




Arion Hangar Talk

The Arion Aircraft “Lightning” Newsletter.

July 2008

Volume 1, Issue 6

Welcome to issue # 6 of the  Newsletter. The goal of the newsletter is “to get the word out” on happenings at Arion Aircraft, and “to give a voice” to Lightning builders and flyers. It is your **Lightning “Hangar Talk”** sessions put into print. To be successful we will need the inputs from Lightning flyers and builders 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.

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And now, the rest of the news:

*By now you have heard the tragic news about **Jerry Van Heeswyk**. Please keep Jerry in your heart and remember him as a dedicated aviator and good friend that shared our love of flight.*

In Memory of

Our Good Friend and Fellow Aviator,

Jerry Van Heeswyk



Jerry and N62JV will now and forever be able to "slip the surly bonds of earth".

High Flight

Oh! I have slipped the surly bonds of earth
And danced the skies on laughter-silvered wings;
Sunward I've climbed, and joined the tumbling mirth
Of sun-split clouds - and done a hundred things
You have not dreamed of - wheeled and soared and swung
High in the sunlit silence. Hov'ring there
I've chased the shouting wind along, and flung
My eager craft through footless halls of air.
Up, up the long delirious, burning blue,
I've topped the windswept heights with easy grace
Where never lark, or even eagle flew -
And, while with silent lifting mind I've trod
The high untrespassed sanctity of space,
Put out my hand and touched the face of God.

*Pilot Officer Gillespie Magee
No 412 squadron, RCAF
Killed 11 December 1941*

Lead Story:

In May 2008 I finally flew back to Shelbyville to do a complete flight evaluation on the new 2008 Lightning factory demonstrator, N324AL. I had previously flown 324AL during the initial phase one test period, helping Nick get the hours flown off before its initial trip to Sun-N-Fun. Those flights were, by necessity, restricted to specific test profile mission objectives and thus I could not cover all the things I like to do when evaluating an airplane for the first time. Below are the results of my May flights in 324AL and hopefully will allow readers to get a feel for how the new 2008 Demo flies. And speaking of demo flights, I have already had the privilege of taking several potential customers for flights in N324AL. To say the least, it is a joy to fly and to quote **Nick** after his initial flight, "It is the best one yet."

Flight Report on the New 2008 Lightning Demonstrator May 2008 By Buz Rich

Experimental aircraft builders make the decision to build an airplane for many different reasons. But once they make the decision to build an airplane, the next big decision – and possibly the most difficult one - is which airplane to build. There are many factors that go into choosing a particular airplane to build, but if your decision process includes the following considerations - outstanding looks, fantastic performance, economical operation, and **quick to build** - then the Arion Lightning just might be the airplane for you. Please note the emphasis on quick to build. That is not necessarily the only market segment that the Lightning is aimed at, but it certainly should be a consideration if you don't want to take "years" to get in the air. And if you use their builder assist program your build time is measured in weeks. Fantastic!

I recently had the opportunity to fly Arion Aircraft's brand new 2008 Lightning Demonstrator aircraft, N324AL, which was built from one of their production kits. The Lightning is a fiberglass kit airplane that is produced and sold by a small group of dedicated EAA members in Shelbyville, Tennessee. Pete Krotje and Nick Otterback are the principal members that are responsible for designing and developing this relatively new design. Note: Pete's team is also Jabiru Sport Aircraft USA, which imports, markets and builds the Jabiru line of LSA aircraft and Jabiru engines.



As you can see from the pictures that accompany this flight report, the Lightning is a stunningly beautiful low wing single engine, two place, composite airplane that looks like it is going Mach 2 just sitting on the ramp. The design incorporates a bubble canopy for outstanding visibility and two small windows on each side of the fuselage aft of the canopy and this greatly enhances the ability to check towards six o'clock. It is powered by a 120 HP Jabiru 3300 engine and this combination of a relatively light weight clean airplane design, combined with the 120 HP Jabiru aircraft engine results in a sport aircraft with spirited performance that is economical to operate and an absolute joy to fly.

The new 2008 Lightning demonstrator had about 50 hours total time on it when I flew it for this flight evaluation in May of 2008. However, I had previously flown it during the phase one flight test period to help Nick fly off the 40 hours. Obviously I was not able to do a full flight evaluation on those first flights since we were following a very specific test profile on each test flight. Now that 324AL has completed phase one testing and has recently been to Sun-N-Fun (**where it won the best composite aircraft**) I could now do an evaluation flight looking at the flight parameters that potential customers would be interested in. Since it was built from one of their production kits, it is exactly what a Lightning customer can expect from their kit built Lightning.

First, let's cover a little history on this unique design. The original prototype Lightning (N223AL) was initially flown in early 2006 by the designer, Nick Otterback, and it was then shown at Sun-N-Fun and Oshkosh that year, generating great interest and a long line of potential customers that wanted a chance to fly the design. Since the only flying Lightning at that time was an experimental test and developmental prototype aircraft that only Nick had flown, it was obvious that Arion needed to build



one of their kits for that marketing purpose. Before proceeding with building a demonstrator aircraft, Pete asked me to fly the prototype to provide an "unbiased" report or a so called "second opinion" on its flying qualities and capabilities. The flight report that I wrote in July 2006 after flying their prototype was widely read on the Lightning e-mail list and resulted in quite a few folks committing to building this new design. That initial flight report, if you would like to review it, is available on their web site at: <http://www.flylightning.net/Support.html>.

Arion Aircraft did build a demonstrator (N323AL) and many of you have had rides in it. In July 2007 I also wrote a flight evaluation report on that aircraft, which was to be published in the EAA magazine. However, 323AL was recently sold and that required the building of 324AL, the newest demo.



Now, since I had flown the prototype and the first demonstrator, a flight evaluation in the new 2008 demonstrator would give me a chance to compare the three and to let potential builders read what they could really expect as to the flying qualities and capabilities of the latest production kit. At this point, let me reaffirm that I am in no way associated with the company that has developed and markets the Lightning (Arion Aircraft). I am, however, a very happy customer that built another kit airplane that they used to import, the Spanish designed VM-1 Esqual. The highly modified Esqual that I built was the second homebuilt that I have completed, the first being a Pitts Special that I flew for 29 years. Since then I have also helped our EAA chapter complete a Zenith 601XL. I have also made the first flight on seven different homebuilt aircraft designs and am a long time EAA flight advisor and technical counselor. I have also restored a few vintage aircraft, one of which was an Oshkosh Lindy Award winner, and another an Antique Champion at Sun-N-Fun. I spent 28 years flying fighters in the Air Force including 351 combat missions, many years instructing in the F-4, some flight and weapons testing experience, and an assignment on the initial F-15 Instructional System Development Team. Also, I have been an active EAA and IAC member since 1974. All total, I have flown over 100 different aircraft types. I feel blessed to have had the opportunity to experience aviation in so many exciting ways.

Most of you have probably heard the old saying, "if it looks good, it will fly good." Well I have to agree with that statement; the Lightning is a beautiful airplane and it absolutely does fly good, heck, make that outstanding. The new 2008 demo is also well equipped as you can see from the photo of the instrument panel and, additionally, it has a really nice and comfortable interior. Bottom line, the overall airplane is outstanding (the Sun-N-Fun judges agreed) and I love the way it flies. I think that you also will agree after you get a chance to fly this new demonstrator.



Now, here are some specifics on my flight in N324AL. Outside air temp for takeoff from the Shelbyville, Tennessee, 800' elevation airport was 76 degrees with a density altitude of 1742 feet. Because N324AL is equipped with a dual Grand Rapids EFIS, the OAT, density altitude, and true airspeeds are readily available. I had topped off the Lightning for the flight (30.4 gallons total, as 324AL has the new long range tanks) so I estimate a takeoff weight of 1220 with me aboard, which is 205 pounds below the maximum of 1425. Basically, N324AL with full fuel has a payload of 420 pounds which equates to two 210 pound "big guys" or if you need to load 50 pounds in the baggage compartment, you can carry 370 pounds of pilot and passenger. That is normally plenty of payload for a couple on a trip in their Lightning. If you chose to build a light sport compliant Lightning, your gross weight will be limited to 1320 pounds and with a full 30 gallons of fuel you will have a payload of 315 pounds. That could easily accommodate a 180 pound pilot, a 120 pound passenger and 15 pounds of baggage. However, builders that want a light sport version might opt for the regular 22 gallon fuel capacity in order to have a larger payload.

Take off was short and quick and the Lightning was airborne in approximately 500 feet. Runway lights helped me estimate this distance. I used 10 degrees of flaps for takeoff and after rotation I raised the flaps when accelerating through 75 and then used 87 mph (V_x) for my initial climb. Passing the end of Runway 36, I started a left turn and let the nose down slightly to let the speed build to 100 mph (V_y). Initial rate of climb was about 1200 feet per minute as shown on the VVI and when I got to 5800 feet it was still showing almost 1000 fpm. Total time to 5800 feet was exactly 5 minutes and 5 seconds, and that time was from brake release to 5000' AGL. That easily averages to 1000 fpm in my book. Darn good climb performance from brake release to 5,000 AGL.

Most of my test flight in the new demonstrator was done at 5,000 feet to find smooth air and the average OAT up there was 60 degrees with a density altitude of 5882'. After a few quick clearing turns to check the area and to get the feel for the airplane, I started doing several clean and dirty stalls. Clean stalls are quite nose high, but the nose drop at the stall is not violent at all. There is a slight but noticeable buffet about 4 to 5 mph above the stall, and then the nose falls through the horizon. The clean stalls occurred at between 53 and 54 mph indicated. Remember, I was not at the 1425 gross weight or the 1320 gross weight for the Lightning Sport Plane version, which will have VGs or wing tip extensions (soon to be available and to increase wing area) and thus lower the stall speed. On a later flight I also did some stalls at about 1,000 AGL and ended up with the same 53 mph clean stall speed. The new wing tips, which will add about 10 square feet of with area, should easily lower this to well below 52 mph which equates to 45 knots as required for light sport parameters.

Flaps down stalls were tried at 10, 20, 30 and 40 degrees of flaps. Stalls occurred at 48, 43, 36, and 36 mph for each of the flap settings listed. The pre-stall buffet for each setting again occurred at 4 to 5 mph above the stall and at each setting the actual stall was a rather mild break. All were basically straight ahead if I kept the ball centered. Here might be a good place to comment on how well the airplane flies hands off at both slow flight and cruise speed. The "factory guys" have recently started using a wing incidence tool when setting the incidence and the result of this extra effort is an airplane that flies straight.

The Lightning's flaps go down a full 40 degrees and I did some of the flap down stalls at 40 degrees and some at 30 degrees just to get a comparison. I really didn't note any difference in stall speed between the 30 or 40 degrees, but there is a big difference in drag when using the 40 degrees. The speed drops much quicker at 40 degrees and when you power up to recover it takes much longer to get a climb going. This could possibly be a problem on a last minute go around with 40 degrees of flaps selected, but it could also be a good thing to have in your "bag of tricks" if you need to do a steep approach to a short field. But, using 30 degrees would be a better choice for normal landings, and that is what is recommended in the pilot's operating handbook or "flight manual". Anyway, the "dirty" stalls were not nearly as nose high as the clean stalls, the slight buffet was still there to "talk to you", and the stall itself was pretty benign.

Slow flight in the Lightning is another "piece of cake" maneuver. When at normal cruise speeds very little rudder is required, but as you slow down, more and more rudder input by the pilot is required to insure coordinated turns. One other thing to mention, the Lightning rudder is very effective at all speeds and the aircraft slips quite well.

With the stall series out of the way, I could now play with the Lightning to better evaluate how it feels and performs. Just "tooling around" the sky doing various maneuvers at around 3,000 feet and indicating 150 mph or so, I was only burning about 5 gallons per hour, so this is one economical airplane to operate.

This point in the report might be a good time to mention the new trim tab system that is now standard for all future Lightning kits. The old bungee system worked, but was not nearly as efficient or responsive as the new set up which incorporates an aluminum tab on the right elevator, an electric servo to move the tab, and a cockpit indicator to show tab position. The new trim system is also maintenance free which certainly was a continuing problem with the old bungee system which needed lots of attention to keep it working properly.



Having quite a bit of time in Lightnings both before and after this new trim system was developed, I have to say it will be well worth your effort to install it in your currently flying Lightning. An “after the fact” retrofit is relatively easy and you will be very pleased with the results. The price that Arion is charging for the kit just covers their cost, as they want to encourage builders to convert to the new system. You will be glad you did.

One maneuver I like to do when flying and evaluating “sporty” airplanes and aerobatic biplanes, is to put it in a level steep turn at some airspeed to see if the speed falls off quickly, stays the same, or perhaps increases. This is my way to see how quickly an airplane bleeds energy when “loaded up” or to measure any possible excess energy. An interesting thing happened with the Lightning while doing this maneuver. At 120 mph, in a steep continuous level turn (probably around 70 degrees of bank – and yes, by FAA definition that is an aerobatic maneuver when over 60 degrees of bank), the Lightning just keeps on holding 120 indicated and pulling over 2 Gs to maintain a level turn. That’s pretty impressive. But what is more impressive is that if you push the power up the Lightning airspeed increases while still pulling over 2 Gs. No energy bleed here - definitely excess energy. This 6200 series wing was a great choice for the Lightning. As a side note, Arion Aircraft is not advertising the Lightning as being an aerobatic aircraft and I certainly agree. It is probably an insurance thing - but the airplane certainly feels capable of mild positive G aerobatics and it appears to be built quite strongly. However it is a very clean design and therefore speed builds very quickly when the nose is below the horizon. So beware.

Speed runs at 5000’ were about what I expected based on what Nick had briefed me on and the fact that I was at a pretty high density altitude. Nick and I are convinced that they still do not have the optimum prop on 324AL. They are flying with a Sensenich 62FK58, but are waiting for delivery of a 62FK60, which should be closer to what this clean design needs for better cruise speeds. The speed numbers below were what I saw on this particular day with a Sensenich 62FK58 wood fixed pitch prop: (2850 = 148 true mph, 2950 = 155, 3050 = 162, 3150 = 168, and 3250 = 175). The correct prop on a standard day should increase all of these numbers, possibly by as much as 5 to 10 mph. One other thought, although Sensenich thinks the FK blade profile and a 2” shorter diameter is the way to go, based on my experience on N31BZ, I am not totally convinced yet. Yes, the shorter FK props give more rpm on takeoff and thus a shorter takeoff roll (not that the Lightning really needs a shorter takeoff roll), and a slightly higher climb rate again because of the higher rpm, but in the cruise phase of flight I see no real advantage to the shorter prop even with more pitch. N31BZ’s cruise numbers with a ZK prop (of 2” more diameter and 2” less pitch) are slightly faster at the rpm ranges I normally cruise at than when I have the FK prop mounted. So more testing is still needed to determine the best prop for the “mission” that you have. Are you looking for absolute top speed or something more economical at a reasonable cruise speed?

I really like the way the new 2008 demo Lightning flies. The wing, a NACA 6200 series airfoil, provides a relatively smooth ride when down low in turbulence, yet it still accelerates good, has a good climb rate even on a hot day, and good cruise speed performance both down low and at altitude. The

Lightning's pitch forces are relatively light and have a sporty feel, but are not overly sensitive. Roll rate is hard to accurately measure, so I will just go on my past experiences and say that it rolls faster than a Cessna or Piper, and slower than the RV-3 that I have flown. Roll is much slower than my Pitts, but then most everything is, expect the fighters I flew in the Air Force. I would estimate roll rate at about 120 degrees per second, but then I could be off. Whatever it is, it is nice. Pitch and roll forces are well harmonized at 120 mph and below, meaning that the amount of stick travel and force required to move the stick is about the same for both. However, as speed increases, pitch forces only slightly increase while roll forces go up more - just like most high aspect ratio aircraft with relatively small ailerons. From what I remember of my RV-3 time, as speed increased, roll forces stayed light, but pitch forces went up somewhat. Again the different wing design (smaller span with larger ailerons on the RV-3) would cause this. Bottom line, the Lightning, as was the RV-3, is a delight to fly. It has a very sporty feel with very spirited performance while being very economical to operate. I feel confident that with the proper transition training, a pilot current and proficient in any "store bought" or "homebuilt" aircraft will quickly feel comfortable in the Lightning and love the way it flies and performs.

One other comment before I discuss landings. Just for "grins", near the end of the test flight I climbed N324AL to 14,500' MSL, and it still had nearly a 400' per minute rate of climb at that altitude. Note: the density altitude was closer to 16,000 feet.

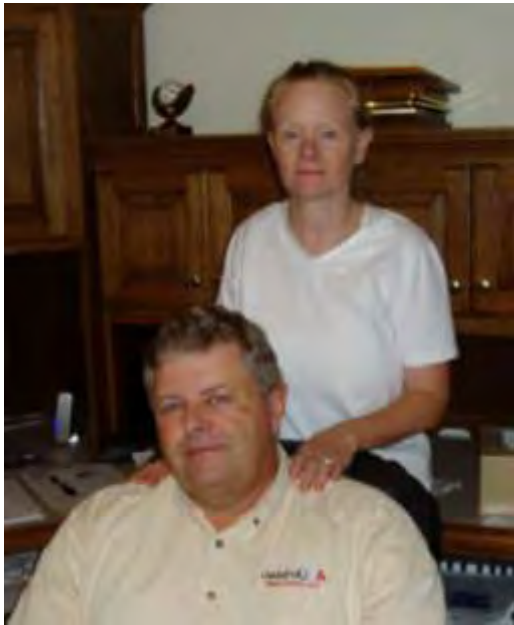
Landings are easy in the Lightning. It seems to "groove" on final, meaning that once you have the correct glide path and speed set up, small wind gusts and turbulence do not seem to have too big an effect on the Lightning even though this is a relatively small and light weight sporty aircraft. I made three landings, two using 30 degrees of flaps and one with 40 degrees. You can fly a steeper approach with the high drag that the 40 degrees gives you, but I feel that the 30 degree flap setting is a better choice for most situations based on my above comment about the possibility of needing to go-around. The touchdown is easy and there is not much float if your airspeed is on target. I used 60 mph on short final in the Lightning and I normally try for a full stall landing. Once on the ground it rolls out straight and you can easily make a 1000' turn off. If you want to use more brakes, you can stop much shorter. Overall, the landing is a "piece of cake".

I anticipate great interest in the "homebuilt community" in this relatively new beautiful design. It is priced below any "quick build" airplane with similar performance, it is easy to construct and can be completed in a short time. If you opt to use their builders assist program and build a standard version, you can expect to need only about three weeks of your time. Add to that the time it takes their painter to do his work and you will have your Lightning flying in about two months. Yes, you read that right - three weeks of your time and about two months total when you use their builder's assist program. The Lightning kit is also a "quick build" if you opt to assemble it on your own. Several kits that have only been in the builder's hands for between six months and a year are already getting close. Their builder's manual has lots of photos and is easy to follow. Over the years as an EAA Technical Counselor, I have looked at many different aircraft kit builder's manuals and I have to say the Lightning builder's manual is great. Also, the Lightning flight manual appears to be one of the best in the experimental aircraft arena. It has lots of overall detail and excellent normal and emergency procedures sections. Once you complete the performance section with flight details for your specific aircraft gained during your phase one testing, you will have a flight manual that is as good or better than any experimental aircraft out there.

So if you want an absolutely beautiful sporty aircraft design that you can get in the air quickly, really quickly, and have the occasional "need for speed", take a close look at this fantastic airplane. It has amazing performance on only 120 HP. All of these factors result in a fun to fly sport airplane that is very economical to operate and quick to build. Don't believe me? Call them and schedule a demo flight for yourself. The Arion Lightning - you will love it.

News from the Factory:

Before getting to specific news from the factory for this month, I thought it appropriate to “introduce” all newsletter readers to the “people” of Arion Aircraft. So below you will see photos of the Arion staff and thus be able to put a face with a name. Next time you call Arion, you will know who you are talking to or you will be able to recognize them when you see them at a fly-in. No, you don’t have to memorize their names; they wear name tags when at Oshkosh or Sun-N-Fun.



You might call the above photos the “**brains and beauties**” of Arion Aircraft. That’s **Pete and Barb Krotje** on the left and **Dana Otterback and Pete** on the right. They all look happy because they love their job – helping EAA members achieve the dream of building an airplane. I’ll let you decide which ones are the brains and which ones are the beauties. Actually two of them qualify as both.



To the left is **Chastity**. You have probably talked to her as she normally answers the phone at Arion. Another beautiful smile, so I guess all the people at Arion are happy.

To the right - look at the concentration on **Dana's** face as she drives the forklift. All of the Arion staff are "multi-talented" in that they can do about "anything" needed to get the job done. And no, she is not picking up her Mini Cooper to move it around the shop.



To the left is **Mark Stauffer**, Arion's **Potentate of Kits**, or **POK man**. If you have a question on the Lightning build manual or how they do a specific task at the factory, give POK man a call. **Mark** is another Arion staff member with many talents. Two things that most of you don't know about **Mark** is that he used to play the tuba in the US Army band, and second, he is a real craftsman at building aluminum aircraft (as well as composite ones). He plans to combine those two capabilities on the Zodiac 601XL he is building. He will use a tuba as a venturi tube on his 601 and be able to "toot his horn" while making fly by's.

You all know **Nick Otterback** as the designer, chief test pilot, and overall guru or the "**Grand Poobah**" of the Lightning. I consider **Nick** one of the best pilots I have had the privilege of flying with. He also has been known to do "fly by's" in one of his Corvettes or on his bike. (Note – **Dana's** bike is faster.) He and **Dana** are currently building a Skybolt when they can find the time in their busy schedules. On the photo to the right Nick is demonstrating a "full stall" landing in his office chair. I can just hear him saying, "Hey you all watch this; no hands."





“Moostang” Mike Jones, besides being able to do any task required to build a Lightning, is also the owner of a beautifully restored fast back Mustang. Ask him to tell you about the Nashville video that features his “ride”. Mike is another one of the “nice guys” that Arion is lucky to have working for them.

Bonnie, on the right, is Arion's parts department expert and manager. But, like the others, she enjoys getting out in the shop and showing the guys how to fabricate an aircraft part.



Important Oshkosh News

For those of you planning on attending Oshkosh, be sure to arrange your schedule while there so that you can attend the following three forums. Remember you can also order a CD with any forum presented during AirVenture for later delivery. I often do this when my OSH work or play schedule prevents me from attending all the forums that I would like to.

- First, on 31 July, at 1130 in the REMOS Aircraft Pavilion (#11), **Pete** will be presenting a forum on **“The Jabiru Engine”**.
- Second, on 1 August at 1130 in the REMOS aircraft Pavilion (#11), **Nick** will be presenting a forum on **“The Lightning LSA and Lightning Kit Plane”**. He will cover an overview of the design, construction, performance and future plans for S-LSA certification of the Arion Aircraft Lightning.
- Third, on 2 August, at 1600 in the Poly Fiber Pavilion (#10), **Pete** will be presenting a forum on **“Jabiru Light Sport Aircraft”**.

Update on the new Wing tip extensions

The following message to the group was sent out on the 11th of June by Nick. Basic flight testing for controllability and flight characteristics has been completed by Nick, but still to come are test flights to determine performance parameters for such things as stall speeds, cruise speeds, climb speeds (best rate and angle), glide speeds (both distance and loiter time), and service ceiling. As you can see, flight testing a new change to an existing airplane it is not just a matter of attaching the new part and then going flying. See photo below.

We would like to let everyone know that the wing tip extensions are now for sale and ready to ship. The cost is \$495 for the set and will be either a direct bolt on or glass on as you prefer.

These tips are still undergoing performance testing but have been proven to be airworthy and not have any adverse effects except maybe a slight decrease in cruise however we have not re-installed the speed kit nor the go-fast prop at this point as the prototype is still in a sport configuration. We will try to have the performance numbers out next week. If you are building the Lightning to meet sport rules these tips are the way to go. The only drawback for a go-fast Lightning may be the drop in cruise at low altitudes, but we will see next week.

Nick Otterback

Arion Aircraft, LLC



As a follow up to Nick's flight report on the new tips, I flew two sorties on the prototype on 24 June to provide some additional thoughts on the flight characteristics of the new tips. Let me start out by saying I think they are great – both great looking and the performance enhancements are well worth the effort. For those wanting to fly their Lightning with a Sport Pilot License, they are the “only way to go”. Others may want to include them also because of the performance enhancements and “good looks”.

My two flights in the prototype with the new tips convinced me that “when” I build a Lightning I will definitely use them. Although performance data is still being collected, I gathered enough data on my flights to show me that they are well worth the effort whether or not you are building your Experimental, Amateur Built (EAB) Lightning to meet light sport requirements.

One concern I had before my flights with the new tips, since they add not only wing area but increase the span as well, was the possibility of spiral instability in a steep turn. Some aircraft in a steep turn will want to “transition on their own” to a descending spiral with an ever increasing bank angle and lowering of the nose with an increasing airspeed. Let me say that there is absolutely no tendency for spiral instability with the new tips. I tried various bank angles both left and right and saw nothing that made me think there was any possible spiral instability. I am happy to report that the new tips are probably more stable than the original tips and I think the reason is the winglets that are incorporated. Basically what I saw at a

60 degree bank (both directions) when I released the stick (throttle was a little above idle) was that the bank stabilized at 60, airspeed stabilized at 140 mph indicated, and the VVI settled in at 1500 feet per minute descent. When I say stabilized, that is exactly what I mean. There was absolutely no inclination for the bank angle to increase. In reality, I think that these tips provide more stability in a descending spiral than do the standard wing with the standard tips because of the stabilizing effect of the winglets. So they not only look better, but they provide better flying characteristics.

I am sure the first question everyone will have is: How much did the new tips lower the stall speed? Referring back to my initial flight evaluation on the prototype in July 2006 which was flown below the max gross weight of 1320 pounds for the light sport version of the Lightning and certainly well below the 1425 for the standard Lightning, I saw clean stall speeds of around 49 to 50 mph (remember this was not at gross weight). Later flights in the prototype without the new tips and with the aircraft loaded closer to gross weight showed a clean stall of about 53 mph. This number (53) is also what I have seen on previous flights in both of the Lightning demonstrators (N323AL and N324AL) when near gross weight, so I think it is safe to call the standard Lightning stall speed as being about 53 mph. On this most recent flight which I added ballast to the right seat to bring N233AL as close to 1320 pounds as possible, the stall speed was a consistent 48 mph. The stall itself was kind of a non event in that, although the nose was high, there was ample pre-stall buffet and then at the stall the aircraft nose just kind of fell through with no drastic break. Keeping the wings level with rudder, the aircraft just kind of went into a "falling leaf" maneuver. It was nothing drastic at all and there was no major loss of altitude. Adding just a little power had you flying again. At anything above idle power you could pretty much slow fly the aircraft with full aft stick, again keeping the wings level in the buffet with the rudder. All in all, the new tips effectively lower the stall speed so that an EAB Lightning built to meet light sport standards will have no problem meeting the 45 knot (52 mph) clean stall requirement.

During my second flight with the new tips I tried to get some valid performance data, but due to the hot bumpy day it was hard to gather exact data, so more flights will be required to nail down the specifics. However, below are some of the "numbers" that I came up with. Even though it was a really hot afternoon in SYI (90 degrees F with a density altitude of 2600' at the field elevation of 800'), take off roll was well short of 500'. Actually, I am thinking something like 250 to 300 feet. Climb out at the normal Lightning Vy of 100 mph produced something in excess of 1200' per minute. Again, it was hard to hold a good steady climb speed because of the strong thermals. Also, additional Vx and Vy testing will probably result in slightly different numbers because it is a "bigger" wing. (Same thing for best glide speed and best loiter speeds, although I did some quick timed test for all of these).

Before I go on, I need to let you know that the prototype configuration for these flights was without main gear wheel pants or gear leg fairings. The nose gear pant was on as was the nose gear leg fairing. The prop installed was a wooden fixed pitch Sensenich 64ZK54. So all numbers, especially speeds, will improve with the addition of wheel pants and gear leg fairings. Of course if you are worried about exceeding the max continuous rpm cruise speed of 120 knots (138 mph) at 2850, then you might not want to install these.

At 5,000 feet on this hot day WOT (wide open throttle) resulted in 3150 rpm and after running several speed triangles, the true airspeed in mph worked out to 151 TAS. At 2650 rpm the speed was 127, at 2750 the speed was 131, and 2850 resulted in 138 mph TAS (the magic number for light sport). Obviously drag reduction efforts like fairings and wheel pants will increase the WOT rpm and all speeds. Note, these numbers are only about 5 to 8 mph less than the new demo with wheel pants and gear leg fairings installed. A really cleaned up Lightning with the new tips might even prove to be faster than the original tips. At some point Nick will reinstall the pants and fairings and put on a go fast prop on the prototype to find actual speed numbers in this configuration. All he needs is more time in his busy day.

At 10,000 feet MSL the prototype with the new tips still had almost an 800' per minute climb rate even on this hot high density altitude day. And remember I was only guessing at a V_y number to produce this rate of climb. Also remember that the higher you go V_x and V_y get closer together and you should start using true airspeeds instead of indicated airspeeds to get your best performance. WOT at 10K was 3080 rpm and after running several wind triangles the speed averaged out to 149 TAS.

Due to the really "bumpy air" for my second flight I hesitate to give much validity to the following data, but for what it is worth, V_y plotted out to be something like 83 mph or so. (Note: this is much lower than the V_y normally seen for the regular wing Lightning, and maybe should be taken "with a grain of salt" because it is based on only one flight on a really bumpy day.) I gathered this data by timing my climbs at various speeds to climb 1000'. Obviously it is hard to hold a steady climb speed in the bumpy air and I could feel a "kick in the butt" climb increase or decrease as I flew in and out of thermals. As Nick and I have seen in other Lightnings and Esquals, there seems to be a second V_y at something like 115 for this wing. (Many of you probably found the same thing on your Lightning with two V_y s of 100 and 115 if you actually did lots of V_y plotting during your phase one testing). I fly my airplane taking advantage of this situation by using the 87 V_x after takeoff (until the end of the runway) and then transition to V_y of 100. If I am going high for a cross country flight, I then transition to the second V_y of 115 for a cruise climb. Both numbers result in something above 1200' per minute initial climb rate for N31BZ. But remember that I live close to sea level.

I also looked at best lift over drag (L/D) by timing my time to glide down 1000' at various airspeeds and this resulted in a best loiter speed that plotted out at about 60 mph. Additional tests will need to be run with various flap settings. Also, we (you) will need to do lots of runs to find the best glide speed for distance. I am thinking that the new wing tips will probably raise the glide ratio to something like 19 to 1 instead of the current 17 to 1 for the standard Lightning. Nick has actually shut the engine down on the prototype with the new tips and was able to soar it for some time while at 6,000 feet above SYI. But you really have to slow down to get the prop to stop wind milling for lowest drag. I have done the same in N31BZ on one occasion just for grins.

My bottom line on the new tips: they hit the target on both looks and performance in that they do exactly what they were designed to do. For those of you that want you EAB Lightning to meet light sport requirements I consider the new tips so much better than going with vortex generators to lower the stall speed. Besides, the VGs remove some of the pre stall buffet that really helps to know when you are nearing the stall. You also don't have to worry about the VGs coming "unstuck" and coming off in flight or when you are cleaning bugs off of the leading edge of the wing. Or do you use the bugs as VGs?

Two Lightnings are currently being built with the new tips. Wayne Lenox (photos below) should have his airplane flying before you read this. His inspection is scheduled for 26 June. Lynn Nelsen's Lightning is currently in the paint shop and has the new tips as well. Hopefully both of these guys will share their phase one test performance data with the rest of us after they complete flight testing.

On the right and below are photos of Wayne Lenox's new tips as of 24 June. The tape you see is holding on the strobe lights while the epoxy sets up. Wayne is the first Lightning customer to use the new tips and has glassed them in place. Lynn Nelsen will be the



second Lightning to use the new tips. His airplane is in the paint shop as this is being written.



Above is Nel's personal pilot.

Factory Assist Build Update

Photos of Wayne's Lightning were taken on 24 June while I was in SYI to fly the prototype with the new tips. As you can see, Wayne's airplane is progressing nicely and should fly late June. The following message explains who came up with Wayne's paint design.

Buz,

Nel did all the paint design and color. Also the interior!! For the wing tips, they will be on permanently. Mark, Mike and Nick put the wings back on to align the wing tips. I was not there. I will try to keep you up to date.

Wayne



Latest photo of Wayne's Lightning from 26 June shows it ready for the first engine start and FAA inspection.

Sales Update

While I was in SYI the latest Lightning kit was sold to **Paul "Bear" Bryant** of Florida. "**Bear**" has been thinking about buying for some time now and was at the first Lightning Fly-In last September. Welcome aboard "**Bear**". He is scheduled to start his build process this September. I think this brings the latest number of assigned serial numbers up to 75. That is great sales performance for a company that started up not too long ago.

News from the Dealers:

Lightning Australia

From: Lightning Aircraft Australia [mailto:lightningaustralia@bigpond.com]
Sent: Monday, June 02, 2008 2:54 AM
Subject: First Flight

Hi guy's , just to let you know S/No 32, built by **Mr. Anthony Morrison** of Latrobe Valley, Victoria , AUSTRALIA, Had its **first flight** today 2-06-08, PM.

Regards, Dennis
Lightning Aircraft Australia

Then on 22 June I got this additional message from Dennis about Anthony's airplane.

Hi BUZ, Just received some photos of **Anthony Morrisons** Aircraft No 2 to fly in Australia. Anthony runs a flying school in Victoria Australia. We have another 6 Lightning Kits arriving in July which will make No 21 into Australia, also a builder assist we are doing for Mr. Peter Mitchell of Western Australia & that aircraft should be flying early August . There are several more that should be flying this year. Last week we received 10 new trim systems & fitting the first in our current builder assist. the next being our Demo. Spoke to Peter Disher last week & he is currently working on the electrical system, so he is is not far away from flying. We have some exciting things happening to some of our Jabiru engines for the Lightnings which has been developed by one of our builders, more news on this another day. We hope to start on our new Demo in Aug- Sept 2008.

Hope you are well BUZ & keep up the good work.

Regards, Dennis.

Note: Below are two photos of Anthony's Lightning.



Lightning North Central

The following message was put out by Nick on 25 June (while I was flying back to Virginia from Tennessee) and indicated that yet another Lightning has “left the nest”. Tom and Al (or Bill), how about sending some photos of this new Lightning. Also invite me to your next hangar party during Oshkosh (hint, hint).

To Group:

I believe a new Lightning has parted ways with the earth. Reports are in from the great white north, with the snow gone and the water going elsewhere that Bill Browns piloted his ship for a while last night from H&S aviation in WI. I hope we get a bit of a pilot report from him soon...Nick Otterback

And from the UK

After years of work and frustrations with England’s rules for homebuilt aircraft, Clive James reports that his Esqual powered by a Jabiru 3300 has finally taken to the air. Congratulations, Clive.



Current Lightning Dealers:

Arion Lightning, LLC, contact Nick Otterback, Shelbyville, TN, 931-680-1781, www.flylightning.net

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

Green Landings Flight Center, Ryan Gross, Hedgesville, WV, 304-754-6010, www.greenlandings.com

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

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

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

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

News from Builders and Flyers:

The article below is by Lightning builder (and soon to be flyer) Jim Langley. His ideas about instrument panel design, instrument selection and cockpit management are well thought out and may help those just now thinking about how to equip their airplane make the decision to “go glass”. Below is his Lightning built at the Green Landings facility.



What good is glass anyway?

By Jim Langley

I think about what embodies the spirit of the EAA and as pilot/builders, what drives us to build the things that we build? It is just like my radio control days; some people live to build, some live to fly. Then there is the occasional “pilot” who shares equal time between the two. That is kind of my world. I love to fly, but the engineer in me loves to tinker. The EAA gives me the guidance and encouragement to do both.

So what’s this have to do with glass anyway?

Let me answer that question with a question. Do you fly with your head outside the cockpit? Are your instruments just a reference, or are they the primary source of information? Ok, sorry, that was two questions, but where I’m going is that when you climb in that seat, flying is all about enjoying the ride; at least for us non commercial pilots anyway. Are you building an airplane that requires so much interior attention that you miss the world that you are flying in? Think about this... The instruments that you pick should reduce your workload IN the cockpit so that you can spend more time OUTSIDE of it. I was talking to a guy in my local EAA chapter who after explaining to him about what I was doing with my panel, said “you don’t need that glass in there, You just need some good old steam gauges and GPS and you’re good to go”. Ok, but this is the same guy who installed two GPS units in his cockpit; one normal use and one for a backup. Ever hear of a chart? I happen to know that he flies with his head stuck inside his cockpit. He loves to compare his position on one GPS to the other; fun, but watch out for that bogey at 10 o’clock!

So why did I pick the glass that I did and not just put a six pack in my panel. Well, remember I said “reduce the workload”. My glass is configurable, easy to use and supplies all the information that I need

in one centralized place. Granted, you need to be a little computer literate if you want to program it yourself, but again, that is my world; EAA remember? I will carry some backup gauges and charts. With my system though, I won't need the chart unless I need a backup. Heck, I can even flight plan on the thing, and if I get tired of steering, it will automatically pilot the aircraft for me' but that's not as much fun as flying the airplane myself, remember?

So, with my choice I get the best of both worlds. Something to tinker with, creating new ways to display my flight information, and the freedom to fly for fun while enjoying the view.

Work less play hard, have fun.

Jim!

N730AL

By the way, do you want to know about what I put in my panel? Read the newsletter next month. I'll tell you all about it! See the photo to the right.



This next message is from a new Lightning owner, Jack Benson from New Mexico. Jack recently bought Ryan's Green Landings Demo aircraft and below are some of Jack's thoughts after flying it from West Virginia to New Mexico.

Buz,

A delayed thank you for providing me with the information on obtaining a copy of the Lightning POH. As you no doubt remember, I purchased Ryan Gross' Green Landings demonstrator.

As to my decision to buy a Lightning. Should you care to, you're welcome to use any of these comments in your newsletter.

After some years of military flying, I tried sailplanes for several years. From there it was a Mooney 20C for three years, a Grumman Tiger for seven years, and, lastly, a Commander 112 for five years. The vast majority of my flying has been cross country.

Last fall, after getting curious about the LSA business, I decided to change my MO – cut down on the cross country and get into a "fun" airplane. The option of not renewing my FAA physical, should I choose not to; the fuel savings; and, hopefully, less maintenance were also decision factors. Of importance, of course, was that the airplane be either LSA, or, capable of being modified into LSA legality.

Ray Willis, Eagles Nest, Florida, was kind enough to give me my first Lightning (Esqual) ride. That prompted me to attend the January 2008 LSA get together at Sebring.

Of the many nice aircraft there I got hooked on the Lightning. It was the best looking plus it had the Jabiru engine (a big plus, in my estimation). Pete and Nick were very gracious with their time and answered my many questions. They were showing Jim Goad's airplane – I was impressed. Later, I had several telephone conversations with



Jim relative to the Lightning's various attributes.

Not choosing to get into the airplane construction end of it, I initiated a search for a completed, flying Lightning. Ryan Gross' Green Landings demonstrator was the only LSA-eligible one I could locate in the country. The rest is history.

Ryan offered super hospitality and went out of his way to install some add-ons I wanted as well as providing a professional aircraft check out. Green Landings Lightning owners Buddy Carlisle, Juan Sonen, and Jim Langley were very helpful, sharing building and flying experiences with Joyce and me.

Joyce and I picked up N414GL in Martinsburg, WV and arrived at its new home in Silver City, NM – 15 plus hours and 1,550 nm later. Two legs on Day 1, three the second day (to get ahead of weather), and two the third. All systems worked fine. Fuel burn was 6.7 gph at 2850 turns cruise (and a lot of climbs). Cruise altitudes varied from 4,500 to 10,500. A very responsive aircraft and fun to fly – an excellent choice; and, certainly capable of extended X-country should I want to. The only negative aspect was the necessity to hold forward stick all the way – 45 pounds of baggage and its resulting aft CG loading. I'm in line at Greg Hobbs, Southwest Lightning distributor (Marana, AZ), to have the new trim system installed. Greg has been very helpful in offering words-of-wisdom on Lightning ops. Thanks, Greg.

Should the many questions and "that's a great looking airplane" comments I received at every stop on the X-country, plus, a repeat from local pilots, be an indicator, future Lightning sales should be very positive in the months and years to come.

Jack Benson
N414GL
Silver City, NM

Tex Mantell sent the following message to the list on 20 June. Under Tex's message is a response by Pete Disher of Australia.

I guess everyone is still pondering the accident and there has been little to talk about. I have some questions and would like to see some talk going on as I am moving forward with my project.

1. Has anyone come up with a good tie down method for the lightning?
2. Which side did you all put your wing light and why?
3. How much drag do you think the wing light produces?
4. I hope to get the base of the air speed unit flush with the bottom of the wing. This should help reduce some drag. Every little bit helps.
5. Who all are going to Oshkosh?

Tex

Hi Tex, just a few shots as to what I did, bent some 1/8 angle and fixed them to the main spar in the area of the aileron bell crank, and used SS "I" bolts.

Pete D
VH-PDI
Kit #30



Upcoming Events:

Oshkosh is 28 July to 3 August. Several of you have indicated to me that you are planning on attending Oshkosh with your recently completed Lightning this year. I am hoping that we have between five and ten Lightnings attending, so start your planning process now. As I mentioned in the first newsletter issue, **Bill Hubbard** was at Oshkosh in 2007 and that qualifies him and his “jet” as a part of Lightning history, as his Lightning was the first Arion customer aircraft to attend Oshkosh. There will be a Lightning forum this year by **Nick** on 1 August at 1130 in forum pavilion #11. Also, **Pete** will be giving a presentation on the Jabiru engine on 31 July at 1130 in the same pavilion.

Flying to the world’s greatest air show is not without its challenges. And every year we unfortunately learn it can also be unforgiving to the unprepared. So here are some things to do and think about so that you are prepared for this fantastic aviation event.

1. Know the NOTAM. It is imperative that you know both the arrival and departure information. Study the NOTAM ahead of time (don’t just have a copy in your cockpit). See NOTE below.
2. Have a Backup Plan. Weather, parking saturation, other airplanes’ emergencies on the ground, and a host of other possibilities make it wise to include planning for alternatives (and having the fuel to exercise them) when flying to Oshkosh. So have a divert plan and alternate airport (or airports) in mind and plenty of fuel aboard when you arrive in the Oshkosh area.
3. Airspeed Control. Flying into Oshkosh you’ll be expected to fly precise airspeeds. Work out the power settings and flap use ahead of time to be able to fly the published speeds and fit into the flow of vastly dissimilar airplanes.

NOTE: For those of you that are planning on flying to Oshkosh, the arrival NOTAM is available at http://www.airventure.org/2008/flying/2008_notam.pdf. I normally get there much before the NOTAM takes effect, but I know that there are some changes from previous years. So get a copy of it now and study up so you are ready to fly into the “world’s greatest aviation event”. It would be great to have a good showing of Lightnings attending this year. Who wants to be flight lead?

Next Jabiru Engine Seminar (that is not “sold out” already) **is 5 to 7 September.** Call **Dana Otterback** at Arion in Shelbyville to sign up. I have attended this seminar and I consider it a “must” for anyone with a Jabiru engine or anyone considering one. It is money well spent.

The 2008 Lightning Fly-In will be 27 September at SYI. This is the second annual event and you should start planning now to attend. Those attending last year had a great time. This is a fly-in for anyone that is interested in the Arion Lightning, not just those that are building or flying Lightnings. Good food, hangar talk, demo rides, informational briefings, and other “fun” activities are on the schedule. There will also be a “**Metal Aircrafters Anonymous**” meeting chaired by **Mark the POK man**.



Lightning Skunk Works:

There are some interesting things currently happening in the Lightning Skunk Works as listed below:

First off, many of you have probably heard that the FAA is reviewing the 51% rule which may potentially have a big impact on future Experimental Amateur Built (EAB) aircraft kits. This new rule may be out as early as this October. Kits started prior to the new rule should not be affected by any change to the current rule. If the current Lightning kit is “judged” to not meet the new 51% rule, then Arion will either have to increase the builder workload by “undoing” some of the work that is already completed in the current kit, or come up with some other way to keep selling Lightnings. This second way to keep selling Lightnings is already in the works. In September, Arion will begin construction of the first ever Lightning that will be a **Special Light Sport Aircraft (SLSA)**. Remember an SLSA aircraft is a “turnkey” store bought airplane. During the Lightning SLSA “build process” it will be certified to ASTM (American Society for Testing Materials) standards so that when completed it will be basically a “turnkey” certified SLSA Lightning. The specific ASTM standard that has to do with the design and performance of light sport aircraft is F2245. Once a company builds at least one SLSA to ASTM standards, then that company can then start building **Experimental Light Sport Aircraft (ELSA)** aircraft than can be any percent complete when the builder/owner comes to complete the aircraft. Stay tuned for additional information from Arion as they embark on this new Lightning ELSA option.

The second new skunk works happening has to do with the photo to the right. Just what is in that crate?



And lastly, what are these “tundra” tires doing in the Lightning hangar? In the past some “free thinkers” have asked for tail wheel Lightnings, open cockpit Lightnings, float equipped Lightnings, twin engine Lightnings, four seat Lightnings, VTO and landing Lightnings, and even a Lightning blended wing design with round the world capability. All of these designs have been looked at (some more than others) so you know that Arion is a “can do” company. So are they now working on a “bush” Lightning with tundra tires?



Technical Tips

This is a new section that may become a permanent feature if the demand is there and I get enough “quality technical tips” to pass on to our readers. You can thank Arion employee Mike “Moostang” Jones for this first tip. He wanted to be sure he got the prop back on correctly when he was reinstalling it so he came up with this solution. For a part time Ford mechanic, I think it is a pretty simple technical tip. Mike deserves the “Arion Employee of the Month” award for this suggestion.



Reader Feedback:

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

The first email is from Jim Hausch of Wisconsin and he discusses his impressions after a visit to Arion in Shelbyville and his flight in the new 2008 Demo. Here are Jim's words:

Hi Buz,

Great newsletter. I've enjoyed every issue.

I have joined my wife here in Nashville while she's attended a conference for her job. We arrived Wednesday. Thursday morning while she went off to explore the exciting world of enterprise software for colleges and universities, I drove down to Shelbyville to visit Arion Aircraft.

Nick was very helpful taking time out to discuss the Lightning, but the demo ride would have to wait for the overcast to burn off. Also waiting for the same was a photographer for Kitplanes magazine – which I thought was pretty exciting news, too.

Since it was going to be a while and most of my questions had been answered, I detoured down to Lynchburg for a tour of the Jack Daniel's distillery.

I got back to Arion around 3 or so and went for the demo ride. Here are my impressions:

I am “undertall” (as opposed to “overweight” <grin>) – 5’9” and 205. I fit fine.

The fit and finish on the demo was very nice.

This was my first up-close-experience with a Jabiru engine. I was amazed at how quiet and smooth it was.

Sensitive in Pitch – this has been mentioned before. I'd probably “gear it” to be a bit heavier in pitch as a matter of personal preference.

I was impressed how very little adverse yaw it demonstrated in turns.

Nick showed me some formation flying with a Jabiru (giving you credit for the fine formation instruction)

It seemed very stable on approach and the fact that it has such a low Vso and approach speed but still such a high cruise is still very impressive to me.

I think this is the bird for me (us). I'll probably buy the fuselage sub-kit within the next 12 months. Since I live in WI, I'll probably next visit Tom in Neenah and maybe make a trip to the fiberglass shop if they'll let me.

Since you requested some thoughts on the ad:

- Put a small image in the corner showing the kit components as delivered
 - o the level of completeness will drive many to the website for a closer look.
- Here's my idea for the caption
 - o “All 3 can go over 150mph, only 1 gets 30mpg doing it” (or something similar)

Thanks,

Regards,

Jim Hausch



This next message is from Craig Sumner who recently bought one of the last Esquals built. It had originally been ordered and built by O.E. Moon using the builders assist program, but before O.E. could fly it he was tragically killed in a tractor accident at his home. Craig and O.E. had worked together in the past at NASA and now Craig and his son will be able to honor their friend by flying the airplane he built. I will include some of the photos that Craig attached to the e-mail.

Buz,

I do not remember if I sent you the photos from our work day on the demonstrator. Just wanted to make sure you had a copy! I really have learned a lot from your newsletter and the Lightning Forum. Also learned a tremendous amount of info on the Esqual on the day I spent with you at Arion. Nick and Mark have my Esqual back together after fixing the fuel leak. I am really looking forward to having them complete the Phase I and Phase II flight program. My son and I could pick up the plane after the Phase I checkout and complete the Phase II ourselves. The unfortunate accident out west has a higher priority than mine, but I am looking forward to getting out of the Build Center at Arion. I have been flying Cessna airplanes to build a little proficiency and just enjoy flying. We will take all the necessary time to transition into the Esqual when the time is right.

Thanks again for the Esqual flight manual! We have it in a notebook and have been studying the contents in our free time. Best wishes and continued safe flying Buz!!

Craig E. Sumner
Chief Engineer,
Space Shuttle Propulsion
Elements
United Space Alliance
544-3683 Office
653-8005 Cell



256
256



Above are Craig Sumner's photos showing his new Esqual and some last minute work on the new 2008 Lightning Demonstrator.

Next is the latest “tell it like it is” from Mr. Scotty.

A guy was driving around the back woods of Tennessee (probably near Bell Buckle) and he saw a sign in front of a broken down shanty-style house: **"Talking Dog for Sale "**

He rings the bell and the owner appears and tells him the dog is in the backyard.

The guy goes into the back yard and sees a nice looking Beagle sitting there. "You talk?" he asks.

"Yep," the Beagle replies.

After the guy recovers from the shock of hearing a dog talk, he says "So, what's your story?"

The Beagle looks up and says, "Well, I discovered that I could talk when I was pretty young. I wanted to help the government, so I told the CIA and they had me sworn into the toughest branch of the armed services...the United States Marines. You know one of their nicknames is "The Devil Dogs."

In no time at all they had me jetting from country to country, sitting in rooms with spies and world leaders; because no one figured a dog would be eavesdropping. I was one of their most valuable spies for eight years running, but the jetting around really tired me out, and I knew I wasn't getting any younger. So, I decided to settle down.

I retired from the Corps (8 dog years is 56 Corps years) and signed up for a job at the airport to do some undercover security, wandering near suspicious characters and listening in. I uncovered some incredible dealings and was awarded a batch of medals. I got married, had a mess of puppies, and now I'm just retired."

The guy is amazed. He goes back in and asks the owner what he wants for the dog.

"Ten dollars," the guy says. "Ten dollars? This dog is amazing! Why on earth are you selling him so cheap?"

"Because he's such a bull shitter ... He never did any of that shit. He was in the Navy!"

Other Items:

The following words were partially “stolen” from an article written by a good friend of mine, **Tom Turner**, of the American Bonanza Society (ABS). Tom is a master CFI, works for the ABS, and has published many safety articles. I have edited much of what he says below so that the information covered only applies to our type of aircraft: single engine, fixed gear, fixed prop. I have also added many of my own thoughts to his article to give you some things to think about if you have an **engine failure in flight** and what your thought processes should be at the time. Next month, if I find the time, I will expand on appropriate actions for an emergency landing should you not get the engine restarted.

As with any in-flight emergency the first and most important thing is to maintain aircraft control, or most succinctly put, **fly the airplane**. After that, if you have the time, you can analyze the situation and take the appropriate actions. Below are some thoughts on analyzing the situation and taking appropriate actions.

If an engine failure can be “fixed” in flight, it will be by “correcting” at least one of the three things an engine needs to develop power: fuel, air and ignition. Although many airplanes’ Pilots Operating Handbooks (Flight Manuals) have complex troubleshooting and restart checklists for rough-running engines and total engine failure, they all boil down to these three items. Depending on the type of engine (carbureted, pressure-carb or fuel injected), you may need to be concerned first about air (carb ice) or fuel (fuel injected and pressure carb).

Aircraft with multiple fuel tanks should have “check fuel” sources high on the restart checklist. And since the Lightning is a low wing airplane, you should **NEVER** have both tanks selected at the same time if your airplane has that capability. Doing so opens the possibility that you will “flame out” with fuel still on board when one tank runs low on fuel. Why? Well, what is easier for the fuel pump to “suck” – fuel in a tank or air in an empty tank? It has happened and will likely happen again that a low wing airplane’s engine “flamed out” with fuel in one tank with both tanks selected. Don’t let it happen to you.

Remember, historically most engine failures result from fuel starvation (running the selected fuel tank dry) or fuel exhaustion (running all tanks dry). Carburetor ice is also a common cause in carbureted engines, although the Jabiru engine does not seem to be particularly prone to carb ice (however my J3 Cub is a totally different story). It is still a good practice to use carb heat when at low power setting for any length of time.

If you have an engine failure and do not have enough time (altitude) to attempt a restart, or your restarting attempts fail to restore power, **remember that best chances of “arrival” without injury come from achieving three goals: touching down under control, with the wings level, at the lowest possible speed (or energy level to be absorbed by the earth).** Anything other than proper speed / pitch / attitude / or angle-of-attack control makes it highly unlikely you’ll achieve any of those three goals. Next time you practice engine-out procedures get a feel for the aircraft’s attitude (visual reference) that results in your best glide and least-rate-of-descent speeds straight ahead and in turns. See the Emergency Procedures section in your Lightning’s Flight Manual or Pilot’s Operating Handbook for the target airspeeds. And remember, part of your 40 hour FAA phase one test period is to learn what the best speeds are for your particular aircraft.

One more thing, it’s vital to get the nose down to a glide attitude and to maintain adequate airspeed for lift and control. You absolutely don’t want to stall. Stalling is falling, and that is not the way to arrive with the least energy to be absorbed by the earth. Practice your engine out procedures at altitude so you know what the proper glide looks like in your airplane. Know your best glide speeds and configuration for both maximum loiter time and for distance traveled across the ground.

In my aviation past I have had several engine failures, but luckily only one was in a single engine airplane. I fly a pretty tight pattern (many hours in a Pitts Special) and so when I lost the engine in the Cub I was in a position to make the runway. All my other engine failures were in the F-4 which McDonnell Douglas had the good sense to put two engines in. Most were combat related and of course I was able to return to base with the other engine. However in one situation I had a double engine flame out and it took quite a bit of time (altitude) before I got one of them restarted. Had I been “smart” back then the double engine flame out would never have occurred, but how do you tell a young fighter pilot that you should not jerk both engines out of full afterburner when at 63,000 feet. And, no I was not wearing a full pressure suit. Yep, young “full of piss and vinegar” fighter pilot that wanted to see just how high a Phantom would go. Buy me a beer sometime and I might tell you the entire story. Oh yes, and ask Nick about his first “air to air” kill in the Lightning. He landed engine out and made it look easy.

Fly safe and have fun. More next month on landing with “engine out”.

Final Thoughts:

For those of you that fly “store bought” airplanes such as Cessna and Piper, here is a Latin phrase for you: **ad astra per alia porci**. That translates to: **"To the stars on the wings of a pig"**.

Yes, I also own and fly a Piper “porci”, have owned a Cessna and several Beeches, so don’t get your boxers in a wad. This is just another of my vain attempts at humor.

Final thought number two. There is an excellent chance that the August issue will be late by about a week. Why, because Oshkosh is not over until 3 August. I will need to get home and write up things I see and hear while there, so I am guessing it will be at least a week late. I really would appreciate inputs from all of you, not only for the August issue, but for every issue. This newsletter is going to get “stale” without fresh news from all Lightning enthusiasts. TIA.

Having said that, and having just finished writing another issue of the Arion Hangar Talk Newsletter, perhaps the following Latin words are more in order: **nunc est bibendum**.

"Now is the time to drink!"

Blue Skies,

Buz Rich

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