  
**26 Marshview Dr**  
**St. Augustine, FL 32084-5873**  
Rick Lavoie, Publisher  
904-461-3146 (voice or fax)  
lavoie@aug.com

*Velocity Views* newsletter is published in cooperation with Velocity Inc. (the factory). Prior to printing, the factory reviews each volume published for accuracy.

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