



# Arion Hangar Talk

The “Lightning” Newsletter

**March 2009 - Volume 2, Issue 3**



## **Bill Hubbard’s N316H– “Lightning of the Month”**

Please submit a photo of your Lightning for future “Lightning of the Month” consideration.

The goal of the newsletter remains **to get the word out** on happenings at Arion Aircraft, and **to give a voice** to Lightning builders and flyers. To be successful we will need the inputs from all of you in order to meet that goal. So it is not only a way for the factory to provide Lightning news, but it is your newsletter as well, and, as such, its success will depend on you getting involved to spread the word and to help other builders and / or flyers with their project airplanes. So think of this newsletter as an “exchange of information publication”. Send your inputs directly to me at: [N1BZRICH@AOL.COM](mailto:N1BZRICH@AOL.COM).

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**And now, the rest of the news.**

## Lead Stories:

Once again there are **two lead stories** for this issue of the Lightning Newsletter. First is a **Sebring Report** with photos provided by **Carl and Pat Beatrice**. By the time you are reading this, they should be well on their way to completing their new Lightning. Next is a very detailed report by **Jim Langley** on the **Odyssey EFIS display** that he used in his Lightning. Enjoy both articles, then let **Carl, Pat, and Jim** know how much you enjoyed their contributions to your newsletter.

### Sebring Report:



From EAA Photo Gallery, photo credit: Jim Koepnick

The **U.S. Sport Aviation Expo** at Sebring Regional Airport, Florida, is the place to be in late January each year if you are at all interested in Light Sport Aircraft. There you can see about every light sport aircraft, try them on for size, and probably get a demo flight. Of course, once you decide on which model best fits your "mission" you can buy one as well. Sebring is best described as a trade show for the rapidly maturing light-sport aircraft industry. As always, the 2009 Expo at Sebring was an excellent place for potential light sport owners to "kick the tires" and "light the fires". Pete and Nick have had the Jabiru and the Lightning aircraft on display at Sebring since this event started several years ago. What a great place to be in the middle of winter – airplanes, friendly people and warm weather.

The following photos from this year's Sebring were provided by **Carl and Pat Beatrice**. Thanks **Carl and Pat** for your effort to let us all "be there".



That is **Nick** standing beside his "steed" and telling potential customers all about the Lightning. The guy on the left is reaching into his pocket for a fist full of money.

This photo shows **Carl** standing by the demo Lightning and dreaming about his future first flight in his and **Pat's** "jet". That is **Pete** up front wondering why it is so cold in Florida.



They took a really nice looking SLSA Jabiru with them to Sebring. Red airplanes and red Corvettes rule.

To the right is **Pete** explaining the virtues of the Jabiru engine and being very thankful that the Florida weather finally warmed up. The guy on the right has a haircut like mine and is going to get a sunburn.



## To MGL or not to MGL? (Not even a question...) By Jim Langley

*MGL Avionics is the company that produces the Enigma and the Odyssey EFIS display units.*

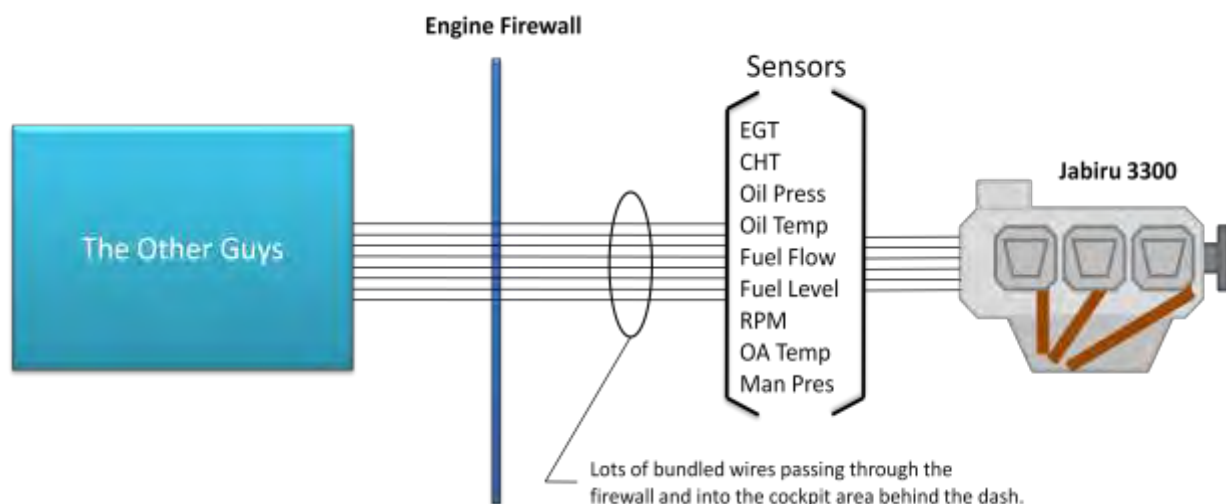
Most of you all have heard or read about my detailed search for the aircraft that I wanted to eventually build; basically a systematic and methodical approach of gathering facts and details to help with my choice. My background is engineering and information technology so I tend to make many of my decisions this way.

When it came time to outfit my panel with an EFIS, it was natural that I would look for something that was similar to what I worked with every day. First I created a list of minimal "wants" which looked like the following:

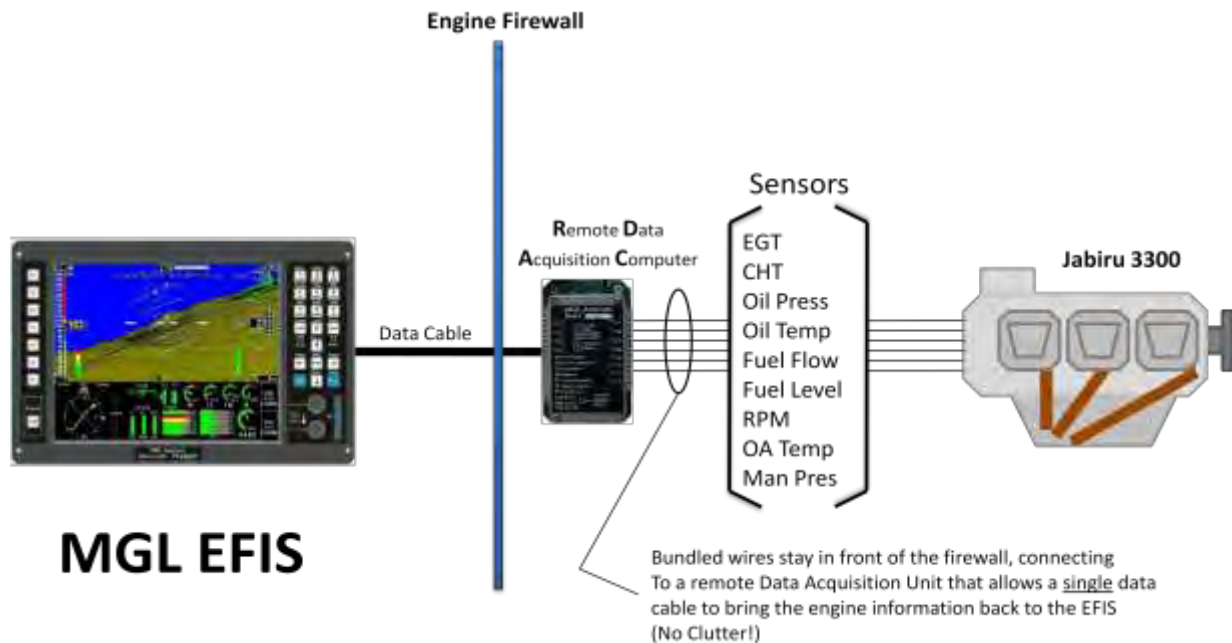
- GPS with moving map
- Engine Monitoring
- Attitude/Heading Reference System (AHRS)
- I/O and External Device Control
- User Programmability
- Removable Storage
- PC Connectivity

It was pretty natural for me then to become attracted to the products that MGL, ([www.mglavionics.com](http://www.mglavionics.com)), had to offer. Their line of EFIS products offer a computerized, flexible, user friendly, well thought out design as well as being very affordable. They sell three versions, the 5.7" Enigma, 8.4" Voyager and 10.4" Odyssey. I also was looking for something that would help to eliminate the panel wiring clutter that I have seen in many of the installations that I looked at. The MGL utilizes a modular design that greatly reduces the number of wires that you need to run through the firewall; in fact for a normal installation, a data cable and power is all you need!

If you look at a normal EFIS installation, (diagram below), you will notice that all of the sensor wiring is routed back to the EFIS through the firewall. If you have 20 sensors, then you will have at least 20 pairs of wires running back through and into your cockpit space behind your panel.



The MGL setup utilizes a Remote Data Acquisition Computer, (RDAC), as a centralized hub for all sensor wiring. The RDAC connects to the EFIS by a single data cable. This allows you to keep the sensor wiring completely on the outside of the firewall, and minimizes the connections behind your panel.

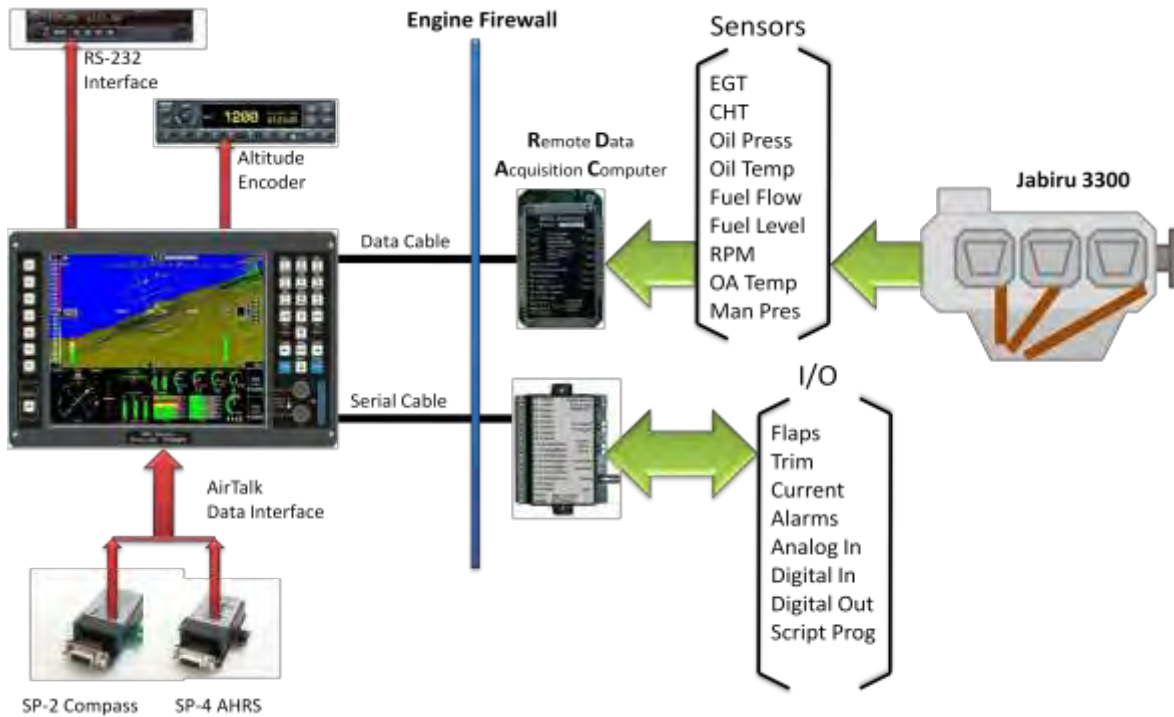


The MGL EFIS provides primary flight navigation with built in moving map GPS and comprehensive engine monitoring, 3D look ahead terrain, HITS, TAWS, TIS, TCAS, FLARM, PCAS, radio interface, and autopilot are just some of the countless and ever expanding functions of these systems. The coolest thing that I liked about the MGL is the user configurability. They provide tools that allow you to modify their existing screens and objects, or even create your own. You can even scan in sectional charts for display, (many already have and they are available online).



You can easily make these changes by copying to a provided SDRam card, or connect via the USB port on the back of the unit. To say the MGL Voyager that I am using is as powerful as a G1000 is a matter of

opinion, but not as far fetched as one might think With built in autopilot and the ability to control I/O such as your flaps and trim, plus, automatically tune your radios, the MGL EFIS family is quite powerful indeed. Unfortunately, the 10.4" Odyssey will only fit in the original Lightning panel, but the Voyager and Enigma both will fit in the new version of the panel.



The best thing is that you can outfit a complete 6 cylinder system for your Lightning for under \$6,000. That includes sensors, EFIS with GPS and autopilot functionality built in, and a 8.4" screen! When you consider the cost of the individual components that you would need to buy to equal the capabilities of the MGL, you can see how much of a bargain it really is.

In my opinion, the MGL series is the best value available today, and with more Lightning owners installing this great product, you'll have plenty of company.



This is a photo of **Jim's** current panel. He is now putting the finishing touches on his new Lightning panel that uses the newest panel design from Arion. We will have a future report and photos of his latest efforts.

**Jim Langley**

## News from the Factory:

### SLSA Lightning Sport Update:

Construction of the very first SLSA Lightning continues at a **blistering pace** as you can see from the photo below showing **Moostang Mike** so hard at work that he stands the chance of “**blistering**” his hiney. Actually, the first LS-1’s build progress is on schedule for a initial test flight in March.



**Moostang Mike** hard at work building the LS-1.

The below photos are some taken prior to the ASTM drop test; just one of the many tests required before the SLSA Lightning LS-1 can be ASTM-certified . These photos show the weighing process to get it up to the light sport max of 1320 pounds and then the last photo shows the test aircraft, at the proper weight, suspended and ready for the actual drop.



The test rig ready for the drop. **Nick** said, “It makes a hell of a noise when she goes.”

Scale reading of 1324 pounds for the test rig.

There are actually two drops required, one from 33 cm and one from 50 cm (that is about 13 inches and 20 inches),



and the purpose of the drop is to determine the amount of gear leg flex. Once the amount of gear leg flex is known they will be able to calculate the gear leg shock absorbing capability. It is estimated that the drop from the higher level will be equal to about 6 Gs.

For the record, all the required test measuring equipment and drop devices were finally in place and a **successful drop test was accomplished on 18 February, 2009**. SLAM, BAM, no problems, ma'am.

**When ASTM approval is received for the SLSA Lightning LS-1 prototype**, builders may then build and license conforming Lightnings in the **ELSA** category. Although the ELSA category does not permit builders to vary from the kit or plans (no unapproved engines, propellers, etc. are allowed) it does have some very attractive features. In the ELSA category, there is no "51% rule", and no restriction on who may assist in building the airplane. This allows any amount of help, professional assistance or even a professionally-built airplane.

**Several options will be approved for the SLSA Lightning**, so those same options will be available for ELSA builders. The base model will probably have what is being called "a four-pack" (ASI, ALT, VSI and electric turn coordinator) along with an SL-40 com, GRT EIS 6000, magnetic compass, and ELT. Two optional panel layouts are planned. The first panel option will replace the "four-pack" with a single screen EFIS and the second panel option will be a two-screen EFIS. Additional avionics options will be a transponder, autopilot, GPS, and an SL-30 nav/com radio.

**Other options** will be such things as wing tip navigation and strobe lights, cockpit access steps, tinted canopy, and engine heater. A Sensenich wood propeller will be the standard prop, but an optional Sensenich carbon fiber ground adjustable will also be available.

One change on the LS-1 that will be different from most of the EAB Lightnings that are now flying will be the location of flap and pitch trim switches. Instead of being located on the stick grip, the trim and flap rocker switches will be located on the center console near the fuel selector as it is felt that this layout will be a little more conventional for pilots transitioning from standard certificated aircraft.

The LS-1 will have outstanding performance when compared to other Light Sport Aircraft. Although the cruise speed at max continuous RPM is limited to 120 knots, all other performance parameters will beat other aircraft in the Light Sport Category. **Nick** wouldn't have it any other way.

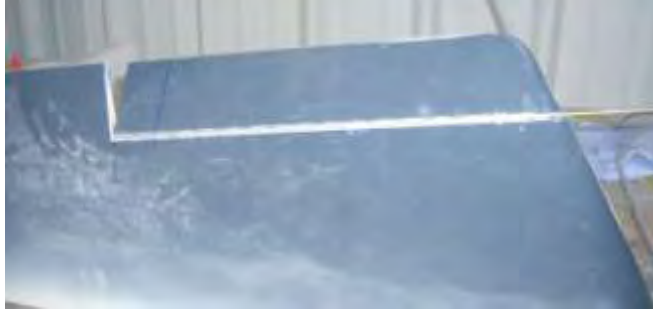
On the right is the latest photo just before departing for paint on 20 Feb.

Initial flight test is still on schedule to begin in March with the goal of having it on display at Sun-N-Fun in April. Everyone should plan on being there to see the new airplane and



the crowd's reaction to the newest, best performing, and best looking SLSA aircraft.





One last update photo. This elevator trim tab photo is actually from Carl and Pat's "jet", but the LS-1 will also have the tab built in. This mod is similar to the one that Pete "The Mod" Disher from Australia developed for his "jet".

## **Lightning Sales Update:**

***There is a new Lightning dealer to further serve customer needs. Dave Jalanti from New York state will be the Lightning dealer covering the northeast – Northern PA, Northern NJ, New York and the New England states. Below is Dave's recent message to me:***

Hello Buz,

I'm not sure if we have met but my guess is that we probably have at one of the major air shows.

In 1998 I purchased a Jabiru 2200 engine and installed it in my Kitfox IV. We went thru some growing pains but Pete provided parts and tech advice so things did get sorted out. Since then, I was involved in the build of a Kitfox 7 (Sport) with a Jabiru 3300. A few years ago I wrote a couple of articles about my Jabiru powered Kitfox IV. One article was a 3 part series for KitPlanes and the other a 3 part series for EAA Sport Pilot. I have helped Jabiru USA at most of the Sun-N-Fun air shows and the last two AirVenture events. For quite while now, I have acted as tech advisor for Jabiru / Kitfox installations and eventually formed an LLC. The company name is Jabiru Power Solutions, LLC. Initially I was selling Jabiru engines to Kitfox builders and FWF component for those installations. I also designed and supply Jabiru USA with the Throttle Extension Kit that is used in the Lightning, CH601 and other aircraft. In the fall of 07 I became a Jabiru SLSA dealer for Pete and I have gained a partner, Ronnie Ouimet. Ronnie has been in the motorcycle business for over 50 years. Along the way he also picked up snowmobile, personal water craft and ATV franchises and now has 4 stores and a mail order business. Ronnie has also been in aviation for many years and currently owns a C182 and a Jabiru powered Legend Cub.

The end of May last year I retired from IBM. I had had enough of IBM and wanted to concentrate on the Jabiru business. Meantime, I have followed and watched the Esqual when Jabiru USA brought it into the US and have watched the birth and progress of the Arion Lightning. Needless to say, I love what I see in the Lightning and in December of 08 I decided I to expand my company's offerings to include the Lightning. I talked to Pete and he has agreed to me becoming the Lightning dealer for the northeast, covering Northern PA, Northern NJ, NY and the New England states. The Jabiru Power Solution web site is being rebuilt (by a pro) and I have purchased a Lightning kit and engine and hope to start building my plane this spring. I also intend to offer a builder's assist program so I'll be spending time in February and March in Shelbyville working with Nick, Mark and Mike on a builder assist for one of their customers. This will teach me much of what I need to know about the Lightning build process as well as learning about how to make the builder assist program a success.

I've very much enjoyed your newsletters and appreciate the amount of work that goes into them. They are very informative and fun to read. I have gone back and read all of them in their entirety. As the build of my Lightning progresses (which I plan to build to the factory ELSA specifications), I'll try to feed you some progress reports, etc. Maybe some interesting stuff will come of it that you can use in a newsletter.

Anyway, I sure hope our paths cross sometime soon. It will be great to chat! (I'll be attending Sun-N-Fun and AirVenture again this year.)

Attached is a picture of my Kitfox IV. Take care,

**Dave Jalanti**  
Jabiru Power Solutions, LLC



## News from the Dealers:

### From Lightning Australia:

As a heads up, next month look for a great travelogue article with photos by **Peter Mitchell** about flying his newly completed Lightning home on a flight across Australia.

### From Other Lightning Dealers:

Hey dealers, I can't print the news if you don't send me any news. Remember this is your newsletter too, so use it to let us all know what is going on at your Lightning dealership. Lots of future and potential Lightning buyers read the newsletter and this is "inexpensive" advertising for you. So put down those golf clubs, take off those snow skis, grab a beer while you sit down at your computer and send me something to report – "Foot your own horn, so to speak". Other than that, **KMAGYOYO**.

## Current Lightning Dealers:



**Arion Lightning, LLC**, contact Nick Otterback, Shelbyville, TN, 931-680-1781, [www.flylightning.net](http://www.flylightning.net)



**Lightning Southwest**, Greg Hobbs, Marana, AZ, 520-405-6868,



**Green Landings Flight Center**, Ryan Gross, WV, 304-754-6010, [www.greenlandings.com](http://www.greenlandings.com)



**Lightning North Central**, Tom Hoffman, Neenah, WI, 920-836-2318



**Lightning Northeast - Jabiru Power Solutions, LLC**, Dave Jalanti, NY, dave@jabirups.com



**Sport Plane Dynamics**, Ed Ricks, Glendale, AZ, 623-695-9040



**Lightning Australia**, Dennis Borchardt, Kingston SE, South Australia, 08-8767-2145



**Lightning Brazil – Cimaer Ltd**, Claudio Nunes, Brazil 24 900-000, 21-2637-3605, 21-9451-9700



**Russia and CIS – AVIA-NIANIA**, Moscow, Russia, + 7495518-62-75, avianiania@mail.ru

## News from Builders and Flyers:

*This first message came in from **Jim Goad**, an early **Lightning** builder who has come up with several good suggestions for the **Lightning** in the past, such as a way to get more air into your oil cooler (see issue 1-4) and a simple way to cool your voltage regulator (see issue 1-10). **Jim's** latest accomplishment is a simple **“in cockpit” aileron trim system**. See the photos to the right and below along with **Jim's** message describing his work.*



Buz

I am sending you three pictures of my aileron trim installation that you might possibly include in the next newsletter. It works exceptionally well and my objective in installing it was that I would drill no holes in the center section of the spar box. I turned the pulleys out of a



piece of scrap nylon; the other parts came from ACE Hardware. The cable was fishing leader material. The cable coming from the right side had to come through the wiring and tubing under the console and I put it inside a nylon tube to keep from rubbing the wires etc.



The design was not mine, I have a friend who is building an RV and that is the arrangement these use for Aileron trim.

Several people have commented that the control sticks feel stiff when you push the ailerons. It never bothered me, but the fellow that has the RV asked me if I ever lubricated the linkages on the ailerons, which I had not.

So we grabbed the WD-40 and hit all of the linkages and nylon bearings on the bottom of the control

sticks and the result was that it really made the operation very light to move the sticks. We got a good laugh about it. Sometimes the fix is really simple.

### Jim Goad



To the left is a photo of **Jim's** "jet" taken on the ramp in front of the Lightning hangar in SYI.

Hi Jim,  
Thanks. Your solution looks great. Simple, effective, and **nothing to produce drag out**

**on the wing.** I had heard of similar systems on the RVs but had never seen one installed. I will definitely put your message and photos in the next newsletter. Some experimental aircraft also use a system similar to this for pitch trim.

As to lubricating with WD-40, I actually use a product called Tri-Flow. A mechanic friend recommended it many years ago and I have used it on all my airplanes ever since. Not only do I lubricate the bearings in the control system, I also lubricate all hinges and basically everything that moves during every annual inspection.

Hope to see you at Sun-N-Fun.  
Blue Skies, Buz

### **The following message is from Brian Whittingham about a new EFIS that will be out soon.**

All,

In the past decade we have seen a revolution in cockpit technology as affordable EFIS and AHRS have made their way into GA cockpits. I grew up in the computer age and find it fairly easy to switch between different EFIS displays. I realize that many of you and many of the engineers who design these systems did not though. I have been looking for something more exciting. I have been envisioning a series of smart MFD's that would have user definable presets, intuitive use, and touch sensitive. Alas, they are not available....yet.

What I found was a unique system that if it works as advertised will be an incredible leap forward. I mean this would leave the B787 pilots wanting. Imagine a touch screen system that uses some of the same technology as the I-Phone. When the display is off it simply looks like a shiny piece of plastic. When the displays come to life they are crisp and readable in the sunlight. They give you the ability to have a virtual horizon, engine display, navigational display, moving map, VHF and built in transponder, traffic avoidance, digital music input, auto CG and in flight weight determination, and much more. Pair it up with the Smartstick or Smartyoke display and you'll get a small quick select menu which can control lights, display the top 10 nearest airports with a direct to function, set all radios to a "home" airport, dial cell phone numbers and pipe it through your headset, control panel display brightness, and display all your personal checklists. The displays come in a 3.7 inch screen and a 5.7 inch screen and both panels are around 1.5 inches deep. All displays link up and cross communicate with one another. If your digital radio fails for whatever reason on one screen then you can pull it up on another screen adding redundancy. If your engine fails in flight it can be set to display the appropriate checklist. Alternator stops charging the battery, pulls up that appropriate checklist. Change your mind and want to go to another

airport off-course, or want to add in a waypoint you simply touch the screen where you want to add that in. For me I love the data collecting and analysis. Well, with one of the functions it will record all flight, GPS Nav, and engine data for the entire flight to a USB drive.

It is true that it's still in development. Last year they were projecting the price for 8 displays to run around \$13,000. That's still a little steep for a lot of people, but how much of that functionality do you have with your current setup? If you get 2 screens what does that come out to be? I'm not sure, but I think that it'd be pretty competitive pricing. You could have a fully customized panel (similar to some custom audio car panels) which would look almost entirely like a single piece of shiny black plastic when the system is off, and then when you power it up it all comes alive. For you old military types, they also plan to have an optional HUD. Plenty of other goodies like an integrated black box, autopilot, trim, flaps, backup battery, RAT (Ram Air Turbine for emergency power). It also is supposed to draw about 500mA per display. Do the math on that, it's really good.

Just armchair flying and dreaming of the not too distant future. Check it out for yourselves here: <http://www.pkaviation.com.au/page8.htm> and here: <http://www.pkaviation.com.au/page19.htm>

**Brian W.**

***Tex Mantell (from NY) sent the following photo and comments about the great weather he has been having up north. Tex says:***

—MIGHT MAKE TO THE HANGAR SOON AND DO SOME FLYING. WINTER IS ALMOST OVER AND SPRING IS JUST AROUND THE CORNER, WE CAN SEE THE DEER WANDERING AROUND IN OUR BACK YARD.”

**Tex**



***Many of you remember the great Lightning build articles that Paul “Bear” Bryant wrote for the newsletter back in November and December 2008. Well, Bear is now flying his Lightning and having a great time. Just look at the “Lightning laugh” on his face.***

Folks,

Yes, there is a Bear in the air! I finished up my transition training yesterday and today was my first solo flight in my "jet". Here are a couple of pictures after the flight....

**Bear**





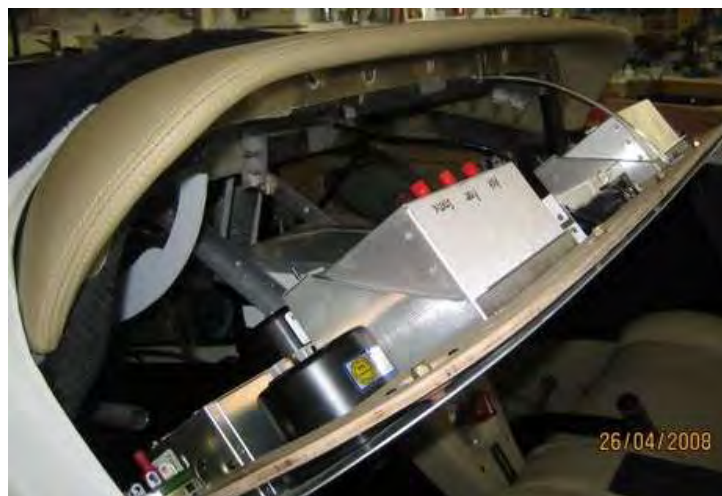
This photo shows **Katie** in **Bear's** jet.



***Below is the latest from Pete Disher. Pete's Lightning has probably has been built with the most builder developed modifications that I have seen. His "mods" range from performance and speed enhancements to ease of maintenance changes such as shown below with his "hinged" instrument panel. Great job on your jet, Pete.***

My panel hinges out about 45 deg, have rubber mounted it with Lord mounts onto 1/4" 12 ply, held closed with 2 washer head screws one on each end. Works real well for me. Access just great. 4 pictures att.

Pete D  
VH-PDI  
kit 30





This following message is from **Johnny Thompson**. You probably remember him as the Lightning builder from Arizona with the “California style” hot rod full flame paint job (see below).



Hi Buz

Here are some pictures **Greg** asked me to forward, I think for the newsletter. I could not get him to write something up.

**Greg** is updating his plane to all the latest changes by Arion. **Greg's** new plane is progressing well. In the final stages of finishing the lay-ups on the wings and tail. He is about finished with the elevator mod. He is trying something new in installing the canopy. After several builds with the new trim for the canopy we have found it to be a lot of work. **Greg** is using 2 layers of 4 inch wide 8 oz glass then smoothing with micro balloons. The advantage appears to be faster, easy and makes the frame more rigid. Also looks like it will help the canopy seal better on the fuselage. Downside is it may cause you to have to replace the canopy glass if you have to remove it for any reason. With all the previous systems use by Arion we have found it





very easy to remove the glass and then reinstall it.

My repair and modification of 8WN is near completion. I am very impressed with the condition of the aircraft after my landing incident. Repairs were easy with no structural damage to the airframe. I have modified the legs fairings slightly. On the nose fairing I lengthen it at the top. On the main leg fairing I split the hinge and installed the rods (2) in the center which allows me to remove the fairing without removing the pants. I believe this mod allowed me to make a much better fit of the between the fairing and pants. I drilled a 1/8th inch hole in the fuselage where I now insert the

fairing hinge pin to lock it in place. Also took a piece of the leg fairing and made a cover for the inboard end of the axel. Very simple and looks very clean. The new elevator balance mod was easy and the new wing tip extension look great, I made my removable. Will try to take pictures this morning.

Hope you like the way we now install the wheel pants and work on the lower part of the aircraft. Getting too old to crawl on the floor. The aero lift is one I had in my hanger and thought **Greg** could make good use of it. The only thing we need now is a Lazy-Boy on wheels!

**Greg's** Build Center is really getting nice. He has two Guest rooms with two beds each at the Hanger. Saves a lot of money for the builder. An exercise room with hot tub is a real plus but can slow down the build. As for equipment the aero lift allows one to work underneath the aircraft with ease. A metal break and welding equipment allows custom building of most anything the builder wants. Two builders can work at the same time with dual band saw, drill press, air compressor and other items. With up to seven aircraft in the large hanger space to work is not a problem.

About time to head off to **Greg's**, have a great day Buz.

**Johnny Thompson**

N8WN Marana Az. (I Moved out of the airpark with all the cows on the runway)

***This next message is from Carl and Pat Beatrice from New Hampshire (and Florida in the winter months – smart people). As this is being written (18 Feb 2009) they are currently building a Lightning using the builder's assist program in Shelbyville. This is the second airplane that Carl and Pat, both pilots, have built, and they have been great at sending in information and articles for the newsletter. This short write up is about their recent trip to the Sensenich propeller factory in Florida. You can contact Carl and Pat at: flyers.nh@myfairpoint.net***

Hi Buz: We're here at SYI and its day two. Yesterday we put the wings on. That was really exciting!

Have you ever wondered how the propeller on your aircraft is made?



On January 22 2009, while on our way to the Sebring Light Sport Expo., my wife Pat and I flew into the Plant City, FL, airport. A telephone call to the nearby Sensenich Propeller Co soon brought Charley Denny to drive us the short distance to the plant. Charley gave us a very detailed and informative tour of the facility.

At Plant City, wood and composite props are made while the metal props are made in Lititz, PA. Starting with the wood props, they get their start from a fine quality yellow birch board. Several layers of the yellow birch are laminated together using special glue (resorcinol). Then they are brought to a drying room. After drying, rough shaping takes place with a C & C machine. Then the propellers are hand carved. Templates are used for final shaping by hand. The leading edge of each blade has either a synthetic or a metal strip installed and then they are balanced. After which they are sprayed with marine spar varnish. (If color is desired, 2 part poly paint is used.)

The composite propeller blade is hollow, starting with a latex bladder. A pre-pregnated outer layer is formed over the bladder, and then heated in a mold.

Our visit to Sensenich was really worthwhile. We're grateful to Sensenich for making it all possible.

**Carl and Pat**

***NOTE: You can contact Sensenich at the following address or number:***

Sensenich Wood Propeller Co., Inc.  
2008 Wood Court Plant City, FL 33563 USA  
Phone (813) 752-3711 Fax (813) 752-2818  
Http:\\www.sensenichprop.com



## **Flight Safety:**

Buz,

**Two** General Aviation aircraft **per week** are experiencing fuel starvation due to inadequate flight planning and Fuel Management. Pilots are turning their powered flights into gliders because they run out of fuel en-route to their destinations. Please find attached an interesting article on the subject to share with our Newsletter readers.

Craig  
N155JM Esqual VM-1

**NOTE: Craig Sumner, Chief Engineer for Space Shuttle Propulsion Elements of United Space Alliance, and our esteemed “Lightning Newsletter Safety Officer”, sent me an article from the AOPA Air Safety Foundation. It was great reading, but for this newsletter I have removed some items that do not pertain to the Lightning or the Jabiru engine and generously added some information that does. Below is the results of my editing:**

Some people think that the terms **fuel starvation** and **fuel exhaustion** have basically the same meaning, but I think that there is potentially a big difference. Although they both normally have to do with fuel mismanagement, the term fuel exhaustion to me means that you have totally exhausted the fuel on board an aircraft – the engine then quits. On the other hand, fuel starvation means that the engine quit when it was starved for fuel either because the tank you selected ran out of fuel or there was some other fuel problem, such as engine driven fuel pump failure, that keeps fuel on board from getting to the engine. With failure of the engine fuel pump, turn on your electric fuel pump. But if you just forgot to switch tanks, you should be able to restart the engine by selecting a tank with fuel in it. Now that I have covered that, here are some additional points on how to avoid either of the causes of “running your aircraft out of gas”.

**1. Know How Much Fuel You Have:** You can’t know your range unless you know how much fuel you have on board, but knowing that isn’t always easy. Here are some thoughts:

- **Think of fuel not in gallons, but hours and minutes.** Why? Because your fuel burn is a constant if you don’t change power setting or altitude. The engine, barring some malfunction, will always burn the same amount at a given combination of altitude, power setting, (and mixture setting if you have one), but range will vary constantly due to changing winds and ground speeds. To know how much time you have, you need to know how much fuel your engine really burns. The POH (pilot’s operating handbook) charts and figures will get you close, but only experience will tell you for sure. This is one of the important things you should have tested for while you were flying off your Lightning’s 40-hour phase one test period. You did that, didn’t you? **Tip:** The AOPA Air Safety Foundation recommends that pilots of unfamiliar airplanes add one or two gallons per hour to their computed fuel consumption until they see how much the airplane actually burns.

- **Know for certain how much usable fuel is on board.** Fuel computers (if you have one with fuel flow capability) can accurately tell you how much fuel you’re burning and how much you have left – but only if you input the starting fuel quantity and only if you calibrated the fuel flow transducer during your flight testing. A calibrated dipstick is a good way to measure fuel, but be sure it’s calibrated for your airplane. The very first time you added fuel to your tanks after your build, you should have developed a calibrated dipstick for your airplane. If you always depart with tanks full, then you don’t need to dip the tanks before your flight, but often you cannot do that because of weight or CG considerations.

**2. Know Your Airplane’s Fuel System:** Pilots must also be familiar with and proficient in operating the fuel system on their airplanes. Fuel management on a high-wing aircraft is relatively easy. Two wing-mounted tanks simultaneously gravity feed fuel to the engine and the fuel selector is either on or off. Or if the high-wing aircraft has selectable wing tanks, you can safely select both tanks to feed at the same time. Compare this with a low-wing aircraft, such as the Lightning, and you potentially have a problem if you select both tanks at the same time. The reason that this can be a problem is that with both tanks selected on a low-wing airplane and one of the tanks uses all of its fuel before the other one, then what is it easier for the fuel pump to suck, air or fuel? Of course, the answer is air. The engine will quit due to fuel starvation. Yes, it has happened many times in low-wing aircraft. That is why I have always recommended that low-wing aircraft, like the Lightning, NOT have a both tanks position on the fuel selector valve, or that you not build a low-wing airplane with a fuel valve for each tank. Note: A fuel selector valve with a left, right, and off positions (such as the Andair valve) is what I recommend for your Lightning.

**3. Know What’s in Your Fuel Tanks:** Pilots must ensure that their tanks contain the proper grade of uncontaminated fuel. That means making sure that no water has gotten into the tanks, and verifying that the tanks haven’t been filled with the wrong fuel. You should take fuel samples to verify that you have uncontaminated fuel of the proper type and grade in each tank.

**4. Update Your Fuel Status Regularly:** Winds are rarely exactly as forecast and weather deviations add

miles and minutes to your trip. We recommend that pilots evaluate their fuel status each hour. If you know how many minutes of fuel you have and how long it will take to reach your destination or fuel stop, it's easy to know if you'll need your reserve. Digital fuel computers and graphic engine monitors can make it easier to track fuel status. I highly recommend you install and calibrate a fuel flow system in your Lightning. By comparing your GPS time to go with your fuel available in time, you will always know whether you need to stop short of your destination to take on more fuel.

**5. Always Land with Adequate Reserve Fuel:** Federal Aviation Regulations (FARs) require different fuel reserves for different operations. Regardless, **the AOPA Air Safety Foundation recommends that pilots always LAND with at least one hour of fuel in the tanks.** This does not mean searching for an airport when approaching the one-hour reserve; it means being on the ground.

**Now that we've hit the major points, let's add some Details:**

### **Avgas**

The earliest airplanes used automobile, motorcycle, or tractor engines, and low octane fuel was sufficient to power them. But with the introduction of high compression engines and the special requirements of flying machines, aviation gasoline (avgas) was developed. Volatile, low octane fuel burned too easily in high compression engines. This resulted in combustion before the spark plug fired while the piston was still compressing the air/fuel mixture. To prevent this damaging preignition or detonation, lead was added to avgas to slow down the combustion process. The combustion quality of fuel is expressed as an octane number. Effectively, the higher a fuel's octane rating, the more resistant it is to burning. 100 low lead (color dyed blue) is the most common avgas today. The old 80 (red) and 100 octane (green) avgas have not been readily available for several years and may now be totally off the market.

### **Jet Fuel**

Jet fuel is very different than avgas. Like kerosene, it burns at much higher temperatures than gasoline engines can withstand. Because jet fuel will damage or destroy gasoline engines, a number of safety precautions (color-coded wing decals, special nozzles for jet fuel, etc.) have been put in place to prevent mis-fueling. Jet fuel nozzles are shaped like a duck's bill, and will not fit into standard avgas fueling receptacles.

### **Autogas**

Although automobile gasoline (autogas) of 91 octane ((R+M)/2 method) or higher can be used in your Jabiru engine when aviation gasoline is not available, remember that aircraft engines are generally designed to run on avgas. Remember the following about automobile gasoline:

- It has looser manufacturing specifications and quality control is less stringent, so quality and performance may vary widely. Note – Since autogas is more volatile than avgas, you may actually see slightly lower fuel usages.
- Because of less careful handling, the risk of contamination before you get it is greater.
- Physical and chemical property differences can lead to poor fuel distribution, poor anti-knock properties, and excessive motor oil dilution. Additionally, autogas is less stable and more likely to gum up.
- Because autogas is more volatile than avgas, it is more prone to loss through excess vaporization, vapor lock, and carburetor icing. Nonetheless, many pilots use autogas in their airplanes successfully.

### **Managing Fuel in Flight**

To maintain lateral balance try to keep the tanks as equal as possible (within reason). For example: After takeoff, you might fly for a half-hour on the left tank, and then an hour on the right tank, switching hourly thereafter. This should keep you from having more than a half-hour's fuel imbalance at any given time. Many pilots mount a timer in plain view to remind them to switch tanks.

### **Carburetor Heat**

As air moves through a carburetor its temperature drops and, if conditions are right, water vapor in the air can condense and form ice. Most carbureted aircraft are equipped with a control that routes heated air to the carburetor to melt the ice and keep it from re-forming. Operating with carburetor heat results in a richer mixture because the heated air is less dense than ambient air. Applying carb heat enriches the mixture and increases fuel consumption for a given power setting.

### **Estimating Fuel Consumption**

Using flight test data, charts, or graphs, the POH shows fuel consumption for various power settings. This will give you some idea of what the fuel consumption will be, but remember: Fuel consumption figures are based on a properly tuned engine operating at a specific power setting. **Tip:** One way to get to know your fuel consumption is to estimate how much fuel your airplane will take at each fuel stop. Comparing this estimate with what actually goes into the tanks is an excellent way to develop “fuel sense.” Many pilots make a game of this—seeing how close the fuel bill is to their prediction. In flight, recalculate range and endurance hourly. Compare your range calculation with the distance to your destination to make sure you maintain an adequate fuel reserve. By doing this, you can make timely adjustments to your flight plan for unforecast winds, or weather deviations. A GPS receiver can be a valuable aid in managing fuel consumption. The GPS provides accurate information about ground speed and time en route, which are essential parameters for determining adequate fuel reserves.

### **Extending Range**

Long deviations around weather, stronger than forecast headwinds, or discovery of a low fuel condition may require you to maximize fuel economy. Let’s take a look at some ways to conserve fuel.

- **Slow down:** You’ll burn less fuel if you cruise at a lower power setting. However, it is possible to overdo this compensation by slowing too much. Know your aircraft’s best cruise power setting. Also, use your GPS to compare the time to destination with the fuel remaining. Obviously, pilots should make adjustments to their flight plan before fuel becomes a critical issue, but if you’re low on fuel or, worse, dipping into the reserve, land as soon as possible. Don’t wait for the FBO with the best price or the preferred credit card.
- **Fly with the wind:** If you have a choice of equi-distant fuel stops, pick the one that’s downwind. You may have to backtrack but you’ll burn less fuel and get there faster. **Tip:** Pilots coordinating with ATC and running low on fuel can declare a minimum fuel advisory. This means delays cannot be tolerated and will likely result in an emergency situation.

### **The Fueling Process**

Most FBOs that provide fuel also have line personnel to dispense it, but self-service fuel facilities are becoming very common. Whether you are supervising the service or performing it yourself, pilots should know about the fueling process.

- The first thing is to make sure there will be fuel and some way of dispensing it when you arrive. This isn’t likely to be a problem at large FBOs, but be sure to call ahead if you don’t want to take a chance on spending a night in the airplane.
- Make sure the airplane is grounded. Static electricity around gasoline can be explosive. This is why line personnel attach a ground wire to the airplane before fueling. Always make sure that the airplane is properly grounded before beginning the fueling process.
- Make sure the proper type and grade of fuel will be used. Most fuel trucks and pumps are clearly marked. If not—or if you’re in any doubt as to the quality of the fuel—sample it before putting it into your tanks.
- If you intend to fly with full fuel, make sure the tanks are absolutely full. If the airplane is not on a level surface it will be impossible to fill the tank completely. Fuel expands when heated, so if your plane is filled with cool fuel from underground tanks, you may lose some fuel through the vents due to expansion. Similarly, a full tank in mid-afternoon may be less than full after it’s cooled overnight.
- Take a generous sample of the fuel you’ve received. It’s a good idea to pay for the fuel and attend to other last minute details before sampling. That way any contaminants will have some time to settle to the fuel tank sumps before you check them.
- Finally, make sure the fuel caps are secure. If you lose a fuel cap in flight, fuel can siphon out of the tank at an alarming rate, and if you’re in a high-wing airplane or flying at night, you won’t be able to see it.

### **Disposing of Fuel Samples**

Apart from being a fire hazard, discarded fuel samples can destroy asphalt ramps over time, and evaporated fuel contributes to pollution. For those reasons (and because it’s illegal in many places) it’s not a good idea to throw fuel samples on the ground, or into the air. Some pilots shudder

at the thought of pouring samples back into the tank; but if the fuel is uncontaminated, why not put it back? Some airports provide special containers for disposal of waste fuel, and pilots can purchase strainers to filter contaminated samples.

### **The Bottom Line**

Of all the factors that lead to aircraft accidents, fuel is one of the easiest to address. If you know your fuel system, verify that you have the right type and quantity of fuel, lean your engine properly and stay alert to changing conditions, the odds of a fuel-related mishap are virtually nonexistent.

## **Upcoming Events:**

**13 to 15 March – Jabiru Engine Seminar at Shelbyville, TN.**

**21 to 26 April - Sun-N-Fun at Lakeland, FL. Lightning** in Booth LD005. Lightning get together will be noon Friday at the Lightning booth.

**15 to 16 May – Jabiru Engine Seminar at Shelbyville, TN.**

**30 to 31 May - Virginia Regional Festival of Flight.**

**27 July to 2 August - Oshkosh AIRVENTURE.**

**25-27 September (most likely date) - Lightning Fly-In at SYI.**



## **Lightning Skunk Works:**

This month's Lightning Skunk Works report is a little different. Normally we try to show you ~~—secret~~ aircraft projects that the Arion crew is working on for the future. This month we are going to ~~let~~ "let the cat out of the bag" on a new **advertising campaign that Arion is coming up with**. You have probably seen the aviation magazine ads for the Van's Aircraft, Inc. that shows an RV pilot in the cockpit of his aircraft. The photo caption goes something like **The RV grin that is seen whenever a new RV flies**. Well, not to be outdone, the Arion guys took a photo of a Lightning pilot with ~~the~~ **Lightning laugh" that is seen every time you fly a Lightning**. See below:



# The Lightning Laugh ...

That is seen *every time* you fly a Lightning.

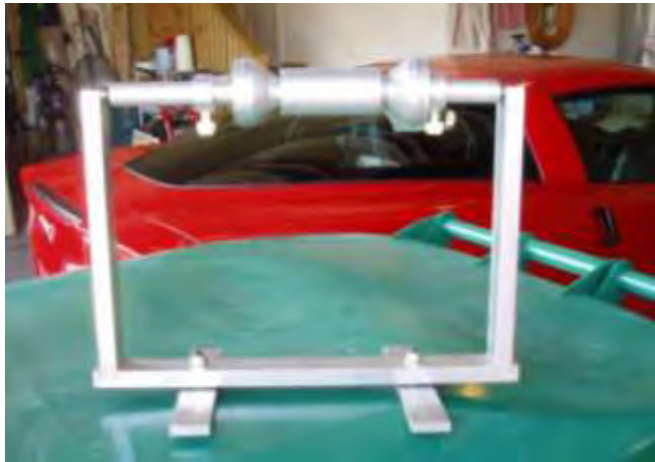
## Technical Tips:

**Gear leg or wheel shimmy** is a subject that seems to rear its ugly head ever so often in the homebuilt aircraft world. Aircraft with round gear leg rods, such as on the Lightning and the RV series, seem to be more prone to the problem than other types of landing gear leg designs. The cause of the shimmy probably varies, but the amount and severity of the shimmy seems to have to do, not only with the design but, with many other factors as well. Such things as toe-in or toe-out, tire pressure, gross weight, runway surface, and wheel / tire balance have all been identified as making a difference by various Lightning builders and pilots.

**Wheel and tire balancing** seems like a relatively easy thing to do until you attempt the job using the standard aircraft type of wheel balancer that is available for the industry standard Cleveland wheels. Our smaller axle Matco wheels cannot be balanced using that standard aircraft wheel balancer. The Matco bearings are too small to fit over the balancer axle. What to do?

**Linda Mathias** solved the problem by taking her wheels with the tires mounted to a motorcycle shop. They were able to do the job with the balancer they had. But in case you are like me and want to “buy

**another new tool”** and do the job yourself, here is a solution I have found. Racing Go Carts all balance their wheels and thus have the right tool to do the job; and that tool will fit the Matco wheels. The photos below show the balancer I now have and it can be found online for about \$50.00 US. As you can see, with the adapters it will fit about any size aircraft wheel. Also, the small bearings on each end allow the mounted wheel to easily turn without depending on the wheel’s own bearings. Besides this tool, you will need some small stick-on wheel weights, a marking pen, and some tape.



The racing go cart wheel balancer photos above kind of look like a government TP dispenser.

The steps to balance a wheel are below:

1. Attach the wheel to the hub and slide hub onto spindle. Center the wheel on spindle and put ends of spindle in to balancer sides. Spin wheel lightly and allow it to stop on its own.
2. Mark the wheel at the very top with marker. You have now determined the lightest point of the wheel.
3. Cut a piece of weight and attach it to wheel at the light point mark using tape for now. Try to get weight as close to the hub as possible. Now turn the wheel until weight is at the 3 o'clock or 9 o'clock position.
4. Let go of wheel. If weight falls to 6 o'clock position, then you need to remove some weight. If weight goes to 12 o'clock position, then more weight needs to be added.
5. Repeat the above steps until tire is balanced. This has been achieved when wheel can be placed at any clock position and the tire does not move.
6. Remove the tape and stick the weight back in the same place by peeling the paper off the back of wheel weight. Some people even use a small dab of epoxy to help hold the weight in place.
7. Have fun showing off your new tool and hope that your newly balanced wheels and tires help your shimmy problem. Your mileage may vary.

## **Reader Feedback:**

**This section will contain messages that I get from readers that really don't fit the News from Builders section.**

**The following two messages come from a Lightning enthusiast in Sweden. He has corresponded with Nick before and below he shares some of his thoughts on the Lightning and his desire to build one in the future. My answers back to him are included.**

Dear Buz,

After lurking around at the Forums and following the lightning, I am hoping to order one as soon as the "admiral" allows me to and I get my medical back.

Knowing that you, with joy, fly the Esqual LS maybe it could be of interest to know about this Swedish "enterprise". Being a Swede myself I was surprised to find this over here! (<http://www.esqual.se/>) Although I still think the Lightning is just right for me and hope to build and fly one someday.

Buz, don't remember if we already "talked"? I think Nick once forwarded me your mail regarding handling (gentleman's aero) on the Lightning and a few other issues. Of this I am a little unsure because this was about a year or more ago I think.

Unfortunately last summer when I was in Louisiana to buy and ship a trawler over here, I missed the opportunity to see you guys and look a little closer on the Arion stuff, maybe this year instead with some luck. The wifey thinks I do have too many toys and works against my plans to import a kit from Nick so I need to change my strategies and lobbying this year! :-)

Being a former semi pro pilot flying the last 10 years as captain on the Air ambulance (king airs) I miss it (flying that is) because I been away from it due to kidney stones a few years, witch by now is gone and ok, I am hoping to receive clearance within the next month to commence flying after some refreshments an proficiency checks, then maybe I can convince the wife of the absolute need for a Lightning too. (finger crossed)

It will be fun to learn about the differences between the Lightning and the "new" Esqual, Guess it's more than the wings that differ? Do you have additional info about Esqual's history in US and the changes made? I think I read that the designer was killed trying to do a low level loop somewhere down in Europe but maybe I am misinformed?

Hoping to hear from you sometimes in the future! All the best!

Blue Skies!

Ivan [midwing@telia.com](mailto:midwing@telia.com)

***Below is my answer back to Ivan. Let's hope he can convince his bride that he really needs a Lightning.***

*Hello Ivan, It was good to hear from you. Yes, I knew that the Swedes had bought the rights to the Esqual. I sure hope they address some of the major weaknesses of the design, poor quality welded parts, and non-aircraft kit supplies such as brakes, etc. I changed so many things that I thought were not really strong enough or not of aircraft quality. Luckily the first Lightning prototype was being designed when I was building my Esqual, so I got many parts from the Tennessee guys. As a result, I feel my Esqual LS (Lightning Stuff) is much stronger (I only used Lightning welded parts on my Esqual) and certainly much faster because of the Lightning cowling and gear leg fairings and wheel pants.*

*Overall the Lightning is a much stronger and safer airframe that is easier to maintain. Also, it is much faster than a stock Esqual. So I feel you would certainly enjoy building and flying a Lightning. You really do need to stop in Tennessee to see the Lightning guys and take a demo flight.*



*One suggestion since you asked about the Lightning/Esqual history - go to the Lightning web site (<http://www.flylightning.net/>) and then go to the newsletter section. There you will find all the past Lightning newsletters and if you read the issue for March 2008 (issue 1-2), you will get a good feel for the history of the Lightning and how the Esqual fits into the background of this new design. In fact, I think you will learn a lot about the Lightning from looking over all the past newsletters.*

*Finally, I wish you good luck in talking your wife into a Lightning. If you ever get to Virginia, bring her along and I can take you both flying (one at a time of course) in my Esqual LS and I can probably get Linda Mathias to give you a ride in her Lightning. Of course, you would probably want to visit the guys in Tennessee so you can see an actual kit and see one under construction. They are great people and it is a fantastic design, a quality kit, and a great performer. You will like it.*

*Blue Skies,  
Buz*

Hi Buz,  
Thank you for the replay and the friendly invitation! (Also thanks for the Esqual info, think the Swedes will try to bring parts and stuff to top standard and they will make it available to all owners.)

Would love to get closer on the next trip over. A visit to the guys at SYI is a must before a purchase witch I really hope to be able/allowed to do soon ; )

I have read and familiarized myself for quite a while by now, and the newsletter is a must read item monthly! Feels like due to the effort you and others put in, the lightning community stays on top of things, God Work!!

As you probably suspected I talked a little to Nick about the possibilities to ship a full kit to Sweden earlier in the production, and have since then followed the progress and all the god updates on the kit build and manual over the forum and newsletters. This of course keeps me convinced about witch plane to buy! (Wife permitting) :- ) The Esqual has never been a real contender even if the looks are really nice!

As I previously mentioned I asked about the ability to safely do gentle aero and think that this questions was difficult to answer due to liability reason or such, however I think easy and gentle "ballet" is ok? I believe you are the one with the best experience on this matter regarding the Lightning, and probably in line with the manufacturer you don't recommend any aero what so ever, but I would like to know if the ability is there if the urge gets too strong to throw the bird around safely a little.

Buz, although we haven't met (yet) I feel like we would get along fine, and after all the things I read from you I like your attitude! Really appreciate all the info and looking forward to seeing you sometime in the future! Maybe even if things go the way I hope Nick and the guys could have some use for a Guy I Sweden as a possible agent/distributor or something, will see? Also, I feel somehow connected already and if you do pass by you are very welcome to stay here and I would be glad to show you around the interesting parts of Sweden. It was with great joy I read your friendly mail! I will for sure se too that we meet next time I cross the pond.

Interestingly my wife by "coincidence" today mentioned that I should go ahead and aim for a 2 seater composite aircraft!! (she promised me that I could buy one as soon as I got rid of the pile of tin in the garage, which was supposed to become a MF19 HB) a nice little homebuilt witch actually could claim the fact that as a homebuilt, it has put MIGs out of action, (they had rocket pods and the MIGs were parked :)) This all happened down in Biafra or Kongo way back and the guy involved was that famous Gustav Carl Von Rosen. (there is some interesting history there)  
(I sold the kit about a year ago)

Since I am no longer an owner of a MFI, I am definitely closer than ever to a Lightning, still the boss is a little reluctant to set me free, due to the fact that I last summer vent over and bought that Camano 31 Trawler.

Keep your fingers crossed and I might be able to put an order in within this year! Meanwhile I will be lurking around on the forums checking you and the others out!

Again, Thank You for sharing and being so friendly!! Looking forward to see you in person and maybe pick up a few good habits or two!

Until then, All the best and crystal clear and Blue skies!  
Ivan

*Hello again Ivan,*

*As you probably know, just about any airplane can be flown in a gentle "ballet" if the pilot is proficient enough - careful, smooth, and precise. The key of course to your question is the word gentle. I try to never recommend aerobatics to anyone since I don't know who might be listening and what their capabilities might be. Heck, I even suggested that the guy that bought my S1-S Pitts should not do aerobatics until after he got a thorough check out in a 2 place Pitts. In fact, I told him I would not even sell it to him until after he did so. He balked at first but finally agreed. It is always better to be safe than sorry. So that is why Nick and I never "talk about rolling or looping" the Lightning.*

*Yes, I think you should look into becoming a Lightning dealer for your part of Europe. They do have a guy in Russia that will be listed as a dealer, but I don't think he has sold any Lightnings other than the one that he bought. Maybe when he gets it flying he will market it there. So talk to Pete or Nick and see what they have to say.*

*Good luck convincing your bride that you need a Lightning. Next time you get to the US, bring her along and we can make sure she gets the opportunity to fly in one.*

*Blue Skies,  
Buz*

## **Other Items:**

After I finished editing the Flight Safety article above about fuel issues and potential emergencies, some additional thoughts came to mind. Below are some more things to think about that will help you Fly Safe.

Your best defense against the wrong fuel being put into your airplane is to **be present to watch your airplane being fueled**. Only then can you be sure that only the correct **type** of fuel is added, the correct **amount** of fuel is added, and the fuel is pumped into **the correct tank(s)**.

**That happened to me** many years ago (actually on 3 July 1989) when I was **flying my single seat Pitts from California to Virginia**. During an afternoon fuel stop in Georgia, I shut down on the ramp right in front of the FBO and, having noticed deteriorating weather to the east, decided to stop there for the night. The young airport attendant came out and asked if I needed fuel. I answered yes, but asked him to hold on for a minute because I like to do it myself. The reason that I asked for the delay was that I saw an open hangar nearby that looked like it had room for my Pitts. I walked down to the open hangar, which was about 100 yards away, and started talking to the guy in there. He said he would be more than happy to let me put the Pitts inside for the night. About that time I noticed the young airport attendant had actually pulled the fuel truck up to my Pitts and was putting fuel in my top wing tank. OOPS, big problem. That was a 4 ½ gallon **smoke tank – not a fuel tank**. But to make matters worse, I had recently removed all the plumbing that normally fed the smoke oil into the smoke exhaust nozzles. Why, because I had stopped flying airshows to concentrate on competition, and you were not allowed to use smoke in

competition. So to save weight, which means better performance, I had removed all of the smoke system that I could get to. Heck, every pound saved in an aerobatic airplane means more vertical performance when you are going straight up. I know, kind of anal, but hey, that is competition aerobatics. Anyway, by the time I ran back to the airplane he had already pumped over 8 gallons into that 4 ½ gallon tank. Where was all that fuel going? Right out the bottom of the tank and aimed right into the open cockpit. My parachute was soaked with fuel and I was not a happy camper. I won't go into the steps I had to go through to dry out the cockpit and my chute, but I did point out to the "eager to help" kid that there was no fuel decal around that tank opening on top of the wing as required by regulation, and as there was around the fuselage tank opening specifying 100 LL. Of course he was very apologetic, but I hope he learned a valuable lesson that day. My efforts to dry everything lasted the rest of the afternoon and must have been successful, as I did not become a huge fireworks display when I cranked up on the 4 of July to resume my trip. Heck, that entire trip was one event after another. A real adventure.

Now back to some flying safety thoughts. We have been talking about fuel problems, **but if your engine quits for whatever reason, what will you do?** As much as we would all like to think we are ready to do the right thing, at the right moment, even the best among us will probably have a moment of denial at the onset of a serious problem. Just like the "Hero of the Hudson", Sully Sullenberger, did on his famous water landing when he said he couldn't believe it was happening to him.

In any emergency it's imperative that the pilot does whatever it takes to fly the airplane safely, even during that inevitable initial period of denial. Yes, emergencies are rare, or aviation would not have its overall superb safety record, but the pilot must seize control of the situation if he/she is to avoid "just going along for the ride". That is where airmanship and complete understanding of what it takes to maximize safety and performance make the difference. Remember we have said before that **in any emergency the three important things are:**

- 1- Maintain aircraft control.**
- 2- Analyze the situation.**
- 3- Then, and only then, take appropriate actions.**

At the beginning of any emergency, in those moments when you know something is wrong but you don't yet know exactly what, here is what I mean by **Maintain aircraft control:**

- 1-Level the wings (to put all your lift vector in the vertical).**
- 2-Kill any yaw by stepping on the ball. By this I mean, if the ball is left, use left rudder.**
- 3- Control airspeed by pitching down if slow, up if fast.**
- 4- If at any point an aircraft does not respond to your control inputs, it is time to "unload for control". By this I mean reduce angle of attack by going to a "light in the seat" feeling. This insures the wings are not stalled and allows you to regain control.**

Do the above things and you'll maintain control of the airplane long enough to collect the information you need to **analyze the situation**. Then apply the aircraft knowledge and training you have been given to **take the appropriate actions**.

One last point to remember, if you are going to have to land off-airport the following critical items will help you have a successful outcome: **Land with the wings level, under control, at the lowest safe airspeed** to maximize your chances of survival.

## Final Thoughts:

Can you believe we are already two months into 2009? If you are like me, you have probably already pretty much blown your New Year's resolutions and are back to business as usual. Well, let me suggest some resolutions for all of us to work at as the flying season gets underway for another new year. So in no particular order, here goes a suggested list of **flying resolutions for the 2009 flying season**:

**Take someone flying every chance you get this year.** By doing so you not only help spread the word on aviation, but you get to show off your Lightning and what a great airplane it is. So get on board with spreading the good news of aviation and get involved with both Young Eagle flights and old buzzard flights as well. Offer flights to other pilots and the non-aviation public as well. Have your neighbors been with you to the airport? Have you taken them flying? It will put a smile on your face as well as theirs. Share the Lightning laugh.

**Improve your own flying and landing skills with lots of practice and currency.** Of course, that is kind of a catch-all comment, but here is what I am talking about:

**Keep the ball centered.** Relearn what your feet and rudder pedals are for in all phases of flight. When doing stalls, it is imperative if you want the break to be straight ahead. For slow flight, where you need to work the Lightning rudders for coordinated flight, put the ~~—ball~~ in your cross check until you develop the seat of the pants feeling that tells you when you are not in coordinated flight.

**Practice landings**, and by this I mean both the pattern and touchdown. No one makes a greaser every time, so a little practice is always in order. Work at flying a smaller pattern. Way too many pilots fly such a wide downwind and base that they have no chance of making the runway if they should have an engine problem. Fly final at 1.3 Vs and then shoot for a full stall landing at your intended point of touchdown. By doing this, you greatly improve your chances of a successful engine out landing should that situation arrive.

**Practice good radio discipline.** Have you noticed the absolutely non-professional radio transmissions on the Unicom frequency? Have you noticed the rambling wording on many transmissions? My suggestions are simple – engage the brain before you engage the microphone button. Keep radio chatter to a minimum by keeping your transmissions brief and informative. Remember at pattern altitude, your transmissions are heard over many hundreds of square miles. The Unicom frequencies are already very busy on weekends, so be efficient on your radio calls. For example, if no one else is in the pattern or taxiing out why tell the world that you are ~~—lear~~ of the runway". There are many other examples of wasted calls. For example, just the other day I heard someone call, ~~—Franklin~~ traffic, Cessna N---- is ten miles out." – Nothing else was mentioned. It sure would have been good to know that they were ten west or east or whatever. OK, off my soapbox.

**Get involved with a local EAA chapter.** Everyone is a national EAA member and understands what all they do for our rights to build and fly experimental aircraft, right? Well, get involved with a local EAA chapter to help support aviation in your local area. Why not fly your Lightning to an EAA breakfast and take a friend. Others in attendance will enjoy seeing your beautiful ~~—jet~~". Also, offer to give a presentation at a local EAA chapter meeting on what it was like to build and fly your Lightning. I guarantee it will be well received and will help spread the word on what a great aircraft it is. And while you are at it, make copies of the Lightning newsletter for your EAA chapter to read or even leave a copy

in your airport's terminal area or pilot's lounge.

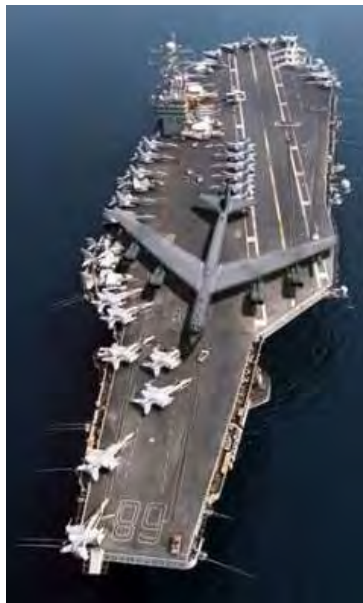
And lastly, **Plan on attending Sun-N-Fun and Oshkosh.** You will be glad you did. Attend the Lightning forums and the Lightning enthusiasts' gathering at the Arion booth. And while you are doing some planning, also plan to attend the next Lightning Fly-In at Shelbyville this coming September.

Blue Skies,

*Buz Rich*

[N1BZRICH@AOL.COM](mailto:N1BZRICH@AOL.COM) (Contact me directly for newsletter inputs – I need your help to keep this newsletter both interesting and informative.)

PS: Hey "World Record" Earl, tell us what is going on here? A new Navy secret weapon?



All, send in a caption for the photo above and the best one will be published next month.