

VELOCITY VIEWS

Volume 30

The Velocity Branson Fly-in

by Sue & Lynn Elsner



Lynn Elsner proud builder of his Standard Velocity RG, is the organizer for the Velocity Branson Fly-in

October 11-13, 2002

If you haven't marked your calendar for the Branson, Missouri fly-in October 11-13, 2002....do it now!!! This is a busy time down in the Ozark country and things fill up fast, so **make your reservations pronto.**

We have reserved a block of rooms at the beautiful Radisson Hotel (on the strip), close to restaurants, shops and shows (some even walking distance). The Radisson has a full service restaurant and cafe, an indoor/outdoor pool, sauna, jacuzzi and exercise room. The room rates are \$82 and they need to know if you

want to stay longer than the 2 nights. They will also book shows for you over the phone and give you all the information you might need. Tell them you are with the Velocity Flyers. Phone 888-566-5290 for room reservations. Dial the same number and then extension 178 for the concierge to help with show tickets. They will take reservations up to September 18th.

Some popular shows in the area are the Shoji Tabuchi Show (a Japanese musician) an outstanding show full of talent, Andy Williams, Bobby Vinton, Jim Stafford, etc. are

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Branson Fly-in

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close by and the Grand Palace has different entertainers during the year. We are giving you some web sites to check out the show of your choice as well as other hotels in the area that are close to the Radisson.

Of course Silver Dollar City is a major attraction worth seeing, just plan on most of the day.

www.radisson-hotel-branson.com
www.bransonsshows.com

Hampton Inn 417-334-6500
Green Gables Inn 417-336-3400
Peachtree Inn 417-335-5900
Baymore Inn 417-336-6161

The above are listed in case you call after the deadline and the Radisson is full, or if you want to stay somewhere else.

We have planned a **cookout** at the airport in Branson, Point Look Out (PLK) on Saturday.

Let's make this a great Velocity Weekend whether your plane is flying yet or not!

Let me hear from you at:
lynsuelsner@webtv.net
Lynn and Sue Elsner
25834 S. Cedarcrest Dr.
Sun Lakes, Az. 85248
480-895-9680 or after May 15th call
402-826-5493 in Nebraska

Branson is located on beautiful Table Rock lake. It is becoming one of the leading entertainment centers of the United States. There's plenty for everyone with great names in the entertainment from the Passion Play to Silver Dollar City The airport is Point Look Out PLK, which is just a few miles from everything. The weather is great this time of the year.

Volunteers will be needed for things like:

* ground transportation (for those flying in) i.e. driving vans/ cars between airport, hotel, & events...



- * welcoming attendees at airport
- * cookout setup/ cleanup

About Branson:

Branson is a unique combination of neon and nature where the stars in the theaters are as luminescent as the stars in the expansive night sky. Entertainment in Branson means enjoying a world-class show and landing a trophy sized catch, sinking a birdie putt and viewing the bald eagles that come to nest on the towering bluffs. Screaming in delight while racing

along a roller coaster track and biking through the rolling hills of the Ozarks. This remarkable vacation destination is truly an American original. A place where kids, parents and grandparents can all enjoy vacationing together. Forty magnificent theaters, three spectacular lakes, twelve championship golf courses, three remarkable theme parks, dozens of family entertainment centers, hundreds of restaurants and lodging facilities ... all conveniently located in America's heartland.

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Velocity Views Subscription Rate Increase & Some Changes...

by Rick Lavoie

Many thanks to the countless supporters of Velocity Views. Special thanks to those who have renewed prior to December 15th and renewed by check! The many supportive letters and notes I receive from you each year are much appreciated. You are the reason I continue to publish the newsletters.

On the other side...

Occasionally Duane encounters a builder who does not subscribe to the newsletter. When asked why, some complain that the \$35 per year renewal fee is too costly for a quarterly newsletter. In addition, no matter how much I remind and request that payments be made by check and by Dec 15th, a huge number of subscribers don't do so. Renewing on time and paying by check greatly helps keep my administrative time for processing renewals efficient. Of 533 subscribers from 2001, only 328 renewed on time (in my hands by December 30th). This means that over 200 will renew late for 2002 subscriptions, requiring extra work for me to process each late renewal individually and manually.

Publishing Velocity Views is a labor of love. I'm not doing it for the money, because I'm not making money doing it. After paying the out-of-pocket costs (printing, postage, credit card fees, etc.), dividing the hours I spend on processing renewals and subscriptions, phone calls, e mails, editing, pre-press production, labeling, stamping, and more, I'm being paid very little for my time. Many times I've also had the time and expense of printing, labeling

and mailing "reminder postcards" to those who haven't renewed on time. If I was not spending all this time on the newsletter, I would be devoting it to my graphics and consulting business, billing at a good hourly rate.

So to those few who have complained about the cost of the newsletter, I question where can you get a more informative, pertinent, timely newsletter at a more reasonable price? And for those who don't renew on time or by check, I feel it necessary to adjust the subscription rates. I have struggled with how to compensate for the extra work this generates while not penalizing those who honor my renewal policy routinely. So....

No more Reminder Postcards will be mailed

I place several renewal notices within the 3rd and 4th quarter issues. Each 4th quarter issue has a full page renewal invoice notice. Subscription expiration dates appear on every mailing label. I consider this enough reminder for every subscriber.

Thanks for your understanding and I hope you continue to enjoy Velocity Views.

Subscription Rates:

- \$45 subscriptions to USA addresses (was \$35)
- \$50 subscriptions to International addresses (was \$43)

Renewals:

- \$35 ONLY for renewals:
 - paid by check (in US funds) and
 - check is mailed by Dec 15th each year

So, if you mail your subscription renewal by Dec 15th and pay by check (US funds)... the annual cost for renewal will be \$35.

Also, you can pre-pay as many future years as you choose at the \$35 rate.

If you renew after Dec 15th or renew with a credit card, then you will be charged at the "subscription rates" (\$45 or \$50).

Back Issues

\$35 per calendar year.

Check the last page of your newsletter. Look at the mailing label for "Paid Thru Vol" to see when your subscription expires.

Central States Assoc. SPRING FLY-IN ELLSWORTH KS, APRIL 26, 27, 28.

EAA chapter 1127 is hosting the CSA Spring Fly-In in Ellsworth, Kansas April 26 thru 28th.

For more information contact Kerry Woods:
email: kewoods@ellsworth.net or call 785-472-4113

What is CSA? refer back to: Vol 26, page 9



Insurance Issues:

In Velocity Views # 29, I ask for some response about the possibility of forming a co-op of Velocity builders/flyers, to address the ever-increasing cost of insurance on our airplanes. I had hoped that participation by a large portion of our flying population would allow us to self insure for hull damage. I only received feedback from a few people. Perhaps you have not been impacted yet with this insurance issue and it is pre-mature to look at a problem that may not yet have surfaced for you. I'll leave the door open for your comments and suggestions for the future.

I have been concerned for some time about the possibility of Avemco pulling out of the high performance aircraft market due to the high claims they have suffered. This concern is now a fact as Jim Lauerman, Avemco VP, just e-mailed me with the news that Avemco will not write any NEW insurance on any high performance aircraft including the Velocity. Only existing policyholders will be considered in the future. He indicated Avemco will continue to issue builders insurance even on new applicants. I pointed up the fact that the only claim for Velocity in the almost 3 years we have had the inspection and training requirements was a recent \$4000 claim for a door that departed an aircraft because the pilot forgot to latch this door. (Claim payment subject to deductible limits) The following is Jim's response.

"Duane, you are correct that the only Velocity loss we had since the inspection and training requirements were imposed, was the unlatched door. While we had not had a long enough time to develop

large numbers to analyze, the inspections and training had certainly stopped the hemorrhaging of red ink that we had experienced in the past. The Velocity got caught up in the broad sweep of relatively poor results in high value and high performance homebuilt aircraft. When the analysis gets to the levels above me, some of the finer nuances get buried. If anything should change regarding this decision I will, of course, advise you. I genuinely appreciate the effort you have put into improving our results on the Velocities, even though I realize that they were in your own best interests. As I have said before, I think you have had a much broader vision and more responsible attitude than many of your competitors in the high performance homebuilt industry."

If you are looking for insurance I would suggest contacting the following:
Falcon Insurance 1-800-880-4545
attn: John Allen. One of the companies they represent is Aerospace Aviation Managers
AUA Insurance 1-800-727-3823 attn: Pam
Aircraft and Marine Insurance 1-800-747-1124 attn: Kevin Gruys

There are probably others insurance companies out there and if you are using a company not listed, let us know so we can include them.

More On The Door Opening Issue

We have designed a new gas strut installation procedure that pulls the door shut. Once the door is about half way up, the gas strut reverses direction and pushes the door open. The mechanical advantage of the strut is very positive in holding the

door open AND SHUT and WILL PREVENT THE DOOR FROM OPENING in the event the pilot forgets to latch the door prior to take-off. The new gas strut and hardware to install are available now for all those who want to take advantage of this improved version. As an added benefit, the reverse pressure in closing totally eliminates the twisting created by the old strut system. We have flown the new strut system on our aircraft without latching the pilot door and found the door stays in the closed position throughout all the speed ranges. The cost of the new strut, instructions and hardware is \$20 per door. If your airplane is already upholstered, add another \$5 per door for the lower ball support bracket. It will attach to the carbon beam over the upholstery rather than potting it into the beam. You will use the existing upper door bracket but it will be moved to another location.

Business Offer:

From the feedback I received from you from Velocity Views # 29, it is apparent that breaking down the company for Velocity builders to become Velocity owners is just not going to work. The response I got was too small in numbers to consider this direction. We are looking at other possibilities for my eminent retirement and will keep you informed as we continue the search.

Continental IO 550 310 horsepower Velocity XL RG

Sonny Eymann is now flying his Continental powered XL and is finding this engine/airframe combination to be ideal for him. Sonny had previously owned a Cessna twin with the big Continental engines and already knew the engines to be reliable. The 550 is about 40 lbs. heavier than the 260 Lycomings but on the positive side, is about 30 lbs. lighter than the 300 horse Lycoming. Sonny has reported speeds close to 200 knot at 10,000 feet density altitude on about 65% power. Cylinder and oil temper-

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Factory News

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atures have been reportedly fine. As with any new engine installation, we have had to go through some learning curves and changes that will make things easier and safer for those of you who decide to go with this big engine. As an example, we have completely re-designed the exhaust system to minimize cracking. On the Continental, we have eliminated all welds with the exception of the flanges that attach the exhaust to the cylinders. Time will tell if this works out OK. We have another 550 about ready to fly here in the Service Center and will be able to make comparisons with the 260. If this engine is something you might be interested in, let Scott Baker know. We have been given OEM status with Continental and can sell this engine new for not much more than an overhauled Lycoming IO540 (300). The Continental comes complete with a 70 amp alternator, starter, oil cooler, mags and fuel system. We will be trying the new Fadec system on another Velocity to

see if the reduced workload is worth the price. This system eliminates the need for a mixture control and provides a high-energy ignition system with an automatic advance for better efficiency.

Service Center Changes

Our Service Center is ever growing and we need to make some changes to better handle the many who want to use this program. At the present time we have twelve airplanes scattered all over our building and it is getting difficult to even walk around. We are going to group specific building processes, like wing strakes, engine installation, elevator/offset torque tube installation, wiring etc. and will require all who are building in the Service Center to use our technical assistance for these specific tasks. Our technical people will be doing all the work in this area and it will be done with a fixed fee rather than an hourly rate. The \$50 hourly rate will still apply for builder support where necessary. We will continue charging \$150 per

week when the builder is working in the Service Center and \$100 per week when the airplane is here for storage only. This will help keep the projects moving to completion faster and free up valuable space for the new guys.

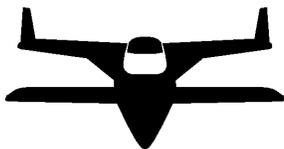
Branson Fly-In

It looks like the Branson MO Fly-In will be one of our best ever as many of you have already made plans to attend this event on October 11-13 2002. Please see the special announcement on page 1 of this issue and let Lynn Elsner know if you can attend and further if you are willing to help. I just talked to a fellow yesterday who just returned from Branson and he said it was the most enjoyable week he has had in a long time. It might be that many of you will want to stay a couple more days to take in even more sights than the three days will allow. I look forward to seeing many of my old friends in Branson.

New Projects

Due to the heavy workload in the Service Center we have not had a lot of time to devote to our twin project. In addition we are starting work on our own XL RG Continental 550 model. This airplane will be used for demo's, the air show circuit and as a final transition aircraft in our training fleet. Initial training will be done in our standard fuselage fixed gear model and those who have an XL will receive the additional training in our new model.

We have retired our fixed gear XL and are making a static display out of it for Sun-N-Fun and Oshkosh. This airplane was damaged in a tornado like wind sheer training accident and we decided it would be easier for us to convert it to the static display and spend the time building a new retract model with the Continental rather than a re-build of the fixed gear. We have found that the damage to our aircraft with hundreds of people constantly climbing



May 4, 2002 Factory Open House Workshop Schedule

Saturday May 4, 2002 - 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

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Factory News

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in and out is just not acceptable. The static model will allow this without the worry.

The picture below shows our newest project we call "HELP"

This stands for Human Elevator & Lunatic Projectile. I guess one picture is worth a thousand words.

Gross weight with Lunatic = 700 lbs. (Velocity is 2700 lbs.)

Power to weight ratio is 2.7 lbs. per horse. (Velocity is 10.4 lbs. per horse)

Wing (prop) loading = 120 lbs. per sq. foot. (Velocity is 18 lbs. per sq. ft.)

No other information available at press time.



Yes, that is Scott in the Lunatic seat.

Nall Report

Each year I give you some summations gleaned from reading the Nall report on aircraft accidents. You can be sure that the insurance companies read these reports also and make decisions based on what is reported.

The latest report covers the year 1999 and is a reflection of what the trends are for 2000, 2001 and so on. General aviation has been improving since 1994 in both the number of accidents and fatalities. The greatest change, however, has been in the number of deaths caused by the stall/spin in the experimental field. Last year (1998

report) I mentioned that the stall/spin for general aviation (excluding experimental) was 26% while the experimental was at 37%. That is, 37% of the deaths in the experimental fleet were caused by the stall/spin. For 1999 general aviation remained about the same at 28% whereas the experimental fleet has elevated to an astonishing 57%. What is also important is that over 28% of all experimental aircraft accidents result in a death while only 18% of general aviation result in a death. Although the Nall report does not distinguish between high performance and low performance aircraft, I believe we all can see where the increases are coming from. Pilots with low performance experience flying high performance airplanes. Who would have ever guessed ten years ago that someday you could build a pressurized, turboprop, 375 mph airplane in your garage! Remember, neither a complex or high performance endorsement is required under the experimental rules. If you were in the aircraft insurance business, would you want to insure a 100 hour private pilot in one of these aircraft? Would you want to insure a high performance experimental airplane knowing these statistics? We all know that the Velocity is not part of this 57% but the insurance companies honestly don't know and really don't care.

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Please check your mailing label on the last page to see when your NEWSLETTER subscription expires...

"Paid Thru Vol xx" indicates the last issue you are paid through. Also, You can pre-pay for as many future years as you'd like Please renew today! See the last page for details

Thanks!



REFLECTIONS

by Duane Swing

Every once in a while I get the urge to set down and write about some of my experiences after many years and the almost 9000 hours (and counting) of flying general aviation aircraft. There are probably many of you who have a lot more logged time than this but I will bet it would probably be as a military, charter or airline pilot. All of my time is flying around the country in my own airplane for pleasure or business or ferrying someone else's airplane for any number of reasons. As I look at my logbooks (all five) I immediately remember things that happened that have made that indelible impression on my mind that might be worth your reading. Perhaps you will get a kick out of some of these episodes, any one of which I could write a whole chapter. If you find this just plane boring, let me know and I will find other ways to pass away the time.

In 1955 I joined the Air Force so I could "see the world." At least this was what I had been told. Four years later I was still where I started, in a windowless building on a remote corner of an air force base in Louisiana making maps. Really exciting stuff this Air Force. (I can't believe it takes me only two sentences to cover four years of my life.)

By 1962 my passion for aviation got the best of me and I purchased the plans for a Bensen Gyrocopter out of Mechanics Illustrated. It took me

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about 5 months to build it and I flew this creation for a couple years before selling it and about everything else I owned to fund my first year of college. Back then; there was no GI bill that would pay for education. I was self-taught in the Gyro and never took a flying lesson until later.

My real flying started in early 1964 when Bill Doty, my first CFI, signed me off for solo in a Purdue University owned Cessna 140 with less than 6 hours dual in my log book. He never told me to stay in the pattern so I ventured out into the countryside and spent the next 1 1/2 hour flying around scarred to death that I would die trying to land this thing. I eventually got it on the ground without killing myself or anybody else but Bill was nowhere to be found and, as I was to find out later, Bill was so sure I had bought the farm that he never again worked as a CFI and left Purdue the very next day to fly co-pilot in his dad's Loadstar. In 1988 I found Bill setting under the wing of a Stearman at Oshkosh and re-introduced myself to him. He told me he had mistaken me for one of his other students and thought I had about 15 or 20 hours of time already logged. Once he realized he had signed off the wrong student, he thought he had killed me and gave up being a CFI forever.

In an attempt to keep my flying cost at a minimum, I became the president of the flying club at Purdue and was given 3 hours of flight time per month for my services. I found an instructor who was looking for help in math and chemistry and traded my time for his. In total, I remember spending about \$200 to get my Private license. This was about \$200 more than I could afford. Francis Halsmer issued my license on September 18, 1965. Francis was an early EAA member and had built and flown his own designed aerocar. It was featured in an EAA publication in early 1960. As I remember it, he flew the airplane to Rockford where the EAA fly-in was held back then, and preceded to drive all

around town in the "car" part of his homebuilt.

While a student at Purdue, I talked my dad into buying a wrecked Tri-Pacer so I could use my A & P license to rebuild the airplane to pay for my tuition, an expensive wife, (Bonnie) and our three little kids. I also was working full time as a mechanic for a friend who maintained a dozen or so aircraft and as a part time lab instructor in the Purdue jet engine lab. On June 13, 1966 with a week off for spring break, I flew the re-built Tri-Pacer, with Bonnie, sons Rick and Scott and our daughter Kelly, from Purdue (Lafayette, Indiana) to Portland Maine with no com or nav radio. I had crossed the com/nav antenna wires by mistake and had about a two-mile range on both. Even when the old Narco Mark I was working perfect, it only had about a 10 miles range. This was my first long x-country and required a weather delay in Bennington Vermont according to my logbook entry. I found out from this early beginning, that the most enjoyable part of a lot of our trips was the un-expected. Bennington is a ski resort area and at that time of year lots of things were going on to attract the summer vacationer.

Between 1965 and 1968 I managed to check out in a Cessna 120, Cessna 140, Cessna 150, Cessna 172, Cessna 182, Cessna 210, Cardinal, Ercoupe, Alon A2A, T-Craft, Citabria, J-3 Cub, Tri-Pacer, Cherokee 140, Cherokee 180, Cherokee Arrow, Cherokee 6, Navion, Mooney, Comanche 180 and a Comanche 260. I put about 350 hours in the company owned Comanche 260 before buying my second airplane, a Comanche 180 in November 1968. By now I had logged over 500 hours. I flew this airplane until June 1969 when I purchased my third airplane a 1961 Comanche 250. I flew this airplane all over the country on both business and pleasure and had logged an additional 400 hours in 14 months.

By now I was ready for my commercial license and I see I took the ride

on January 10th 1970. I also noticed in my logbook an entry dated January 20, 1969 with a notation about the filming of the movie Airport. I was stranded in Minneapolis Minnesota on a business trip for five days during a blizzard and a crew from Hollywood was on hand for the filming of the original Airport movie. If you remember, a jet taxied off the runway into the mud during a blizzard and there was a mad scramble to remove it by using a bulldozer to make room for the crippled jet making the final approach to the same runway.

I see another entry on November 14th, 1970 with a notation "Amana, close call." I was on my way to Amana Iowa on a business trip. Suddenly an approaching King Air flying about 50 feet below and to the rear and on a converging course startled me. He passed directly below me and I noticed an enroute IFR chart plastered against the pilot window to shield him from the afternoon sun. The interesting thing here is that the airplane was owned by the Amana Corporation and I knew both the airplane by the logo on the tail and the pilot/engineer who worked for Amana. The next day I scheduled a meeting with the pilot about an engineering problem we were having with an electrical harness we supplied to them. I ask him about flying with his chart in the window and he was shocked to find out how close we had come to a collision.

In March of 1970 I see an entry entitled "lake fog." I was returning from Milwaukee to Frankfort Indiana and was planning on flying my usual route around Chicago. The visibility was not all that great so I decided to fly down the center of Lake Michigan and cross over into Indiana around Valparaiso Indiana. On the way the ceilings kept going lower and lower until I was at about 100 feet above the water. Obviously I had no VOR navigation due to my altitude but kept moving south knowing at some

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Reflections

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point I would see the shoreline. Once reaching land the fog shot right down to the ground with zero visibility beyond. After skirting the shoreline for about 25 miles, I came across the Indiana State Dunes Park.

Fortunately it was too early in the spring for anyone to be parked in the parking lot. That is except for a Comanche, which fit in it quite well. I packed some snow around the wheels for chocks and left the airplane in the hands of the Park Ranger. I told him I had developed an oil leak and put the plane down as a safety measure. When I returned a few days later, the Park Ranger told me that the FAA had been on the property the day after I landed to investigate an airplane part that had washed ashore from a previous Lake Michigan crash. He said the FAA wanted to know why an airplane was sitting in the parking lot. He gave them the story about the oil leak, which must have satisfied them, as I never was called about it. I noticed an entry in my logbook that the following week I scheduled my first instrument training flight.

I finished my instrument training and passed the flight test on December 17th, 1970. The next day, I filed an instrument flight plan from Frankfort Indiana to Dayton Ohio. I guess I didn't want to get rusty. By now I had logged over 1300 hours. In April of 1971 I noticed an entry with the words St. Elmo's fire. This entry brings back a very vivid event that probably very few pilots will ever see. Bonnie and I (I think the three kids were in the back seat) were flying our Comanche back from visiting friends in Atlanta. I remember the time as being about 10:00 pm and pitch black. A hundred miles or so out of Atlanta we got into some rain that turned to light snow. Suddenly, without any warning, the tips of the prop lit up with fire spouting out from the very end. It looked like a huge bulls eye out in front of the airplane and lasted about five or six seconds. Not long, but long enough for

Bonnie to come up out of her seat and beat the tar out of me. This phenomenon was caused by static electricity building up on the airframe and dissipating through the prop tips. The prop tips became the static wicks seen on the trailing edges of a lot of larger airplanes.

By now, I was giving serious thought to a twin Comanche so in June, 1971, I purchased the first of what would ultimately be five of these very efficient twins. I picked up my multi-engine rating 10 days later and off to the races I went. Bonnie won't forget her first flight she had in the twin, again with three kids stuffed in the back seat. On climb out, Scott tapped me on the shoulder and pointed to the left engine, which had a stream of oil pouring out the back. No choice but to shut it down and head back. Her first landing in my pride and joy ended with one engine shut down and feathered. Not easy to justify the extra cost of a twin under these conditions. I flew this airplane all over the eastern U.S. as owner of my own manufacturing representative company. I later joined forces with a friend and flew both my twin and his Cessna 337 Skymaster. One interesting thing about this particular Skymaster was the high oil burn rate on the rear engine. My friend thought it much cheaper to just keep adding oil than overhauling the engine. Our long distance flights were limited by oil capacity rather than fuel.

I see an interesting entry in my logbook on 3-11-72. I was returning from Atlanta to Dayton Ohio in the Twin Comanche at about 10:30 PM. The weather was lousy with late winter snow and IFR conditions all along my route of flight. Somewhere in Tennessee, everything on the panel went blank. No com radios, no nav radios, no lights, no autopilot, nothing electrical was working at all. I remember flipping the master switch on and off seeing if perhaps the switch went south but still nothing. Fortunately the flight instruments were vacuum operated and they continued to work fine. On the

flight plan I had listed Louisville as my alternate but how does one find Louisville at night in a snowstorm with no com and no nav radios? Handhelds were only a dream back then. I remember noting my position when things shut down and calculated the time it would take me to reach Louisville and headed in the general direction. About 45 minutes out, and clear of any mountains, according to my calculations, I started a shallow descent. I remember breaking out at about 1000 feet and could clearly see Louisville, or at least I hoped it was Louisville. I circled the airport a couple times to see if I could get a green light but none came. After landing, I taxied to the closest FBO and called the tower to tell them what had happened. The next day I checked out the airplane and found the master solenoid that turns on and off everything electrical in the airplane had disconnected for some unknown reason. I had an airplane with two of everything except this solenoid. Makes one wonder why there aren't two of them also. In fact, when I got home, I installed a second solenoid just in case.

By August of 1972 I had just over 1600 hours logged when it was time for my second twin Comanche, this was a 1969 C model with the 6 seat interior. I paid just over \$20,000 for this 3 year-old airplane. My how times have changed. Total time on the airframe and engines was 1800 hours. I flew this airplane to 2300 hours before overhauling both engines and props. It might be interesting to note that at this time I was working as a manufactures rep and sales engineer for a large ball bearing company and one of my accounts was Prestolite. I supplied all the bearings for the Prestolite alternators used on trucks and airplanes. I purchased two new alternators from their Bay City Michigan plant for \$28.00 each. This was the same price Lycoming and Piper was paying for them. Piper wanted \$328.00 for this same alternator. (and you thought liability was a recent problem) I flew

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this airplane until the end of 1974 and averaged about 250 hours per year.

I noticed that on October 17, 1974 I began flying another Tri-Pacer that I had purchased from an insurance company and had re-built. I later converted it to a tail wheel Pacer when a friend "borrowed" my airplane and promptly folded the nose gear back on a bad landing. I flew this airplane off and on for two more years.

By early 1975, I had added two more employees to my company and purchased a Cherokee Arrow for additional sales coverage. I find one interesting entry for this Arrow. On February 1975 the remarks say, "stuck in the snow." Boy do I remember this event. I was pulling the airplane out of a snow-covered hangar at 6:00 in the morning and slipped on the ice and fell on my back. The airplane, however, continued to roll toward me and the nose wheel ran right up between my legs onto my coat, pinning me under the wheel. I couldn't push the airplane back due to the slope and couldn't get the coat off. I lay on my back for almost an hour in 20-degree cold until someone showed up and pushed the airplane off me. Flying can be harmful to your health.

By March of this same year I got tired of the Arrow and traded it in for my first new airplane, a Commander 112. Great airplane with gobs of room but toooooo slow. In October I sold the Commander and purchased a used Piper Aztec. By now I had logged about 2300 hours. About this time I also noticed I had rented a Piper Cherokee in Hawaii and spent an entire day cruising the different islands including flying down into a volcano in Maui, flying over the grave of Charles Lindbergh and re-tracing the Tora Tora attack on Pearl Harbor. On the north shore of Oahu I spotted a hang glider at about 7000 feet above the ocean. He had followed the mountain wave right on up the side and was at least 2000 feet above the ridge. There is

probably no greater way to see Hawaii than by private aircraft.

We kept the Aztec for a couple more years and supplemented it with a Bellanca Super Viking in July 1976.

In August 1976 I see an entry labeled "gear problems." I was returning from a cross-country trip and when I put the gear down, nothing happened. I tried using the dump valve (just like the Velocity) but nothing would get the gear down. I decided to see if I could get to the pump motor and proceeded to remove the right seat and a wooden panel below the seat to get to the pump. What I found was the lever that activates the dump valve was broken at the hinge point. I remember fumbling in my flight bag until I found a large paper clip and used this to get to the dump valve on the pump. All the while I was flying the airplane in huge circles with our local radar controller clearing me of any traffic. Let it be known that I will do anything to prevent a gear up landing.

By December of 1976 I was in need of more room in the single engine airplane and sold the Bellanca and bought a brand new 1977 Cherokee Lance. I remember this purchase well as the price was exactly \$77,000 and came with the 6-place club seating, dual King 170's, ADF, transponder, autopilot and other options. I was flying over 350 hours per year by now and mixing up the flying with the Aztec, the Arrow, a Pacer and the Lance. A couple trips in the Aztec were interesting. One was a trip from Charleston SC to Dayton Ohio in March of 76. I had all 6 seats full and was IFR at 10,000 feet only a 100 feet or so above a solid cloud cover. It was almost midnight when I got to Dayton with icing reported in the clouds. (The Aztec had no de-ice boots) I requested holding 10,000 feet until established on the glide slope to Dayton International, elevation 800 feet. Almost immediately upon entering the clouds the windshield began icing up and by the time I had reached minimums, the windshield was completely iced over and I

couldn't see a thing. The only way I could land was to open the little pilot window and crab the airplane so I could see the runway through this little window and kick out of the crab just before touchdown. Once on the ground, I couldn't see to taxi until the tower sent a pickup out and guided me to my hangar. My oldest son Rick was one of my passengers and it was a trip he will not soon forget.

Another trip in the Aztec took me to Portland Maine for an open house of the ball bearing company. I took five of my best customers with me for the two-day event. When we were about to leave, one of the years worst "Noreasters" came through and blinding snow was shutting down airports all along our route of flight. We loaded up and departed just before things got really bad. The biggest problem was that a couple of my passengers had boozed it up pretty good the night before and about two hours after takeoff wanted me to land so they could relieve themselves. The nearest open airport was in Canton Ohio, about three hours flight from our present position. Needless to say, I had a couple really bloated customers to deal with. 100% of this flight was IFR in snow showers with an instrument approach to minimums in Canton. These things I tend to forget but the customers reminded me of this trip for years after. The Aztec was certainly not the fastest airplane but was a really great business tool.

By September 1977, with 3800 hours logged time, my need for speed got the best of me and I bought a 1976 turbocharged Aerostar 601A. This airplane took me all over the eastern US and Canada servicing my ball bearing accounts and allowed me to develop a new machine tool cutting fluid business. One of the best things about the Aerostar was the fantastic speed and range. I could count on 250 knots with a 6-hour endurance. All this, however, comes at a price. The Aerostar was, and is, an expen-

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Reflections

Continued from previous page

sive airplane to own and by September 1978 I traded it for a new turbocharged Bellanca.

The trade was a story in itself. The Bellanca dealer in Columbus Ohio, who was also the largest Chevy dealer in this city, had approached me. He said he needed a twin for his growing business and the Aerostar would suit him just fine. When I entered his gorgeous offices on the second floor of a large office complex on the airport, his blond 20 something secretary greeted me dressed in a very mini skirt and a see through blouse with NOTHING underneath. Very strange I thought, especially since most airplane dealerships were struggling just to survive. I figured the auto dealership was supporting his aviation habit and making money was not important. Three months later he was arrested for running a brothel in West Virginia and was using the Aerostar to run his clients round trip from Columbus to his "house of ill repute." He was later convicted and lost everything.

We still had the Aztec for back up and used it when customer travel was necessary. We also purchased another Piper Arrow for our salesman to use.

The Bellanca started showing metal in the oil filter from the first change. Repeated calls to Lycoming resulted in no action. I sent the oil filter element to Lycoming when I had 150 hours on the engine as proof of the metal I was making. Lycoming said that the problem was in the turbocharger and they would not warrantee this item as it was installed by Bellanca and not covered by the Lycoming warrantee. Belanca would not even talk to me about it other than say the problem was with Lycoming. I drafted a letter to Lycoming stating that in the event the engine were to fail resulting in my death or serious injury, a copy of this letter would be sent to my attor-

ney and he would go after Lycoming for a settlement. The next day I got a call from Lycoming asking if I could bring the airplane to the Lycoming plant for a look see. The following day I arrived and soon after the engine was removed and a new engine installed. The service manager told me they could not find a problem but thought it just good customer relations to put in a new engine. I found the mechanic who was doing the work and he told me they had found the front crankshaft bearing spinning with the crank instead of the crank spinning in the bearing. Just goes to show that you can count on your mechanic to tell you the truth.

Another problem I had with the Bellanca was static electricity build-up. Whenever I flew in snow or rain, the static buildup would completely destroy my communication ability. The factory sent me static wicks and Collins had all the radios and installation checked but no one could correct the problem. One particular trip was from Dayton Ohio to Winamac Indiana to pick up a customer. Soon after departure from Dayton in light snow showers, I lost all my communication. I made a no radio flight to my destination and completed an ADF approach and landing to this non-tower, non-controlled airport. As soon as the wheels touched, the radios came back to life but I was not able to contact center because I was on the ground. I had already filed a round robin IFR flight and was able to pick up my return clearance just after lift off and just before everything shut down again. The return was to Dayton International and I had to do a no radio IFR flight back to this airport, including an instrument approach with no communication whatsoever. I put the Bellanca up for sale the next day and sold it three weeks later to a doctor in Florida who promised to fly VFR only.

(To be continued)

Duane

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Builder Hints & Information

by Scott Swing

Elevator hinging and torque tube installation

First, you will locate the hinge locations just as the plans call for. Set the elevators into position flush with the end of the canard (use the end of the elevator that is flush with the tube). Mark the location of the hinges that will go onto the elevators by using the marks on the canard as a guide. It is not that important how the hinge is oriented but the hinge arm needs to be installed on the flange part of the bushing that is in the hinge. Install the hinges onto the elevators with adhesive, two rivets and the screw.

Temporarily put the hinge arms onto the hinges, put the elevators into position in the well, and mark the slots that you will cut into the canard. You may need to bend the hinges to get the arms to swing square. I make my slots about 1 1/4" long by 5/16" wide as far aft as I can make them. Don't grind through the trailing edge just right up against the glass. Don't worry about dimensions in this case because what we are looking for is the most chord we can get. This is determined by the elevator and how far aft we get the hinges. They will only go back so far. Be very careful cutting these slots on the hollow canard since you have three different layers of glass that you will go through. The slots need to go all the way to the top skin but not through it. Make sure that the hinge arms are not hanging up on a ledge inside. With the foam core canard you just take the foam out to the outside skin.

After you have cut the slots and cleaned them out, you can set the elevator with its arms down into position. Use a couple of 15" or so pieces

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Builder Hints and Information

Continued from previous page

of I beam (or other straight edges) spring clamped to the trailing edge of the elevator extending forward onto the bottom of the canard. Put a weight on the straight edge of the I beam to keep the elevators in the trailing position. Don't put the weight too far forward since this may cause a gap under the straight edge. This would be known as 0 degrees. Now you can see that the canard trailing edge is still longer than it needs to be - 11-7/8" to 12". Mark the trailing edge and cut it off so that the trailing edge of the canard is right under or slightly aft of the middle of the tubing. After that, you should grind the trailing edge thickness down to no more than 1/16" (preferably down to 1/32"). Taper that about 1/2" to 5/8" forward. You don't want the elevator to be way below the trailing edge. I then use a piece of sand paper or pieces of band saw blades as a spacer for the elevator instead tongue depressors. Tongue depressors are okay but they are a little thick. Usually .030 to .040 is enough to insure proper nose down travel of the elevator. This seems to set the elevator in a better position. You can always sand the gap to get a little more travel if you need it. At this point we confirm that both elevators are as far aft as possible and are at the same angle. You can sight down them as well. Sand the hinge arms where they extend down below the canard surface. Sometimes I will have to spring clamp the elevator at the ends to keep everything lined up and the spacing the same. This loads up the hinges a little but not enough to make any difference. When satisfied, you glue the hinges in. Remove them first, fill the hole with a mixture of Eze Pox and flox, then put the arms down into position and clean up the excess. Make sure the arms are all the way back and that the space between the elevator and the canard is consistent and the elevators are at the same angle. You can sight them or use an angle finder to ensure

they are the same then let cure.

After cure, remove all the stuff and prepare for the concentric torque tube installation.

Installing the concentric torque tube assembly

Find the center between the lift tabs to locate the center hinge location. Cut the slot for it. The slot will be a little wider than the others since this hinge arm is double thick. Using a string from the two inboard hinge arms through the center hinge to line it up, glue it in. You may have to use something in the slot to keep the center hinge from moving while curing.

Trim off the center hinge to install the center aluminum pivot bracket. You can use a string through the center to line up the bracket. Clamp it in place, drill and tap for the 1/4 X 28 screws.

Another method of installing the center hinge arm is to take both pieces (center hinge arm and center pivot) lay the center pivot upside down on the center hinge arm, center the pivot on the arm, clamp into position and mark the holes with a 1/4" drill bit, drill on through with a number 7 drill, remove the pivot bracket, flip it over, and mark the center hinge arm where you will need to cut it off. Cut it off then round it off a little if you need to in order to get the pivot bracket to lay flat when attached. Attach the pivot to the center hinge arm. You may have to countersink the threaded area a little since the taper of the screw may extend down into the threads a little. You have now made one piece out of two. You can now use a piece of 1" aluminum tube or wood dowel that would extend from both inboard hinge arms through that center pivot bracket. In this way, you can glue the center pivot into the canard then remove the center pivot from the arm to get the dowel or tube out. Here at the shop, we have made just such a tube that installs the center pivot.

With your elevators in the installed position, put your torque tubes in position against the center pivot to locate where to cut off your elevator torque tubes. Cut the elevator

torque tubes off at that point but leave the rest of the elevator or at least a couple of inches. This way, you can trim the elevator really close to fuselage later on.

Now slide each of the torque tube assemblies onto the elevators and slide them into position. If you are jamming together in the center you will have to trim a little more off the elevator torque tube so that you are not binding. When satisfied with the fit, rotate the concentric torque tube so it lines up in the center of the elevator pivot. Using some 5/16" nuts as spacers and a bolt through, you can lock the two concentrics together in the middle. With the elevators positioned as they were when the hinges were installed, and the concentrics lined up with the elevator pivots, clamp the center so it can't move and secure the elevators so they can't move. Mark and drill the holes for each elevator. Since you are drilling them bottom up, slide a piece of aluminum between the elevator and the canard so that you don't drill through the canard in the process. Also, start with a smaller drill bit so you get a good tight hole for the long screw. Have someone else help you keep the drill lined up as you go through. The holes should be about 3/8" away from the tab since the bushings are 3/4" long. When you install the counterweight arm and weight, we have not been notching the torque tube to fit it. Just install it on the end of the torque tube. Set the elevator to about 28 degrees nose up. With the canard upside down it would be trailing edge up. This gives you some room for the glass that holds the canard tip on. You should be able to put a spacer in the center of the canard for the center counterweight arms to hit so that it can be locked consistently at this position. We have been using the same screw we attached the concentric torque tubes to the elevators to attach the counterweight arms. Drill through the same way as before. All the holes will need to be countersunk before you hook it up. You can just notch the canard tip for the difference in the non-notched elevator torque tube.

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A&P Talk

by Brendan O'Riordan, CFII, A&P



Rudder and Brake Rigging

In the last Views I discussed rigging your aileron system to get the most travel out of it. This Views I will go through the brake and rudder system. In the rudder and brake system great care has to be taken that both the rudder and the brake reaches their full travel without hindering the operation of the other. Lets first start at the rudder.

Since most builders are now using the internal bell crank for their rudders this is what we will talk about. First off the flat side of the internal bell crank needs to be flat against the outside skin of both the rudder and the winglet. Next go ahead and have someone pull on the cable inside the wing root until the rudder bottoms out. Measure the distance from the trailing edge of the wing to the rudder. The maximum you can obtain in a properly rigged system is 4 inches. If you do not reach 4 inches what is happening is the bell crank is bottoming out on the nylaflo or the foam in the inside of the wing. You may need to remove some foam and clip back the nylaflo until 4 inches of travel is achieved. After you are able to get 4 inches of travel with a helper actuating the rudder from the wing root have them go into the airplane and push the pedal all the way to the floor. Now you want to make sure that as soon as the pedal is depressed you get movement at the rudder. If you do not you may have

to move to the next hole in the cable adjuster located in the wing root. Next you want to check that you are still getting 4 inches of travel. If you are not you may either be bottoming out on the brakes or the canard bulkhead. If you are hitting the canard bulkhead your rudder cables will need to be shortened and your pedals will need to move further from the bulkhead. If you are bottoming out on your brakes you may need to readjust your brakes or shorten your cable. The work done at the pedals for the rudder and the brakes have to be done together because changing one may affect the other.

Next we will make sure you are getting full brake. As you push on the rudder/brake pedal you should feel the brake start to actuate after 2 inches of rudder deflection at the rudder. Push the brakes all the way in and make sure you still have room between the back of the pedal and the canard bulkhead. If you don't there are a few things you can do. First you can remove the roll pin in your push tube assembly on the back of you pedals and roll out the push block on the master cylinder shaft. This will engage the brake sooner when the pedal is pushed. If you do this you may also have to go back and make sure your rudders still reach their full travel. One other way to achieve a similar result is to remove the AN3-10A bolt from the push tube assembly. Reinstall it with a couple of AN4 nuts over it inside the push tube assembly. This will also actuate your brakes sooner. You may opt to cut the back end off your pedals rather than re-rigging your pedals. This may also work but I find this to be the most time consuming with the least result.

Some have found that while re-rigging their pedal assembly that they cannot reach the desired position with their pedals because their push block and roll pin interfere with each other. The roll pin is inserted in the push tube to make sure that the push block does not come out of it leaving you without brakes. If you put a pedal stop on the side of the fuselage this will not allow the pedal to come out far

enough to allow the push block to come out of the push tube. If you do not like the idea of removing the roll pin out of your assembly you may trim the push block slightly. The push block is 5/8" long as they come from the factory. If you decide to trim the block do not trim it any shorter than 1/2". Any shorter and you may risk binding and galling in the push tube. Make sure your master cylinder shafts are in line with the attach point on the rudder pedals. The further the shafts are off the less your mechanical advantage. Improperly lined up master cylinder shafts will also put a side load on the shaft causing more wear and tear.

No pilot should need the importance of proper control deflections and good brakes. These are key elements in making sure your Velocity flies as well as the one you rode in at the factory.

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Frequently overlooked items

Since we have been doing insurance inspections here at the service center we have seen quite a few airplanes that have been flying for years come in with the same list of items that need to be fixed in order to comply. I wanted to let everyone know what they were so they could check there airplanes to make sure they have these items done.

1 Some form of fire sleeve on any oil or fuel line in the engine compartment. You also need to install fire sleeve on your aileron cables. This is required for all aileron cables no matter what the heat rating on them is. Any control cable that has a plastic casing should be covered in fire sleeve if it is in the engine compartment.

2 All flight or engine controls that are connected with a rod end need to have a safety washer installed. A safety washer is a large area washer that will keep the rod end from coming off of the control arm in the

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A&P Talk

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event of a rod end failure.

3 There needs to be some firewall protection. The minimum is the flame control fire resistant paint. Fiberfrax covered with a sheet of aluminum is better. The best installation is fiberfrax covered with a sheet of stainless steel.

4 No engine gauge sending unit can be mounted directly into the engine. All sending units need to be remotely located with a flexible line making the connection to the engine.

5 All fittings that are screwed into the engine need to be steel. No aluminum fittings.

6 Steel fittings that are screwed into the engine going to sending units need to have restricted flow in case of hose or sending unit failure. In our engine install kits the oil and fuel pressure fittings are welded shut and then have a small pinhole drilled in them.

7 Exhaust pipes need to have a safety cable on them. On the forward facing exhaust we run a hose clamp around the exhaust tube just inside the cowling. We nicopress a 1/16" cable to this clamp. We attach the other end to our engine mount using an adel clamp. Safety wire is not an acceptable alternative.

8 AD compliance. Even though you are flying an "Experimental" airplane with an "Experimental" engine most insurance companies require AD compliance on engines. This is just common sense. AD's are not issued unless there is a serious safety concern.

9 A gear warning horn on an RG attached to your throttle with a micro switch.

10 On an RG a hole needs to be drilled just under the nose gear over-center link so in the event you don't get a nose gear light you can check that the nose gear is down with a short stick.

11 Properly balanced control surfaces. You would be surprised at the number of flying Velocities that have control surfaces where the builder never took the time to balance them.

12 Proper control surface travel. Two inches of rudder travel before brake. At least four inches of rudder travel measured at the wings trailing edge. Two to two and a half inches of aileron travel both up and down. Twenty three degrees of up travel and 26 degrees of down travel (trailing edge) on the elevators.

13 Proper size cutout in keel for control stick. The cutout is supposed to act as a stop for your control stick. If you reach the full travel of a control surface and the stick hasn't touched the keel this needs to be fixed.

14 Secondary door locks and door unsafe lights on Velocities with "Elite" gull wing doors on both the pilot and copilot doors.

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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 151

Affects XLRG

Manual section 15.5.2

Date of change 3-12-02

There is a difference in the text and drawing having to do with the sump tank attach tabs. The verbiage is correct so change the drawing to show only 2" onto the tank. This makes the pads 3" X 4" instead of 3" X 6". It is not necessary to have that much contact area with the tab.

Notes:

1. Do not use copper fuel or vent lines that are to be glassed into the tank. In time they will leak.
2. We have a new gas spring set up for the elite doors that seems to work much better. A few of our builders came up with it or at least different

variation on the basic method. Most of you already know about it. We will be testing the door in flight unlatched to see if it will stay closed. It will be retained just in case it starts to swing open. We will let you know the results. The new system actually puts quite a bit of pressure closing the door past about half way. We still expect pilots to close and latch doors as part of their responsibility.

3. DO NOT DRILL HOLES IN THE SPAR CAPS OF ANY OF YOUR SPARS. You can drill holes in the shear web but not in the caps. Your life depends on it.

4. The winglets finally came for the hollow wings. We are finishing up the installation instructions and a video so we can ship them out. We are doing as much here as possible so that those of you who have them will just have to glue, glass, and glue. We are very pleased with the quality and weight of the new winglets.

5. There was a question as to the aluminum backing plates in the ailerons. The plans clearly state at "each hinge location" but it is only mentioned once. We may change the plans and add at least one more mention of it later.

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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

PLEASE!

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

26 Marshview Drive
St. Augustine FL 32080
USA

Production News

by Scott Baker



Sales and deliveries of new Velocity aircraft kits continue at a steady pace. Folks who tour the factory are surprised to learn that we ship an average of 3.5 aircraft per month, and that over 550 Velocity aircraft have been sold and approximately 220 are now flying.

Our production team continues to dabble in small, yet innovative improvements to the kit – all of which help make things easier for the builder. Our fastbuild elevators are now made of molded parts using vacuum bag construction. Also, the canard spars now run the full length of the canard wing (the outboard sections of the canard wing were made of foam in the past).

Value Added Options Added to Basic Kit

All Velocity aircraft ordered after January 1, 2002 will have added features included in the basic kit. These include the landing light kit, the low fuel warning system, and door “unsafe” warning system. Plastic locking fuel caps will come as standard equipment. Also, for XL models only, adjustable rear seat rails will come with the package.

Price Alert

We have known for some time that the small, metal “eyeball” air vents made by Wemac were going up in price. It seems that the last of the reasonably priced supply of these vents have dried up. These little fellows now cost over \$159 each – which has caused Velocity to discontinue carrying them for resell. Our

advice is to buy these vents at the various fly-markets across the country, presuming you can find them! The metal vents should clean up well with a little spit and polish.

Aircraft vacuum systems are next on the apparent “hit” list. The typical vacuum regulator has gone up in price to \$285 ... and is expected to go higher! We are informed that the price for this unit will go as high as \$400 in the near future.

Heated Pitot tubes have risen from \$154 to \$259 each.

“Outrageous” is the only word I have for these price increases.

Continental Engines Look to be Popular Choice for Velocity XL
Sonny Eymann of Key West, Florida built the first Velocity XL model with the new 310 hp Continental IO-550N2B engine – and he is quite impressed with the speed and performance of his new aircraft. Since December, 6 more customers have selected Continental engines – and John Cervini, who lives in south Florida has selected the FADEC system for his soon to be delivered engine. The new Velocity Factory Demo XL-RG aircraft will also feature the FADEC system, which stands for Full Authority Digital Engine Control. FADEC presently adds about \$7,750 to the cost of the standard engine.

Velocity sells the Continental engine with a Premium 3-Year Parts and Labor Warranty. It is priced “right” and represents an outstanding value when comparing new engine prices in the 300 hp class. The Continental engine comes with a 70-amp alternator and built-in oil cooler, which are extra items on Lycoming engines.

New Generation Aircraft Preview
Velocity attended an interesting program held in Scottsdale, Arizona recently called the New Generation Aircraft Preview. Hosted by the Scottsdale Aviation Business Journal, about 16 “futuristic” aircraft companies, including Velocity, Inc.,

were invited to display their products first to a select group of several hundred invitees on a Friday afternoon, and then to the general public on Saturday. Lynn and Sue Elsner graciously allowed Velocity, Inc. to display their beautifully built Standard-RG (the Elsner’s have a home near Chandler, AZ). Many thanks go to Lynn and Sue for their enthusiastic support throughout the program in answering questions about their aircraft and Velocity, Inc.

Kitplanes Magazine

Kitplanes wants to feature your (and your aircraft’s) photograph following your first flight. You have worked hard and deserve some recognition! Send a short paragraph of your success story along with your photograph to:

“Completions”

8745 Aero Drive, Suite 105
San Diego, CA 92123

February Velocity Open House a Success

Each quarter Velocity, Inc. and Velocity Service Center, Inc. host an Open House on a Saturday morning. The February 2nd Open House brought beautiful Florida sunshine for the 60+ guests that attended the program. Demo flights were conducted throughout the morning, along with several Factory tours. Program speakers were Scott Baker, who spoke about Composite Safety; Brendan O’Riordan, who spoke on basic shop equipment and tool needs; and Scott Swing, who talked and demonstrated the “How to get Started” work steps when beginning from a Fastbuild Fuselage. The next Open House is scheduled for Saturday, May 4th. Hope to see you there!

Oshkosh Dinner

The Velocity Oshkosh Dinner is scheduled on the opening day of AirVenture 2002, Tuesday, July 23rd. We are excited to host this year’s dinner on the Kitty Hawk Deck on top of the Hilton Garden Inn in Oshkosh, WI. The Kitty Hawk Deck overlooks

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Production News

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the touchdown zone of Runway 09 (we all can judge the landings during social hour, which begins at 6:30 PM). Dinner is served at 7PM. The Hilton has promised alternate dinner seating accommodations if the weather turns sour. The Hilton, by the way, is within walking distance of the campgrounds and aircraft camping areas. Stay tuned for more details on menu selection and dinner costs. These will be posted to the Velocity web page in the near future.

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Electric Buzz...

by Wayne Lanza



In this issue of the 'views' I would like to offer a few tips on wiring, wire selection and avoidable problems. The following content is product of practical experience after wiring many aircraft. Straight forward wiring techniques have repeatedly proven to be more reliable and serviceable. Multiple power bus systems and non standard components are easily rationalized but are, in the end, less reliable, more expensive, heavier and can be difficult to debug. Let's get down to basics here...

WIRE SELECTION:

We recommend using only MS22759 wire for all power and ground a system in an aircraft; if a wire needs to be shielded we use MS27500. House wire, welding cable, marine wire all conduct electricity but are not recommended for ANY power wiring in an aircraft. This stuff is cheap compared to MS wire but if you really consider the difference in cost and weight vs. the mil spec stuff, it's worth the extra money. WHY? You ask...

The out gas from vinyl wire is very poisonous and makes lots of smoke, the insulation also melts really well and will melt adjacent insulation causing more and more problems. The MS wire is plated, has finer strands, uses tefzel insulation (tough stuff!) and does not have the smoke and out gas problems of the low temp vinyl insulation. The selection of wire gauge is subject to two basic parameters, how much current will it have to carry and how long it will be. The longer the wire, the higher it's resistance will be, the voltage drop across this resistance will lower the voltage at the far end and heat up the wire. The heat will increase as the load increases. A couple of useful tools here will be an electric wire chart found in the standard technical manuals and exposure to Ohm's law. I recommend getting a copy of EA-43 and refer to chapter 11, section 3. Shielded wire should be used for 'noisy' circuits like magneto 'P' leads and the strobe power supply. It is often recommended for use on the alternator field and alternator output wiring. We have successfully wired many aircraft without the alternator shielding and have had no noise problems; this has been attributed to ample ground capacity through out the aircraft.

AVOIDABLE PROBLEMS:

Consider that PAIN=MONEY and that some of us have a higher threshold of pain than others. Now if you are really smart, you will seek out those with the highest threshold of pain and learn from their mistakes. I'd like to relate some painful experiences that we have seen.

- Used electrical parts- Many regard

used parts as a real steal until half the stuff is found to be inoperative or craps out within the first few hours.

- Non standard components- Many builders use automotive or marine parts in their birds as an inexpensive alternative to the aviation parts. Consider starters, many of us, myself included have opted for a lighter weight starter and have installed an automotive unit. Is this bad, heck no! they are lighter, cost less and in their lives start your car thousands of times. But if you need to replace it and the field at Podunk just so happens to not have an auto supply near by, yer stuck!
- Simple things like wire terminations and tools is one of my pet peaves. If you buy the wrong connectors and use the wrong tools then you can expect problems. We have seen it repeatedly! I'm not trying to sell you anything but am compelled to stress that the small difference in time and money to do the job right is worth every bit of extra.
- Priorities- Too many are worried about the instrument panel and after the sticker shock from the avionics shop has subsided, decide to be frugal in other areas. This is classic, put a bunch of stuff in the panel that you don't need right away or don't know how to really use and opt for used spark plugs in an engine with no log books! We have one in the shop like this for inspection, what a mess...

We have many resources to draw on for guidance and reference, why ignore the obvious to save a little time or a few bucks? The adage that "You only get what you pay for" need be considered. If a deal is too good to pass up, find out why.

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Builders

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Designing a Velocity Panel

from Richard Gwinn of San Diego CA

When the time came for me to plan, design a build a panel for the Velocity XL-RG, I found that I had no idea how to begin. Now that I had a chance to do it my way, I did not want to repeat the errors that I had lived with during my flying career, but it took a lot more thinking and research than I anticipated. I thought it might be helpful to other builders to describe the thought process that went into my panel and some of the things I learned along this interesting path.

An instrument panel is a highly personal matter, and you might go through the same process and come to very different conclusions. However, I discovered that there are some rules that should be respected, and some things that need to be considered. One of the people I asked about how to design a panel replied, "Oh, you just get a graphics program like Panel Planner, put everything you want on the panel, and then arrange it until it looks good." This did not strike me as very good advice, but it is in fact how some people have gone about it!

Among the things that should be considered include your budget (of course), personal preferences, space available, projected use of the aircraft, capabilities you want or need, unique characteristics of the aircraft and resale value. Options for an experimental aircraft are almost unlimited. You can have anything from a very basic VFR panel to an Electronic Flight Information System (EFIS) that rivals the space shuttle. Some builders may design a panel primarily for appearance, with exotic materials and complex workmanship. My desire was to have a panel



that was cost effective, businesslike, and sensible but had sufficient capability for serious cross-country travel.

STANDARD INSTRUMENTATION VS EFIS

Everyone likes high-tech, and there are plenty of options for the experimental builder. These range from Sierra Flight Systems' synthetic vision capability and Blue Mountain Avionics' EFIS under \$10,000, to individual avionics components like the Meggitt Integrated Cockpit and the Sandel electronic HSI. I like these goodies as well as the next person, but my background in software, electronics and computers, as well as my previous flying experience causes me to pause and consider some potential problems. For one thing, most of these systems are not certified. Whether or not this matters depends upon what you plan to use them for, and what else you have on your panel. However, it does have some limitations that need to be carefully considered in light of the FAA regulations and your intended use. Second, small entrepreneurial companies build these low-cost leading-edge systems. It is the nature of such companies that many of them will not be around several years

from now. If you invest your entire budget in an electronic panel, you could find yourself replacing it all in a few years because of lack of ongoing software support or repair capabilities. And what about when your horizon stops working in Oops, Utah? You think the local avionics tech is going to fix it for you? However, my main concern about these systems is the presence of failure mechanisms that can take out your entire capability. In particular, an electrical failure will take it out for sure, and certain failures of the display or main processor can turn all that information to rubbish. Yes, they are quite reliable, and many of them are partially redundant, but they are not triple-redundant voting systems like the space shuttle. If you have never had simultaneous failure of redundant systems in an aircraft - well, you just don't have enough hours yet. The only acceptable approach, in my opinion, is to have complete redundancy with standard instruments and to consider the EFIS as nice, but not something you have to depend upon, and that raises serious cost and space issues. For these reasons, I opted not to use these systems on my aircraft.

CHARACTERISTICS OF THE

VELOCITY THAT AFFECT PANEL DESIGN

The Velocity is flown from the left seat, using the right hand on the flight controls and the left hand on the engine controls. This is different from the usual design, where the flight controls are usually operated with the left hand and the engine controls with the right hand. In order to be flown from the right seat, a standard aircraft needs another set of flight controls, whereas a Velocity needs another set of engine controls. This affects the layout of the items on the panel. One of the first decisions you should make is whether or not you are going to include a duplicate set of engine controls, or perhaps only a throttle, on the right side of the panel. My thinking was that my aircraft will not normally be flown from the right seat or used for training, and in an emergency, a pilot in the right seat can reach the engine controls, although it would be awkward. Therefore I opted not to do this to avoid the extra weight and complexity.

Another important characteristic of the Velocity is the space available. The panel benefits from the fact that there is no yoke sticking out of it, obscuring the line of sight, but you must be careful about the space BEHIND the panel. Many builders have gotten into trouble by not considering this. For example, the popular UPS Avionics stack will NOT fit in many airplanes (without extensive modifications) if the audio panel is placed at the top of the stack (as is customary), but it will fit if the display is placed on top, because the back of the display has a sloping enclosure. Also, the popular JPI EDM-700 will not go willingly into a hole at the top of the panel because of its length. I recommend that you fit the panel and make careful measurements of the space available behind it before you begin to lay out the instruments.

DIGITAL VS ANALOG INSTRUMENTS

Digital and analog instruments have different characteristics that make them suitable for different

tasks. Of course, they look cool, and since they are relatively inexpensive, many builders stack arrays of them on their panel. Tests have shown that an analog instrument is easier to scan and remember, because it brings into play both numeric data and pattern recognition (What was that number again?). Also, you can more easily see a rate of change on an analog instrument (how fast the indicator is moving). Like the EFIS, digital instruments can sustain a simultaneous global failure with failure of the electrical system. Of course, analog instruments can fail too, and many of them are electrical as well, but the probability of mass failure is somewhat less. A more insidious problem with stacks of digital displays is that they all look alike (Was that the fuel pressure or the oil pressure?) which can lead to mistakes. For my panel, I opted to use analog instruments for manifold pressure and RPM, and digital instruments for fuel quantity and pressures.

INSTRUMENT ARRANGEMENT

The arrangement of the instruments on the panel should be governed by three factors: convention, utility and safety. The arrangement of the basic flight instruments is familiar to all pilots from their earliest training, and to tamper with this arrangement is to invite problems. Yes, you can get used to it, but what about the next pilot who flies this airplane? Having a nonstandard arrangement of the basic six slight instruments is not, in my opinion a good idea. Utility has to do with the function of the items. Things that you have to look at, like the artificial horizon, should be placed where they are easily SEEN. Things you have to manipulate, such as switches, should be placed where they are easily REACHED. Another aspect of utility is the order in which things are used. Look at your checklist. Do not put item 1 on the extreme left, item 2 on the extreme right, and item 3 on the floor! Do not put the landing gear switch where you can only reach it by taking your hand off the flight controls. Don't put important

or emergency switches controls out of sight or out of reach. Do not put groupings of more than 5 similar items (gauges or switches) together. Think about it - if you have to grope for something in the dark, you can identify the 3rd switch in a 5-switch grouping. Can you reliably, in turbulence, identify the 7th switch in a 12-switch grouping? No, you can't. I had to do it once, and take my word for it, under some situations, you can't! Above all, do not put dangerous things next to routine things. Do not put the mag switch next to the landing light. Do not put a fuel shut off knob next to an identical cabin heat knob.

MY CONCLUSIONS FOR MY PANEL

Based on the principles outlined here, I will describe the design of my panel. Based on the same principles, your decisions will be different. But I would urge you to consider the factors discussed here in your panel design. Don't just "arrange it so it looks good." Think about why you are putting something where it is, and make sure you have a good reason for it being there as opposed to somewhere else.

I selected the UPS stack for its functionality, design and price, and arranged it so that it would fit in the Velocity panel, with the display on the top. I arranged the basic flight instruments in the conventional pattern. I chose a Century HSI instead of a simple DG because it eliminates the need for an omni head and frees up space. Also, I am used to having an HIS, and prepared (reluctantly) to write the check. I grouped the engine instruments together, but the RPM and manifold pressure are analog and the rest are digital. That makes it easy to tell one from the other, and I think analog instruments are easier to use for the power functions. The left fuel quantity is on the left and the right fuel quantity is on the right, and the small digital gauges are at the top of the panel. The deeper EDM-700 is at the bottom, where it will fit.

The landing gear switch is locat-

Continued on next page

Builders Forum

Continued from previous page

ed where it can be moved with only a minimal departure of the left hand from the engine controls. The warning lights are right in front of my face, and all together, and there are LOTS of them. If there is ANY warning indication, I will see it. I opted for a separate EDM-700 and FS-450 fuel flow monitor, even though fuel flow could be added to the EDM-700, because this way you don't have to push buttons and scroll through menus to get the information and you can monitor more things at once. The autopilot is right below the DG so the information can be easily compared. The clock is with the flight instruments, in case I have to do a timed approach, not on the right panel where parallax becomes a problem. The vertical card compass is faired into the to of the glare shield, not in the panel where the magnetic fields may disrupt the meter movements of other instruments.

The switches are in small groups where I can find them by feel alone and operate them with either hand. I don't care for the standard arrangement of switches in the overhead panel of the Velocity. I have left the starter, master and mag switches there, since they are normally used only at the beginning and end of a flight, but I have changed the switches to blunt rockers that will not leave distinctive scars if I hit my head on it during turbulence. I have moved the lighting switches onto the panel to avoid errors when reaching for the overhead switches.

The right side of the panel is a work in progress, but one idea might merit your consideration. The small rectangular drawer at the bottom is a multi-purpose media drawer, which locks out to serve as a desk, and where you can put (and connect) a laptop computer (maybe with an EFIS program?) or a portable DVD player. There will be connections to the audio system and perhaps to a back seat TFT display so the passengers can watch movies, but the device can be removed and used for

other purposes as well. Notice that if you arrange the breakers horizontally as shown, and you want to use the excellent Composite Design breaker panel, you will have to make a new face plate - the breakers are not symmetric and will not fit in the same face plate if they are turned 90 degrees as shown. On second thought, I think I will put mine back upright!

If you are interested in following the evolution and construction of my panel, check out my web site at <http://home.earthlink.net/~richardgwinn/>. My Email address is posted there, and I would be happy to hear from other builders and share ideas and experiences.

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Velocity Calendar

May 4, 2002 - Factory Open House and Workshop

July 10-14, 2002 Northwest EAA Fly-In, Arlington, Washington

July 23-29, 2002 EAA Oshkosh 2002, Oshkosh, Wisconsin

July 23, 2002 Velocity Dinner, Oshkosh, Wisconsin

August 3, 2002 - Factory Open House and Workshop

Sept. 6-8, 2002 EAA - Golden West Fly-In, Sacramento, CA

Sept 27-29, 2002 - CSA Rough River Fly-in, Kentucky

October 11-13, 2002 - Velocity Branson MI Fly-in (see article on page 9)

October 24-26, 2002 - AOPA Expo, Palm Springs CA

November 2, 2002 - Factory Open House and Workshop

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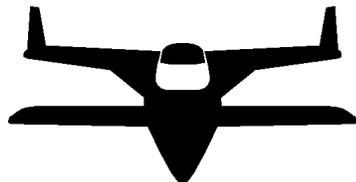
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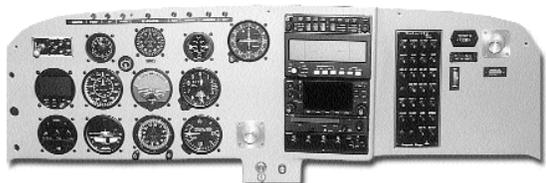
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