



Arion Hangar Talk

The “Lightning” Newsletter

April 2009 - Volume 2, Issue 4



Ron Ritchie’s– “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 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**.

Contents in this issue:

Page	Page
2 -Lead Stories – Mitchell and Cleavinger	20 - Technical Tips
11 -News from the Factory – LS-1 Update	22 –Reader Feedback
14 -News from the Dealers	23 - Lightning Skunk Works
15 -Current Lightning Dealers	24 - Upcoming Events
16 -News from Builders and Flyers- Words from Earl, Gary, Lynn and Bill	25 – Flight Safety / Other Items
18 –“New”: Engine Clinic –Bing Carb	27 – Final Thoughts

And now, the rest of the news.

The April 2009 issue of the **Lightning Hangar Talk** has a new section called **Engine Clinic**. I hope you find it informative and helpful. Also, once again we have two lead stories. They are kind of a contrast in that one is from Australia in the summer and one from winter in the United States. So enjoy the photos of each country and each season as you read the two lead stories by **Peter Mitchell** and **Dick Cleavinger**. Peter had another article in the January 2009 issue of the **Lightning** newsletter about building his **Lightning**. This article provides some great photos during his “travel adventure” home after completing his airplane. Dick, our unofficial high altitude expert, has also been published before, but this time he adds some “white stuff” in his beautiful photos of his Rocky Mountain “high” adventure.

Lead Stories:

KINGSTON TO BUNBURY BY LIGHTNING

By Peter Mitchell

For eighteen months I had been investigating and then building my new Lightning and here I was at last, aircraft finished and ready to fly home. I was a kid with a new toy.



A mate of mine from Sydney, Chris Bell was going to accompany me on the flight home. I picked him up at Adelaide airport on Monday 3rd November and we drove down to Kingston, some three hours south of Adelaide. We had decided to fly home via Wilpena Pound, Arkaroola, Cooper Pedy, Kings Canyon, Ayers Rock, Kalbarrie and home to Bunbury.

MONDAY dawned with occasional showers, low clouds and a southerly wind, but it promised to improve. We were not in a hurry. We were heading for Rawnsley Park next to Wilpena Pound and in the Lightning that was only 3½ hours flying time. By 11am the weather was improving so we completed our checks, said our goodbyes and took off on our adventure. We tracked over the Coorong, Meningie, Taillem Bend, Farrell Flat and on to Port Augusta. It was good flying, plenty to look at and a tail wind. The landing was tricky with the wind 25knots and gusty from the south. We landed on 15 and taxied to the refueling point to be met by the blokes from Pro Sky Port Augusta who came over to have a chat and admire my new

toy. We tied down and took a cab to town for lunch and to wait for the wind to settle down. We left Port Augusta about 4 pm for the short scenic flight to Rawnsley Park, overflying Hawker and landing on 21 some 40 minutes later. Rawnsley Park is a great Place to stop over; there is very good accommodation, good food, and cold beer all at a reasonable price.

After a good night's sleep, we signed on for a four wheel drive tour of Wilpena National Park. It was a great morning, lots of wildlife and interesting stories and well worth the \$100 cost. We had booked into Arkaroola for Tuesday night and had also booked the "Ridge Top Tour" for Wednesday morning so it was off to Arkaroola after lunch. I throttled back and flew low to admire the spectacular scenery all the way to Arkaroola. We arrived about 3pm after another bumpy ride to land on 21, and were met by Doug Sprigg who kindly provided us with a hangar for the Lightning. Doug is the second generation owner of Arkaroola and is full of interesting information and anecdotes about the area. He is also a highly experienced flyer and flies scenics from Arkaroola in his Cessna 206. We could not have asked for a better host. Doug not only provided a free hangar and transport to and from the strip but lent us with a four wheel drive to explore around the area that afternoon. That night was B-B-Q night, what a feast. It including the best marinated roo steak that I have ever had, and a sing song around the camp fire afterwards.

Wednesday - Next morning it was up early for the legendary **Ridge Top Tour**. This is not to be missed, the scenery is awe inspiring and the geology and history of the area are truly unique. Scientists from all over the world come to study the formations here, some of which are up to four billion years old.



Ridge Top Tour

After a light lunch, Doug took us back to the airstrip and it was off to Cooper Pedy via Maree and William Creek. At the airport we met another pilot Trevor Wright who flies scenics over Lake Eyre from his base at William Creek. His description of the William Creek pub was so intriguing that we decided to drop in and see for ourselves. Chris thought this was a great idea and decided that since I could not drink he would have two. Trevor also told us about a mate of his, Merv at Cooper Pedy, and suggested we give him a ring as he would be sure to show us around the opal mining town.

What a great flight we had, by far the best weather that we'd had so far. The scenery over the ranges was magical and Lake Eyre was so huge. I guessed that it is one of the places that we Aussies have heard about all our lives and strive to see.

We landed at William creek and were met by Allyson, a smashing bikini clad young lady who flies for Trevor. She insisted on escorting us to the pub, which certainly lived up to its billing. I don't know how to describe it; it's old, there are things stuck on the walls, with more stuck on the ceiling. Some young tourists were having a beer at one end while some old station hands were drinking rum at the other. It may not sound like much, but it was very different and if you get a chance to see it, don't pass it up.

We dragged ourselves away and took off on the last leg to Copper Pedy. By the time we landed and tied down, the manager of the Mud Hut Motel had arrived to take us to town. We gave Merv a call and mentioned Trevor's name. Merv said that he was free the next day and would be happy to show us around.

Thursday - Chris and I found Copper Pedy fascinating. Merv not only showed us around town but also took us to a working opal mine and explained its workings. He then took us through his home and a number of other underground buildings.



Oodnadatta

The weather forecast was ominous; thunderstorms, high wind, and rain. That afternoon we could see it building. The owner of the Mud Hut kindly lent us a car to go out to the airstrip to check the lightning and double tie it down. Lucky we did. Shortly after, the storm arrived in spectacular fashion. Strong winds, a huge billowing dust cloud, and finally rain. It was spectacular while it lasted.

Friday - The aftermath of the storm was still with us. Overcast and strong winds, we decided to call off flying today.

Saturday - The weather was definitely improving. After breakfast we fueled up and departed Cooper Pedy tracking for **Oodnadatta**. Oodnadatta is a tiny isolated town in Central Australia and consists of the Pink Roadhouse, General store and Pub. Population is about 10 whites and 300 Aborigines. It used to be an important stop over for the railway many years ago, however the rail now by-passes the town and it is now only visited by a small number of tourists each year. It has a great air strip which was used for training during the 2nd world war. We only went there because so few people do.

Again, the scenery was great. Long ridges and dry river beds criss-crossed the land and those huge dry lakes. We landed and taxied over to a fuel truck where an R44 was being refueled. The helicopter pilot was ferrying it back to Melbourne and he had it full of kit and jerry cans. I sympathized with him as he would be punching into a 20knot southerly. However, he replied that it would not worry him too much as he would stay within 40ft of the ground. Well he was a mustering pilot.

The fuel agent extracted a \$15.00 landing fee, but offered a free ride to town and back, so we thought that was a fair deal. Oodnadatta was another eye opener for us. **The „Pink Road“ House** sure stands out and the old railway buildings from the Ghan days are well looked after and full of historical photos and memorabilia. You can pick up a key to the main building from the Pink Roadhouse and show yourself around. After coffee's we took off and headed N.W. following the Oodnadatta Track back to the Stuart Highway and on to Mt Cavenagh and



Pink Road House



Curtin Springs

then N.W. to Curtin Springs where we landed in time for a late lunch. Again we had an enjoyable flight. The cool temperature, a result of recent storms that had gone through, allowed us to enjoy smooth tail winds. The Lightning was performing beautifully cruising at 125 knots at 2800 rpm on under 20 lph. I just can't wait to see what it will do when the engine is run in.

We were surprised to find in a hanger at **Curtin Springs**, a Hornet STOL with a flat tire and covered in dust. Obviously it had not been flown for some time. We met the owner of the station, Peter Severin and learned that the Hornet was flown by his grandson, but that he had decided to go to the “big smoke” and so the Hornet was “surplus to requirements”. Does anyone want a good Hornet?

We took off on the final leg of 70nm to **Kings River Station** where we planned to stay two nights and



walk Kings Canyon. We phoned ahead and were met by two young blokes Curtin Springs who fly the helicopter scenics over Kings Canyon. They had a good look over the lightning and took us back to the resort. Staying there was good fun. We stayed in tiled floor tents, with proper beds, light and power, all very civilized. A warm cooked breakfast was supplied, and B-B-Q packs and salad could be purchased for dinner. The camp kitchen and B-B-Q area were well equipped, and we met lots of very friendly and interesting people from many countries during our two night stay.

Sunday - Kings Canyon was a great walk, fantastic scenery and challenging enough. Or so we thought, until we met a bloke on crutches who was getting along not much slower than us.

Monday - Up and away early. Our friendly helicopter pilot dropped us at the airstrip at 5.30am. It promised to be a stinker of a day, hot nor-easterly winds and high 30 degree temperatures. We wanted an early start. A thorough check over and we were away. It's a long taxi to the western end of the strip and its all loose sharp gravel. I had completed all pre-take-off checks but had left the flaps up as I did not want to get them stone damaged during the run-up and taxi. Well the inevitable happened. When you change your procedure it can lead to mistakes. I was wondering why the Lightning was reluctant to unstick, of course I had taken off with no flaps. Another lesson learned, I hope.

It is only a short flight to Ayres Rock. I had swatted up on the scenic flight procedures and so had no problem fitting in with two helicopters and a fixed wing as we viewed the Rock in the early morning sunlight. What a great sight. We landed fueled up and were away tracking over Docker River and Giles and on to our next destination, Warburton. We had a good flight, smooth in the early morning but getting somewhat bumpy as we approached Warburton. We flew low, about 1500agl so we could get a close up view of the country. We passed only one vehicle during the whole morning flight.

Circling over **Warburton** we saw that there was a **triple road train** topping up the av gas tank, so we figured there would probably be enough for us. The landing was again challenging, 45 degree cross wind, 25 knots and thermaling. The fuel man said that he had seldom seen a plane tossed about so much on finals. We fuelled up (cash only) and got a lift to the roadhouse for coffee where we met a very friendly crew, “make yourself at home and join us at the kitchen table”. The settlement was a typical outback aboriginal settlement, lots of friendly people, kids, and dogs lounging about amongst the garbage.

We got away at midday in a hot gusty north-easterly wind, which we hoped would give us some assistance. The OAT was 36 degree and thermaling. We kept climbing to find



Warburton Fuel Stop

cooler air and to try to avoid the worst of the thermals, but it was to no avail. At 10,000 ft we were getting tossed about pretty badly. We regularly bashed our heads onto the canopy as we plummeted down, only to be caught in an updraft, one of which had us going up at 2000 fpm with throttle closed and nose steeply down. I had slowed to under 100 knots but it still was a most unpleasant ride. We roughly followed the Great central Road, tracking over Tjukayirla Roadhouse, Cosmo Newberry and on to Leonora arriving mid afternoon, feeling exhausted by the wild ride. We decided to put down and have a break. The wind was strong and gusty and the field was surrounded by dust devils. Chris and I counted 50, and gave up. I set up approach, eyes peeled for dust devils. We had another very rocky final and taxied to the deserted terminal. Opening the canopy and were met by an oven blast. It must have been 40 degrees at least. We collapsed onto the terminal verandah and guzzling water and eating muesli bars. The town and a cool drink were 2km away through the heat haze. The thought of staying in Leonora was not attractive, Kalgoorlie beckoned. An hour later, just as hot and with no likelihood of relief before dark, we decided to press on to Kalgoorlie and a cold beer.

We were into the thermals almost as soon as the wheels left the ground. The heat was terrific. The oil temperature was nudging the red line. Climbing out had to be staged to look after the engine. It was a rough flight but thankfully only 1 hour and soon I was circling around the Super Pit to show Chris. We overflew the field and the wind sock was standing out like a bar and appeared to favor 36. Another challenging final and we were down, centre line, three wheels on the deck about to apply brakes when there was a terrific gust of wind from the right. The wing was picked up and 5453 was literally flung off the runway to the left. Instinctively full throttle and stick back, we staggered into the air. Cleared the runway lights by inches and were over the drain at the side of the runway. I glanced at the airspeed and got a shock, 36kn but thankfully we gathered speed quickly and climbed away safely. It was a nasty moment. Even super-calm Chris was a little rattled and asked, "Do we have to land". I checked the wind sock and it was now favoring 29, the dammed thing was out like an iron bar and varying 90 degrees every few seconds. I decide to land on 29, at least it was twice as wide as 36. This time we got down with no drama. Relief. Tied down, called a taxi, air-conditioned motel room, showered and down to the pub for a cold beer. Heaven. It had been quite a day. 7.4 hours 770 n.m, two fuel stops and the roughest flying and most challenging landings I have had to date. I decided that I will never fly in central or northern Australia in those temperatures again. It was not fun.

Chris has not been to Kalgoorlie before. I love the place. You can spend a week here easily. There is a lot to see and do. The pubs are really interesting and reflect the huge money that was around at the time of Federation when Kal. was at its height. Public buildings are just wonderful and the main street was designed wide enough to turn a bullock team around.

Tuesday - Home beckons and the day is cooler. A trough is across our track but it will not worry us too much. I phone Bunbury Flying School to get the weather at home. It is overcast 8 Oct at 3000ft over the scarp, so we'll have to stay low but otherwise it's okay. We take off and the flying is pretty smooth at 4500ft and its always interesting country west of Kal. We touch down at Narembeen and give a quick call to Bunbury to check conditions, no change. We're off again on the last leg home. Within 15 minutes the holes are getting smaller and fewer so we drop down to 2500ft. under the cloud, that's approximately 1000agl. It's bumpy, but nothing after yesterday. I am ready for home at this stage and when we fly across the scarp and Bunbury comes into view it is a great feeling. We land and taxi up to the Flying Club to be met by my mates and by loving and understanding wife, Jenny. It is great to have a trip away but it's even better to arrive home. I have a great feeling of achievement, having bought a new plane to completion, flown all the test flights and having competed the trip across Australia.

A few facts and figures;

In nine days we flew 2230nm in 20.5 hours flying time and used 380 Liters of av. gas.

Navigation: I carried all necessary charts, an Asus Eee pc and Telstra next G wireless which in total weigh less than 1kg and will connect to the internet anywhere that Telstra next G works. This gave us all the latest weather and connection to air services for SARTIME. Flight planning was done each day and we also ground navigated following major rounds for most of the route. We had the Garmin 296 GPS and transponder. I carried a 406 emergency beacon, 5 liters of water, emergency food, tiny tool kit, aluminum pegs and ropes, small tomahawk (for bashing in pegs and getting out in case of a rollover) and minimal personal effects.



We had intended to fly home earlier in the year when the weather would have been better; however it didn't work out that way, for a variety of reasons. The flying was certainly challenging at times and landings seemed to be mostly cross wind, however both Chris and I had a great time and the Lightning performed superbly.

Cheers, **Peter Mitchell**

Next: Winter in the Colorado Rockies, by Dick Cleavinger.
Take a look at these impressive high altitude photos.

I know this short article is somewhat repetitive of my last input, but it is winter time and the pictures show a lot of snow.

Boulder is at the eastern foot of the Rocky Mountains. The red tile roofs seen in the picture are the buildings of the University of Colorado. The rock formation in the background is called the Flat Irons and forms the transition between the flat land to the east and the mountains. In the second Boulder picture the snow covered "back range" is the continental divide. The pass that I fly over going west is at the very left of the picture. The highest peak at the right is 14.2k ft Long's peak close to southern edge of Rocky Mountain National Park.



Boulder, CO. Dick's home base.



Golden, Colorado

Boulder, KBDU, is my home base at an elevation of 5300 ft. The winter overnight lows are typically 15 to 20 deg. I have a Tannis engine pre-heater that is hooked to a timer. If I think I might fly I make sure it's plugged in the night before. It comes on a 0400 and when I'm ready to fly at 7 or 8 it's ready to go. If it's really going to be cold I put a blanket over the cowl the night before.

Golden Colorado was the state capital for a time in the 1800's. It is now home of the Coor's brewery, the large white building in the lower left of the picture. Golden is also the home of the Colorado School of Mines, a renowned college of mining engineering.

The continental divide, at 11.5k ft is only about 18 miles west of Boulder. The climb in the Lightning is easy unless there are winds from the west rolling over the ridge. If that's the case I climb to 13.5k or so while still 5 miles or so east of the ridge to avoid the down flow. If the 12k elevation winds are predicted to be 20mph or more they can be a good bit higher than that on the ridge, in which case I don't try to fly.



Continental divide in the background.



Grandby is headwaters for the Colorado River.

A flying buddy of mine lives in Grandby Colorado. He is building an RV 6A but won't have it done till later this year. Most of my mountain trips these days consist of flying over to Grandby, picking up Gene, then flying somewhere for breakfast. We have been to Leadville, Steamboat Springs, Walden, Telluride, Glenwood Springs, and Eagle. Grandby Reservoir and Grand Lake collect Colorado River water from its headwaters in Rocky Mountain National Park. There is a tunnel through the mountain that delivers some of that water to the cities on the eastern slope.

Dillon Reservoir is also a source of water for the Denver area. As at Grandby there is a tunnel from Dillon supplying water to the eastern slope. Vail ski patrol and service people commonly live in towns such as Frisco and Leadville and commute to the Vail village and ski area. Not many working folk can afford live in Vail, only presidents and such. (Jerry Ford lived in Vail village for a long time)



Dillon



Vail Village, Ski Area, and I-70

Leadville, many peaks across valley are at 14,000. That's pretty darn high.





Crossing 16 for left downwind to 34 at LXV



Leadville, LXV, elevation 9927, highest in US.



11.5K at Corona Pass, Gore range in background.



During the return landing at Grandby, my left tire failed. Gene sold me the tires he had waiting for his RV. We had a new tire on in a couple of hours and I got home in good shape. The next day I mounted the other new one on the right side and I find the shimmy problem is better with the heavier 6 ply tires.

Dick Cleavinger
N213RC - Lightning #42

News from the Factory:

SLSA “Lightning Sport” Update:

17 March, 2009: Nick reported that he had completed all of the control system testing for the LS-1. All control system bell cranks, mount points, and stops were tested along with the stick and pushrods. The hinge lines were also individually tested to loads of 1.5 times the ultimate load expected.

The picture is of the elevator hinge line test. A bracket is made which is clamped to the trailing edge at the center of the control surface. In this case it is pulled up to the control stop and then force is applied past that to load the hinges to the correct torque value.

All systems passed well beyond that required.



24 March, 2009: The photo below shows the LS-1 as it looked when I arrived in Shelbyville to help with final assembly and ASTM flight testing. In addition to the normal build crew led by **Nick, Mark** and **Moostang Mike**, other helpful build assistance was provided by test pilot **Katie** and the newest Lightning dealer, **Dave Jalanti**.



Below is the panel for the LS-1 and a photo showing the backside's intricate but neat wiring setup.



28 March 2009: As I have mentioned before, the overall goal for the LS-1 project is to have it's ASTM certification completed in time for Sun N Fun. To achieve that goal, the Lightning team is working overtime on both construction of N325AL and on the volumes of paperwork for the FAA inspector. Of course while all this is going on, the numerous flight test profiles continue. Some flights require special instrumentation such as shown below with the stick force measuring gauge. The installation with hose clamps may look primitive, but the accuracy of this instrument is amazing. Since the gauge must be rotated during flight so that it can measure pitch forces forward and aft, and roll forces left and right, you have to mount it on the stick for the seat you are **not** flying from. (The gauge is too big to allow the stick to go full throw if it were mounted to the stick in front of you.) This odd situation requires you to sit in one seat and fly with the stick in front of the other seat. Yes, test piloting is sometimes fun and sometimes "different". This is one of the "different" parts.



Be sure to see the newest ASTM certified Special Light Sport Lightning, the LS-1, at Sun N Fun. Many people will think it is a brand new airplane, but the SLSA Lightning has over 3 years of developmental experience and operational flying behind it in the form of about 80 kits sold and 50 % of them flying. All of these flying EAB Lightnings, with their many hours of flight time, have played a major part in making this one of the most proven and best flying light sport aircraft on the market. And at a starting price of only \$93,900 for a brand new "turn key" airplane with fantastic sporty feel and "million dollar" looks, I predict a great future and a high demand for this amazing "jet". Besides, it looks like it is going Mach 2 just sitting on the ramp.

Lightning Sales and Build Update:

Mark reports that the current number of Lightning kits sold and those flying are not much different than last month. In February, three kits went to Green Landings; kits 81, 82 & 83. These kits were for **Richard Cudney, Greg Crouchley** and **Ryan's** new demo for Green Landings. So all total to date 77 kits have been delivered. (Remember 6 serial numbers were either not used (2), destroyed (1) or not delivered (3 initial heavy fuselages). **Mark** further reported that the last count he had was 38 flying as of 30 Dec '08. Several more should fly late this month or early April. (See note from Australia below.)

While I was at Shelbyville in March helping **Nick** with the test flying duties for the LS-1, **Pat and Carl Beatrice** were also there for the second portion of their build process. The photos below are of the beautiful white, green and gold jet that they are building at SYI. The airplane, the instrument panel, and all sub systems are outstanding examples of workmanship and the thought, planning and research that go into deciding just how you want your custom airplane to be. To my way of thinking, that is what makes building experimental amateur built airplanes so popular and rewarding. Have it your way.



On Friday, 27 March, everyone stopped work to celebrate **Moostang Mike**'s birthday (that is him above helping **Carl** and **Pat** hang their engine and him below wearing that "shaker hood" hat). I don't know just how old he is, but there is a rumor going around that he and Edsel Ford went in kindergarten together and **Mike** was in the more senior class. Of course, Ford later named one of their cars after **Mike**; the Moostang.



Mark, Nick, Moostang, Pat, Pete, and Carl.



Mike with big SEG.

News from the Dealers:

From Lightning Northeast: (Dave Jalanti – the newest Lightning dealer.)

Hello Buz,

Thanks so much for updating the dealer list with my information. This is my update for now with some pictures attached. Feel free to use any of this and the pictures for the next newsletter.

As you know, plans often change. My original plan, to have my Lightning kit shipped to NY1 (Kline Kill Airport in Ghent, NY) and for me to go to SYI to help with the Pat and Carl Beatrice build, did in fact, take a slight turn. I arrived at SYI the afternoon of Feb 10th. Literally the minute I walked into the Arion hangar Nick put me to work. He didn't even give me a chance to change out of my travel duds and into my work grubs! The new SLSA Lightning wasn't quite ready to go to paint so that was the first order of business. They were bonding the canopy skins so that is about where I jumped in to cut my teeth. With a few details left before LS-1 was ready for paint, Moostang Mike and I took the wings to Chad. So I got to meet Chad and discuss how I wanted to paint my plane and he kindly loaned me some color chip books. We then went over to B&B Auto Trim where I got to meet Steve and discuss interiors with him.



Pat and Carl Beatrice arrived Feb 16th and we all went to work on their "Jet". Pat and Carl have been great to work with and of course working with Mark and Moostang Mike, I have been getting a brain full of Lightning mush. I hope all this information congeals into something solid before I start doing my own builder assists at NY1! Assembly work, grinding gel coat, fiberglass layups and sweeping the floor were rapidly becoming a normal day for me. Only now can I really appreciate the effort that Nick, Mark and Mike have put in to this program. Knowing the tricks of the trade, having the correct tools for the job and being organized are all key. Of course having Mark there to tell us to "get back on our heads" when returning from lunch helps too. Easy for him to do, he has a freshly cut "flat top"!



During the week and a half that Pat and Carl were there, I was able to spend a few hours here and there getting acquainted with my Lightning, N81DJ. Once their plane was ready for paint, I had a few days left to focus more on N81DJ. With Moostang Mike's help, the new Engine mount and cowl has been fitted and the tail mods were in process. By the time I had to leave, there was a relatively short list of items remaining before paint. The base color will be a slightly off white (same as LS1) with a lower fuselage color of "Radiant Ruby Pearl" (a Burgundy metallic) and an accent stripe of "Mojave Mist" (a bronzy gold). The interior will be two tone beige with Burgundy trim and Lightning logos similar to the current demo plane.

While there, I had an opportunity to get a start on some transition training with Katie. We were airborne for less than a half hour when Katie noticed the oil pressure reading fluctuating. While the indicated

pressures were well above any low limit, Katie being the cautions pilot she is, decided we should return to have it checked out. Nick figures it's just the oil pressure sending unit getting ready to crap out. Better to be safe than sorry! At any rate, the flight, although short, went well and I don't think I will have much difficulty transitioning. It's difficult to evaluate any plane during a flight that brief but I can tell the Lightning is every bit of the rave I hear from those with hours in them.

I'm returning to SYI March 24th to continue working with Pat and Carl and to do anything else I can to learn and help out with LS1. I hope to have my plane back from paint and some more of the final build done before leaving on April 9th or 10th. Buz, thanks for all you do for this group of Lightning lovers! Maybe I'll see you at SYI this time around.

Dave Jalanti
Jabiru Power Solutions, LLC

From Lightning Australia:

Hi Buz, I thought I would let you know our new Australian Demo Lightning had its **first flight on 23rd of March** and all went well. I will send you some photos as soon as I can. *Note: Photos will be in next issue.*

Regards, **Dennis**
Dennis & Angela Borchardt
Lightning Aircraft Australia



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, WV, 304-754-6010, 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:

Remember our very own World Record Holder, **Earl Ferguson**, recently underwent a “fuselage modification” to his personal body in the form of a hip replacement. Earl is doing great and plans to be at Sun „NFun later this month. Earl sent the following update on his ongoing phase one hip test program.

Buz,

I didn't take a camera into the operating room or the hospital, but thought a pix of my home physical therapist might be of interest. This is Kate, and she did wonders. I'm now driving and back at work. Haven't been flying yet, but will spend some time at the hanger this W/E trying everything out.

Latest Newsletter edition is great; Linda's comments are right on. We really appreciate you work on the newsletter.

Earl

NOTE: Earl, you owe her a flight in your World Record jet.



Next is another of **Gary Pennington**'s flights around the very scenic state of Arizona. Once again he flies back to Lake Havasu. That was always one of my favorite airports to fly to while I was stationed in Arizona and California.

Wow! Avgas in Lake Havasu is now \$2.75 per gallon! What a deal.

Yes, it was another great day in Southern Arizona. And, another great flight to Havasu....except for the 29 mph headwind from Buckeye to Havasu. When approaching the Harcuvar Mountains, I descended from 7500' to 6500' in an attempt to find better conditions and was blessed with a 19 mph headwind. Of course, there is a bright side; on the return trip I enjoyed a 32 mph tailwind at 8500'.

By the way, I now have 100.3 hours on my bird.

I've attached three photos. The first photo is the Nuclear Power Plant Northwest of Buckeye. The second is Parker Dam at the southern end of Lake Havasu and the third is Lake Havasu looking South after takeoff on runway 32 and turning left crosswind.





Havasu is a nice community with all the modern conveniences where approximately 50,000 people live. Each time I visit, I enjoy it more. I hope you like the pics. Have a great day.

Gary Pennington - pennington@q.com

Next is Lynn Nelsen's latest suggestion and input for the newsletter.

Hey Buz:

Another great job on the newsletter! I have made a minor modification to my panel which may or may not be worthy of note.

I had noticed several of the anodized screws that hold the panel in place had begun to rust. I suspect the salt from my sweat (blood) or whoever put the screws in place that hot day in July. Nick had promised me new ones, but I got busy and forgot to get them. So I was looking around at Lowe's and discovered that they have these black vinyl screw covers for the heads of screws. I purchased enough to cover all the panel screws and put them on. They are somewhat bigger than the screw head, but after putting them on, they seem to look OK to me. The best part is that they have covered up all the screws that were showing rust. It took me about 45 minutes total time to remove each screw and replace it with the cover installed. While I was at it, I changed the glove box cover too, so it looks more centered. I will attach another picture which is prior to the changes (It really does not look that much different)

See picture on right.

Lynn



Bill Browns sent in the following suggestion about 50 and 100 hour engine checklist that are available on the Jabiru web site.

Buz, You may have already know about these but in looking up the service bulletins on the Jabiru USA web site for moving the engine ground to a starter bolt I noticed they have 50 hr and 100 hr inspection checklists listed. I took a quick look through them and thought they looked pretty good. You might want to reference them in the newsletter.

Bill Browns

Johnny Thompson, another member of the Arizona Lightning gang, sent the following update on his jet and some great photos. Have a look.

Hi Buz

Thought I would send the first few pictures of the modification/rebuild and repaint of 8WN.

I wish you had not put that old picture of 8WN in the last newsletter. When you said it was painted like a California Hot Rod I knew it had to change. I went out in the Arizona desert and took a picture of a recluse flame dragon (lasflamousdemonus) and painted it on my cowl.

I did quite a few more modifications (none which are needed, just fun to do) which I will share at a later date.

Enjoy Sun & Fun. Share the pictures with Nick and others. I am sure people will love it or hate it. No middle of the road on this paint job.

Johnny



Engine Clinic: (New Section)

This month we are starting a new section to the newsletter: **The Engine Clinic**. Hopefully we will get sufficient inputs for this section to become a permanent part of the newsletter. The initial article for the Engine Clinic comes from “Mr. Jabiru USA” himself, Pete Krotje. In this issue Pete explains the Bing altitude compensating carburetor, a topic of recent discussion on the Lightning email list.

Bing Altitude Compensating Carburetor

The Bing carb is one of the more mysterious parts of the Jabiru engine used in Lightning aircraft. Getting it to properly provide an appropriate mixture is relatively simple in concept but somewhat complex in practice. Over the next few newsletters I’ll try to unlock some of the secrets of the Bing carb and how to tune it for maximum performance.

The Bing relies on a tapered needle that rides up and down in a needle jet to vary the rate of fuel delivery to the engine. The needle is attached to a rubber diaphragm in the carb dome. Several different factors affect the position of the diaphragm and hence the position of the tapered needle.

Let's examine the five factors:

1. The ambient pressure of the incoming air. If you look straight in at the intake throat of the carb you will see two vents cast into the body of the carb at the 10 o'clock and 2 o'clock position. These vents feed air to the bottom side of the diaphragm and put an upward force on the diaphragm.



2. The main spring is found inside the top of the carb dome and it exerts a downward pressure on the diaphragm, trying to push the diaphragm and needle down into the needle jet.



3. Engine vacuum (manifold pressure) is fed to the top side of the diaphragm through two vent holes in the engine side bottom of the carb piston. This vacuum is shielded from the engine intake by the throttle butterfly.

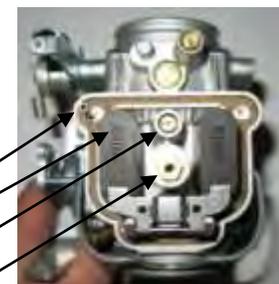


4. Mechanical up force from the air rushing into the carb throat. Notice that the intake side of the carb slide (piston) is angled and as air flows into the throat it tends to put an upward force on the carb slide – counteracting the downward force of the main spring.



5. Pressure in the fuel bowl. Higher pressure in the bowl will force fuel through the jets at a faster rate and lower pressure in the bowl will reduce the flow rate through the jets.

Choke pick up
Float
Idle jet
Main jet



All of these factors have to work together to produce a fuel flow rate that will provide the correct mixture throughout the rpm range of the engine. Next month I'll examine how each factor contributes to and affects the fuel flow.

Pete Krotje



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Technical Tips:

This month's technical tips section covers two subjects that have been mentioned before – **engine idle/stopping on final and gear leg shimmy**. But since builders and readers continue to experience these issues, I thought it would be appropriate to include some of the latest message traffic on these two subjects.

First, on the subject of engine idle and stopping on final, please take a look at the Tech Tips section of the January 2009 issue of the Lightning newsletter. It was covered somewhat in that issue, so you may glean some information by reading that. Next, both Clive James, our UK newsletter correspondent, and Pete Krotje, the esteemed Grand Poobah of all things Jabiru, add some insight into the cause and fix of this problem.

The problem is caused by the fact the throttle stop isn't strong enough to prevent it being flexed by operating the throttle from the pilot's control. **(Editor's note: Remember we add a throttle arm extension on the carb so that you have more throttle movement in the cockpit. This throttle arm extension gives your "throttle pull" more force as Clive mentioned.)** As explained by others an additional stop on the cable is recommended. The simplest and cheapest way of fitting this is to use an electrical screw connector. These connectors are readily available and known in the UK as 'chocolate block'. See attached pictures.



The pain when fitting is the fact the end of the cable needs removing from the cable to fit it. This additional stop prevents the cable from being pulled too far and bending the throttle stop arm which holds the adjustment screw (at a strange angle). The throttle stop arm is one of those Jabiru issues that is not really applicable to a Jabiru plane throttle so hasn't been 'improved' by the manufacturer.

During the early hours your Jabiru engine will loosen up and the idle will increase, you will have to make a few adjustments in the first 100 hrs. There is also the issue of the idle mixture which if not set correctly will make the idle running sensitive and liable to stop at higher revs than you would like. An 850 rpm idle on finals will give 1000 rpm or more, revs that will make many aircraft float along the runway nicely (tell me about it....).

Regards, **Clive**

Now, Pete Krotje's comments on the throttle stop.

I know we've covered this topic before but without a throttle stop to prevent excessive force at the carb throttle arm a strong pull on the throttle will actually bend the throttle adjustment screw on the carb. There is a metal tab attached to the carb that holds the idle rpm adjustment screw. This is a stamped piece of steel but there is more than enough force that can be applied, especially with our throttle arm extension, to bend this stamped piece.

A throttle stop applied as **Nick** detailed in previous emails will prevent excess force from bending this metal piece. If you do not have a throttle stop installed then you should do so soon to prevent bending the idle adjustment tab or bending the cable attach bracket on the carb.

Pete

Next is some additional information on gear leg shimmy with inputs from Dick Cleavinger, Wayne Lenox and Gary Pennington.

In February of '08 **Linda Mathias** and Buz Rich talked about shimming the axle on Linda's Lightning. The conclusion at that time was that adding the shim did not measurably improve the gear leg shimmy in her plane.

I have been chasing the same problem in my Lightning. Last November I had a wheel off for balancing and noticed the clearance between the axle and the gear leg weldment that Linda had referred to. I measured the wheel motion that this clearance allows at 0.10 inch. Over the three inch contact of the axle and weldment, that play represents about 2 degrees of potential wheel motion. It would appear that any wheel alignment performed without shimming or welding the axle may not be worth much.

My gear legs were set to 1 deg toe in at SYI in during the build in September of '07 and 1 deg toe out in June of '08. I have shimmed my axles (yes, I used a beer can for shim stock) and checked the alignment of the main gear legs. The right leg was true within about a tenth of a degree. The left leg had about 1 1/2 deg toe out.

I have learned from three sources that the RV main gear alignment spec is true, no toe in or out. (at least for the RV 6 and RV9 that I have data for). Since the Lightning suspension is so similar to the RV design, I thought it reasonable to try the RV alignment spec.

I have realigned my left gear leg to true (within 1/4 deg) and my shimmy problem has gone away. Hooray!!! I still have shimmy during braking and I will be working on getting rid of brake disk run out.

I now have Aero Classic tires. These are 6 ply tires that are sold by Van's for use on RV aircraft. I came by these because of a flat tire during landing at Grandby returning from Leadville. My passenger sold me the ones he had purchased for his RV 6A which he hopes to finish this year. I have been inflating these to 26 psi. A trial run at 30 psi produced a mild shimmy, so back to 26 psi. (I may try 28 psi later.) I had the wheels balanced with these tires and no correction weights were required. I was impressed.

I measured alignment by dropping a plum bob from the prop center and from the vertical stab center. I used a 6 inch offset from the front and rear plumb points to avoid the front gear (I don't remember how Mark gets around the front gear with his chalk line scheme). I project a laser from the rear reference through the front reference and onto the hanger wall which is 19 feet from the center of the main gear. I measure from the brake disk to the 6 inch offset reference laser line. A laser parallel to the brake disk projects onto the hanger wall. If the alignment is true, the brake disk laser beam on the wall agrees with the distance measured under the airplane (accounting for the offset of the laser source from the brake disk).

My next project will be wheel pant balancing. Photos below.

Dick Cleavinger, Lightning #42 - N213RC@gmail.com



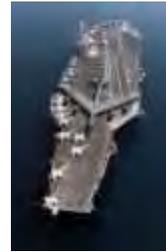
Dick will have an article in next month's newsletter describing his "ballancing" act.

Wayne and Gary added that they are both using 6 ply "Monster Retreads". **Gary** keeps his main tires aired up to 26 psi and **Wayne** is using 30.

Reader Feedback:

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

Remember the photo on the right? Last issue I asked for readers to send in a caption for the photo above and the best one would be published in this issue. Only four readers sent in captions, so I will include them below and you can decide which you like the best.



First, from **David Smith** of Cupertino, CA: "The Navy's new vertical take-off B-52 takes up service on carriers as we ramp up on Afghanistan, keeping the carpet bombers close at hand."

And then, **Kent Misegades** from Cary, NC suggested:

"President Obama Extends Alternative Energy Initiative to the Navy - Making good on his election campaign promise to support the development of alternative, green forms of energy, President Obama has ordered the US Navy to convert its current fleet of aircraft carriers from nuclear power to biofuels. Seen here in its first trial run, the USS Nimitz (CVN-68) has removed its twin Westinghouse A4W nuclear reactors and replaced them with a 1962 B-52 bomber from the Davis-Monthan storage facility near Tucson, AZ. The cold-war vintage bomber has been chained to the flight deck so that it will not itself be launched when powering the carrier with its eight J-57 jet engines. Captain Michael C. Manzair, Commanding Officer of the Nimitz, comments: "Not only are we recycling an airplane that has been parked in the Arizona desert for nearly three decades, but since the B-52 burns a biofuel derived from sea algae that's distilled in the ship's former engine room, we are making a tremendous contribution to the flight against global warming. A side benefit is the ability to distill the 23 tons of potato peels we produce weekly into 2,300 gallons of vodka, which has contributed greatly to the esprit de corps of our crew. We have yet to resolve the problem that the B-52 pretty much blocks all air operations for our fixed-wing aircraft; however we're working on that. After all, it is our intent to save the polar bears that really matters, isn't it?" For his enthusiasm in this vital effort, President Obama recently presented Commander Manzair with the new "Order of the Polar Bear" medal.

Cliff Crampton suggested, "Pretty good STOL performance on this little sucker."

And finally, **Mike Allen** sent in the last suggestion. "YEA, SOME GUYS JUST HAVE TO OWN THE BIGGEST TOYS"



Lightning Skunk Works:

As you might expect, **Nick** and the Arion team get lots of suggestions for the Lightning. These suggestions range from such things as changes to the basic design, things to add as options, and even things that would add another flight capability for the airplane's operation. Being a very proactive group, they evaluate all of the suggestions for the various pros and cons, and even do preliminary testing on some of the suggestions to determine if any should be incorporated. Occasionally, someone's suggestion is determined to have great merit and that suggestion is then incorporated into the basis Lightning design, or into Arion's overall business plan. A little over a year ago, someone asked if it would be possible to put floats on the Lightning. Obviously that is a very intriguing idea, but one that would require a great amount of time and effort. First you must design the floats and subsystems, then produce a prototype set of floats, and finally to flight test them: Too much time for the ever busy Lightning Skunk Works team to take on.

But sometimes potentially good suggestions have a way of getting done even if the “factory” guys are too busy to get directly involved. So, not to let a good idea go to waste, the Virginia detachment of the Lightning Skunk Works team has been hard at work in a secret hangar at Wakefield airport (KAKQ), with the goal of producing a prototype set of floats for the Lightning. Primary credit for the design and fabrication work of the first set of floats goes to **Joe Mathias**. **Joe** is an absolute master craftsman in all types of aircraft construction and has built and restored several Oshkosh champion aircraft in the past. Of course, **Joe** was ably assisted in this monumental task by his bride of many years, **Linda Mathias** who built Lightning kit #20, N59JL. The prototype set of floats for the Lightning are constructed of marine and aircraft quality plywood, but once the design has been flight tested, they will be used to produce a mold so that follow on floats can be quickly duplicated out of fiberglass. The photos below (photos by Russell Hornsby) show the floats mounted on the test aircraft, N31BZ, Buz’s highly modified Esqual LS (Lightning Stuff). Heck, I might change the LS to LSS to mean Lightning Stuff Seaplane.



These photos were made on the initial roll out day, but since that time, water rudders have been added to the floats and are tied directly into the aircraft’s rudder cables. We have also built a dolly that will allow the airplane to takeoff from a “land base”. The dolly also makes it easy to move the airplane around the hangar. Initial water landing and taxi testing is planned for a secluded cove in the nearby James River. Current schedule calls for that initial water landing to be on **April 1**.



Upcoming Events:

21 to 26 April - Sun-N-Fun at Lakeland, FL. Arion Lightning will be in Booth LD005, but the LS-1 Lightning will be on display in the Light Sport Mall. Several forums should be of interest. The Jabiru engine forum presented by **Pete** will be on Wednesday at 1200 in Forum tent 6. **Nick’s** Lightning forum

is on **TO BE DETERMINED** at **TBD** in forum tent **TBD**. And finally, the Lightning enthusiasts“ get together will be on Friday, with everyone meeting at the Arion booth at noon.

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

30 to 31 May - Virginia Regional Festival of Flight. Suffolk Airport.

27 July to 2 August - Oshkosh AIRVENTURE. Many convention facility changes will be evident this summer at Oshkosh. The main entrance gate will be further west and new “walkways” will fan out from there taking you to many new display areas. One major change for us Lightning enthusiasts is where the Lightning and Jabiru booths will be located. When you come in through the main gate walk straight east towards Aeroshell Square, but then take the third aisle or walkway to the right. Then the 4th through the 6th display areas on the right (numbers 134, 135, and 136) will be where the Lightning and Jabiru are located. This area should be easier to find and hopefully will result in more “walk up” traffic.

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

Flight Safety:

The flight safety article for this issue is actually two articles below in the **Other Items** and **Final Thoughts** sections below. One article is on crosswind landings and one on grass runway operations. Although both articles have some mention of the Lightning and some specific techniques that I use, both articles would probably be helpful to any type of aircraft. You be the judge.

Other Items:

Growing up in the south there seemed to be lots of folklore old sayings that the “adults” of the time would often repeat without ever explaining the how or why. One old saying that I remember was that the month of March “comes in like a lion and goes out like a lamb”. So to me as an aviation minded youth, the month of March, at least the first windy part, was always a good time to “go fly a kite”. The heavy winds made it easy to get my latest homemade kite airborne and way up high. That was fun. But now, as an aviation minded senior adult, those same lion winds in March often make for some interesting crosswind landings. So since this is March, I thought a quick review of crosswind landing techniques might be in order. Here goes:

Keeping the airplane on the runway during takeoffs and landings during crosswind conditions can be a challenging situation for many pilots. Just read some mishap reports or watch and listen while there is a heavy crosswind at your local airport. You are likely to see some interesting short finals and touchdowns and maybe even hear some screeching tires. Basically runway directional control is a function of controlling the effects of these things:

1. Wind
2. Runway surface (grass is often more forgiving than a hard surface) – see next article.

3. The aircraft itself (tail/rudder design, tailwheel, and **wing loading**. I typed **wing loading** in bold face because this is one area that any aircraft that is designed with a “light wing loading” like the Lightning may require extra caution and techniques in a crosswind situation.)
4. Any aircraft malfunctions such as brakes, tires, etc.

Mention directional control on landing and pilots will naturally think about the effects of crosswinds (here is that lion of March). Most airplanes have a maximum demonstrated crosswind component listed in the POH. This number is not a specific measurement of the maximum control authority the airplane has against crosswinds, rather it is the maximum that was *demonstrated* to be controllable during the aircraft’s certification process. For most airplanes this “max crosswind” capability seems to be in the 12-17 knot range. For experimental Lightnings, you determined that number during your Phase 1 test program. I know that the demonstrated crosswind component for the prototype and demo Lightnings is listed at 15 knots.

However, most incidents of loss of runway directional control seem to occur at much less than the airplane’s maximum demonstrated crosswind component. Why? To my way of thinking, the pilot’s capability is the determining factor of how much crosswind can be safely handled. Therefore, a pilot’s training, proficiency, and currency are the primary considerations – not the airplane’s design and not the demonstrated crosswind component listed in the POH.

There are two schools of thought on how to compensate for crosswinds when on final approach. The two common techniques are:

- The crab method: This technique involves maintaining wings-level on final approach while holding a heading that compensates exactly for wind drift. The advantage of this technique is that it reduces chance of dragging a wingtip on touchdown. The disadvantage is that it requires constant re-evaluation and changes to the crab heading as the wind direction and speed changes with altitude as you fly down final approach. And during the actual landing, it requires that the pilot expertly time a “kick out” during the landing flare to touch down with the airplane’s longitudinal axis aligned with the runway centerline. This technique also does not provide positive indication as to whether or not the pilot or aircraft has the control authority or skill to compensate for the crosswinds until at the last second when it is time for the kick-out maneuver when at a very low altitude.
- The wing-low method: This technique calls for maintaining a forward slip with the upwind wing held low into the wind, with opposite rudder as needed to maintain runway alignment. The advantage of this technique is that it allows the aircraft to maintain runway alignment from well out on final approach through and including the flare. If the pilot is unable to hold alignment at any point on final, (for example if the crosswind changes) he knows to abort the landing attempt from higher in the air. The minor disadvantage of this technique is that it slightly increases stall speed on approach as a result of the uncoordinated flight while in the slip. Another disadvantage for a low wing aircraft like the Lightning is that in really high crosswinds, the low wing may get pretty close to the runway itself. In that situation, you probably want to try another runway or go to another airport. Hint, hint.

You should stay proficient with crosswinds by purposely seeking out progressively greater crosswind conditions. When the winds are nearly aligned with your home runway, fly to a nearby field with a slightly greater crosswind component, and practice some landings there. Remember you can always go around and fly somewhere else, perhaps back to your home base, if the crosswind is too high.

After a couple of landings and takeoffs there, fly to another airport with even more crosswind. As much as possible, continue your landing practice with greater crosswinds until you begin to feel uncomfortable with the approach and go around. Compute the crosswind component at the last airport where you landed comfortably and then take two to three knots off that crosswind and consider this number to be your current maximum (you only flew comfortably at the higher crosswind after considerable recent practice with crosswinds building up to that point). I also suggest you reduce your “personal maximum” by two knots for every month you go without landing with a significant crosswind. Also remember that

you should frequently practice landings with less than the normal flap landing condition. Less flaps will raise your stall speed, but may allow you to handle a higher crosswind than your normal flap landing position. So instead of the normal 30 degree flap landings for Lightnings, you should also practice with 20 degrees, 10 degrees, or even no flap approaches and landings. You want to keep your “bag of tricks”, fully stocked.

Now for some specific thoughts on landing the Lightning in a strong or gusty cross wind. I mentioned above that wing loading was one factor to consider and that the Lightning has a relatively light wing loading. You probably know that the Lightning has a wing loading of about 13.2 lbs/sq. ft., but how does that compare to other airplanes you may have flown? Well, the Cessna 172 is about 14.1, so it would feel more steady because each foot of its wing is carrying more weight. So any gust would tend to upset it a little less. But what about an aircraft’s maneuverability? The Lightning is certainly quicker to respond to control inputs so in a Lightning you can “fix” a problem much quicker when the wind causes one. Just don’t over correct or over control. I remember when I first started flying gliders how I would over correct. Up to that point all my flying time was in fighters, so the gliders and sailplanes seemed extremely slow to react to control inputs to me. I would see the need for a correction and I would have put in about three control inputs before the first one even became effective. I had to “recalibrate my hand” to the slower reacting aircraft. You may have the opposite situation when transitioning to the Lightning or encountering gusty crosswinds for the first time or two. The key is flying the Lightning often enough to stay current and to “recalibrate your hand” to the more responsive airplane. Once you get used to flying a Lightning, a Cessna or Piper will feel like dump trucks after driving a sports car.

I mentioned above that you should practice crosswind landings with less than normal landing flaps. That raises your stall speed some and gives you a little more margin if the gusts are really strong. And since the Lightning’s stall speed is relatively low, the gusts can also cause you to float or even gain some altitude when you are in the flare at 6 inches and had the perfect landing set up. One other technique I sometimes use when flying the Esqual or Lightning when landing in crosswind and/or gusty conditions is when in the flare just above the runway, I start “bleeding” off or slowly raising the flaps so that when the touchdown comes, any additional gusts should not cause me to get airborne again. The key is practice, currency, and “calibrating” that golden hand that you fly with.

Now that you have read the above, what is your current personal crosswind component? That is the number that I think is much more important than the aircraft’s demonstrated crosswind component. Your thoughts and feedback are always welcome.

Note: As an afterthought, I invite any of you to come to Virginia and fly my 1940 J3 Cub Sport with me. That “kite” has a wing loading of only 6.84 lbs/sq. ft. and believe me, the controls are pretty sluggish, especially when compared to a Lightning. But when flown regularly and properly I can land in 15 knots of crosswind. It may not be one of my best landings, and it may teach me some humility, but it is a fun old bird to fly and I think you will enjoy the experience. Heck, we might even get Joe Mathias to pull out his Cub and we can do some formation training. Now that is fun.

Final Thoughts:

Let me start this issue’s **Final Thoughts** section by saying loud and clear, **I love grass runways**. To me, no landing feels quite as nice as a late summer evening touchdown on a nice smooth grass runway. The sound and feel of the tires as they first start just kissing the grass, the relatively quick deceleration, the forgiveness of any slight drift at touchdown, everything about landing on a smooth grass runway is a pleasure. Yep, the sight, the sounds, and even the smells of a freshly mown grass runway are fantastic.

However, there are a few things you might want to think about when you first start operating your Lightning off of grass runways if it is your first experience or particularly if it is a runway you have not used before. One reason is that things can change. That grass runway that was nice the last time you used it can be a muddy mess after a rain. And to make matters worse, the surface often varies within the runway itself. There can be low soft spots or the runway surface can be firmer in some areas and softer in other areas. Burrowing animals can make holes and dirt mounds in minutes. All of these things can be potential problems for the tightly fitting wheel pants on your Lightning. And watch out for cow patties, not only are they slick, they can add a strange olfactory sense to an otherwise pleasant experience. Here are some things to think about.

If there is any question at all about the condition of the runway, call the airport owner/operator and ask. Don't count on a NOTAM to address this as very few grass runways are covered by NOTAMs. And you probably need to ask permission to use the runway if it is not a public facility. Some private airport owners like the company but others are concerned about liability insurance issues. So call before you go. Usually one call will get you an OK for future uses without additional calls.

When I arrive at a "new to me" grass field I will often make a low pass (not a buzz job) to take a look at the runway environment. You can often see potential problems like animals or even equipment on or near the runway, trees or power lines near the approach zone, etc. Look for the windsock or other indications of the wind direction. Often different colors of grass on the runway surface, or even standing water, will alert you to potential wet spots to try to avoid. If there is any doubt, wait for another day.

A good close-in pattern and approach will really make it easy. Avoid those big patterns and dragged in approaches. You may be able to get away with that on the long/wide runways, but any lack of proficiency will soon show up when operating on short turf strips, particularly if there are obstructions or other considerations. Fly the correct airspeeds in the pattern and particularly on final. Most GA pilots fly way too fast and are often way too flat on their approaches. You need to be able to control your airspeed to within 5 knots. If you aren't firmly on the runway by the first 1/3 of the runway, go around.

Using flaps is standard procedure, but one good thing about the Lightning is that you have as much as 40 degrees if you need a steeper approach. Accomplish a nice roundout/flair and land on the mains just above the stall speed. You should be at full aft stick for the landing, so keep it there during the landing roll out. During the first part of the landing this technique will initially lessen stress on the nose gear and while the elevator is still effective, it will keep the prop further away from the runway surface to reduce any chance of picking up debris.

If possible, and particularly if the field is soft, you should keep moving during taxi until you get to a parking spot. This will help to keep you from bogging down and reduce the possibility of leaving tire ruts. If you do stop, because of the relatively small 500X5 tires, it may require a lot of power to get your Lightning moving again. A technique I often see at Oshkosh when the aircraft is going to be parked on grass for any extended stay is to place pieces of plywood under each tire to keep the tires from sinking into soft turf. Exercise extreme caution so that you do not prop blast people, other airplanes, or open hangars. Heck, that goes without saying – you should be cognizant of your prop blast at all times, not just at grass runways.

For takeoff, I sometimes do an engine run up while taxiing to the runway to lessen the possibility of having the prop pick up debris. Of course, the above comments about prop blast must be considered. I might even do the mag check at slightly less RPM than normal for the same reason. Bottom line – be

safe.

Flaps set to 10 degrees is a normal takeoff setting for the Lightning and I would use that for a firm grass runway. If the runway is somewhat short, or the field is soft, or the grass is tall, 20 degrees would probably be better. If the field is extremely soft, 30 degrees is a possibility, but under those conditions, you maybe should not have landed there. Consider all factors and perhaps delay your departure until the field has had a chance to dry out some.

I never really use a "rotation" speed, and certainly not when taking off from a turf strip. I always use aft stick during takeoff roll (particularly on a grass strip) for the same reasons as I listed above for the landing roll out – to protect the nose gear and the prop. Also, this technique will tend to reduce rolling resistance on the grass. When the wings get to the right speed the airplane will lift off and fly. After liftoff, a slight reduction of back pressure on the stick will lower the nose slightly to help the airplane accelerate in ground effect. Climb out as needed for obstructions, probably initially at V_x , then going to V_y . If it is a high density altitude day, you may want to retract the flaps in stages.

There you have it. Now I suggest you go out and enjoy a nice grass runway. I think you will like the experience. As always, I invite comments and suggestions.

I hope to see many of you at Sun N Fun.

Blue Skies,

Buz Rich

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