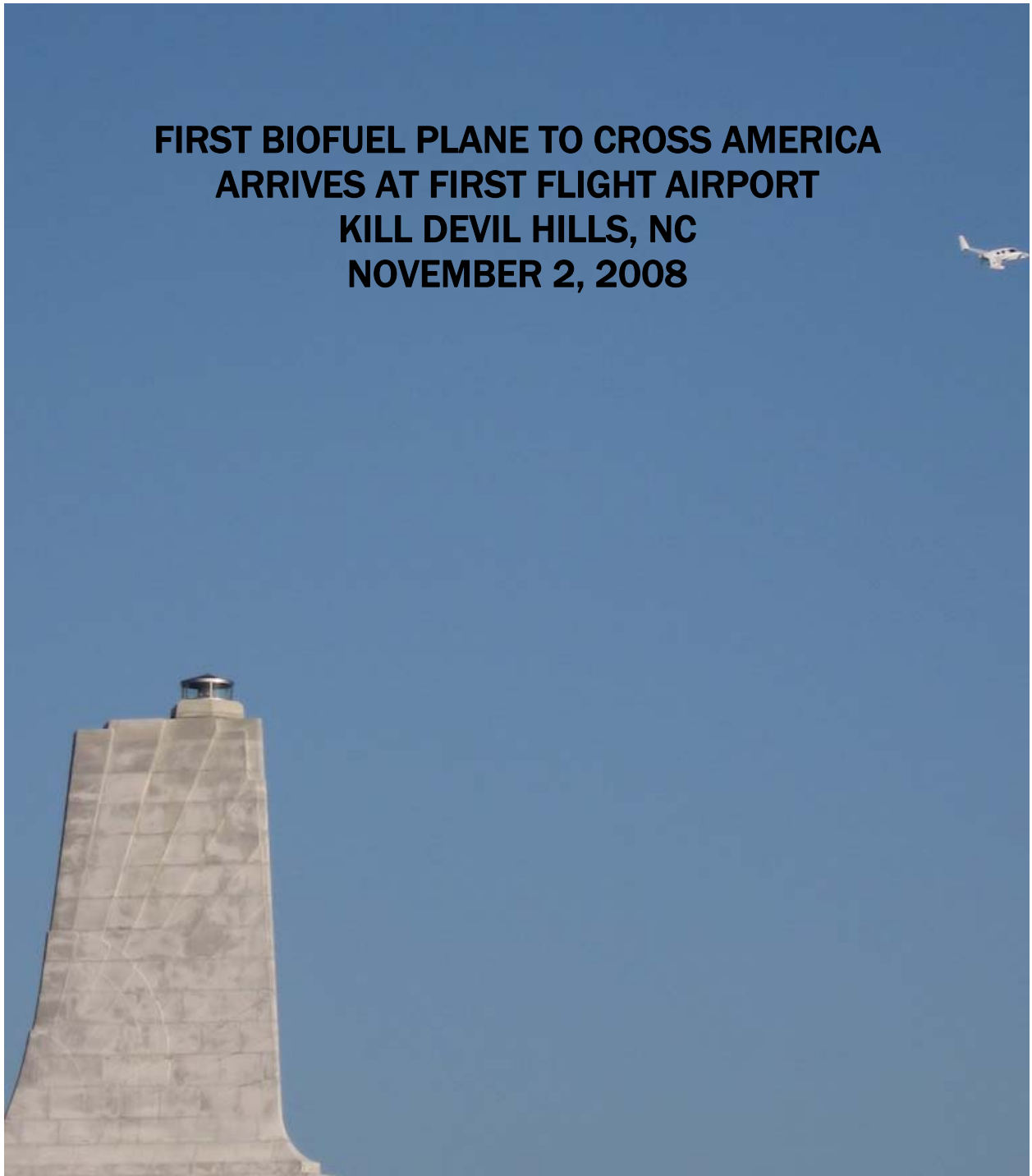


**FIRST BIOFUEL PLANE TO CROSS AMERICA  
ARRIVES AT FIRST FLIGHT AIRPORT  
KILL DEVIL HILLS, NC  
NOVEMBER 2, 2008**



Len Johnson circles the monument at Wright Brothers National Memorial in Kill Devil Hills, NC prior to landing at historic First Flight Airstrip.

*Photo by Lola Hilton*



Just as Orville and Wilbur Wright experienced the hospitality of Outer Banks locals when they performed their experiments over 104 years ago in Kitty Hawk NC, Len Johnson was greeted with smiles and enthusiasm after flying his homebuilt aircraft powered by biofuel across country and landing at historic First Flight Airstrip. A local crowd from the First Flight Foundation and Kitty Hawk Kites had monitored his flight from CA to NC. On hand to celebrate this cross country flight powered by biofuel and to present a Wright Brothers National Memorial "Monument Replica" are First Flight Foundation Executive Director Lola Hilton and President, John Harris.

*Photo by Dave Hilton*



Len Johnson briefs crowd at First Flight Airstrip in Kitty Hawk, NC after his cross country flight using biofuel technology.

*Photo by Lola Hilton*



Len Johnson answers questions about biofuel technology at the completion of his cross country flight from CA to NC and landing at historic First Flight Airstrip.  
*Photo by Lola Hilton*

The plane is secured for the evening as the sunsets and Len is taken to dinner by John Harris, First Flight Foundation President.  
*Photo by Lola Hilton*



# **GET THE LEAD OUT!**

[www.looklocal.org](http://www.looklocal.org)

## **LOOKLOCAL TAKES OFF!**

**Sunday, 10/5/08**

In the coming days and weeks, THH, Inc. will introduce the long-awaited breakthrough California, America, and the world have all been waiting for. Our LookLocal™ solution will make petroleum replacement practical and achievable in as little as 10 years.

The "LookLocal™ Get The Lead Out" campaign will begin with an innovative biofuel flight. Starting from the Pacific Ocean, Len Johnson, our President and CEO, will fly a plane he personally built burning a biofuel to the Wright brothers monument at historic First Flight Airport in Kitty Hawk, North Carolina.

It is appropriate that we publicize this fuel by replacing 100 octane Low Lead (100LL) with a green, unleaded alternative. Biobutanol has potentially broad application- it can be blended with or replace virtually any motor fuel, whether gasoline or diesel.

Len has already solved biodiesel infrastructure hurdles with an invention that provides the capability of producing enormous quantities of vegetable oil, fresh water and salt while replacing jet fuel, diesel fuel, heating oil, and green petrochemical feedstocks by developing local resources within the United States and other countries. This will greatly diminish the influences of the world fuel economy politically, economically, socially, and environmentally while retaining the wealth and jobs our national economy has been sending overseas. Len is now turning his attention to developing an infrastructure solution to replace gasoline with a practical, green alternative, biobutanol.

Neither of Len's solutions will have a negative impact on the world food supply, and will even increase agriculture by delivering water to dry areas.

We are witnessing a watershed moment- an environmentally sound beginning to the future history of hydrocarbon fuels.

Follow the flight [here](#), and see our first YouTube video [here](#).

## **Flight UPDATES**

**Tuesday, 10/28/08**

Thanks to Richard and Art for the flight photos, Shaughn for the work on the great video, Tom for his unfailing support, Sherrie for being my wonderful wife, and all the sponsors who helped make it all possible.

I'm in my hotel in Amarillo after an absolutely wonderful time with Greg Kinnan, a true-blue Texan if there ever was one. He had already eaten, but watched me dig in and even insisted on paying for it! I could get used to Texas. They didn't have the native wine he wanted me to try, which means I have to visit here again. Of course, being a native son, he believes Texas wine to be superior to Californian, but being a scientific-minded person, I have to be shown proof; perhaps lots of it...

The flight was pretty uneventful. Perfect weather, and the folks at Holbrook, AZ where I always take my rest stops were as nice as ever. It's easy to get in and out of, right on the airway, and the runway must be miles long.

Got lots of interesting calls, as you can imagine, mostly from THH folks who were contacted by media. For you media folks, if you're in California we'll have a press conference on Monday- just use the contact information on the web site. Otherwise, Memphis tomorrow night and First Flight the following. I can't take a lot of calls right now, but I want to talk to you all.

I got one call that was particularly interesting- a lady from the First Flight Commemorative organization (I hope I got that right) who seemed genuinely excited about our flight. I'm a Wright Brothers fan and was honored to speak to her. Did you know the centennial of the historic first flight was in 2003? Practically within a single lifetime. It makes my day when I have the opportunity to meet so many nice people in one day who share my interests.

Sorry about the problems with the SPOT- as soon as I can get connected here I'll try and find out what's up with it, so i will work better tomorrow and Thursday.

## Thursday, 10/30/08

Staying over a day in Fort Smith. Ran into a very sharp mechanic here named Tim, and we are poring over a mechanical problem. Cylinder number 3 has been running a little hotter than the others, a condition that is fairly normal for a newly-broken in cylinder (number 3 was replaced during the engine overhaul performed about 30 engine hours ago). However, full power for extended periods now causes rough running in that cylinder. This was a condition that was repaired some time ago whose symptoms have returned. I first noticed this while taking off from Fort Smith, and returned immediately to the airport.

There are any number of things that could lead to a hot cylinder- cooling airflow, intake manifold leak, injector nozzle or fuel distributor imbalance, injection line routing, slag blocking a cooling fin, faulty heli-coil, and so on. It will take at least four hours this morning to check every possibility. I'll keep you all posted.

## Thursday, 10/30/08- evening addendum

Tim Rogers has to be the best airplane mechanic I've ever met, and his company, TACAir, deserves their sterling reputation. If you ever fly through Fort Smith Regional Airport in Arkansas, I recommend them without reservation.

Tim spotted the root problem I mentioned as an earlier occurrence. In Chino, we had a hot cylinder, and I found a broken heli-coil. That's a thing like a spring used in an aluminum airplane cylinder. It's screwed into a hole to provide steel threads for bolts to hold onto. This one was for the spark plug. I replaced it using a new heli-coil and a special plastic tool, then compression tested the cylinder and put it back in service.

What Tim noticed could only be seen with back lighting which he achieved by inserting a tool called a bore scope and looking not through it but at the plug seat illuminated from behind. There were two cracks which were the reason air and other gases were rushing around the plug.

The cracks were there before, but smaller. The stress of a long cross country caused them to run and enlarge, eventually causing the problem at Fort Smith on takeoff the day before yesterday.

I need to stress that this is completely unrelated to fuel. In fact, there is an AD (the FAA's method of communicating a problem) on this very issue, and none of the affected planes are burning n-butanol.

Tim found a cylinder for me in Tulsa, and it is being shipped in to TACAir overnight. If we are able to get it installed and checked out, I will continue the flight sometime tomorrow, arriving in Kitty Hawk on Saturday.

## Friday, 10/31/08

The cylinder arrived, we got it installed and checked out, and test flew the plane. It solved the heating issue, and the plane works beautifully again. That's the good news. The bad news is that, in the entire country, the one severe storm area is directly over Fort Smith to the northwest, and stretches about 100 miles east. That means we can't continue the flight until tomorrow, weather permitting. Small planes can't get over thunderstorms, and it is dangerous to fly near them.

## Saturday, 11/1/08

Well, made it to Memphis in good time. The plane needed some more TLC, provided courteously by the Memphis Commemorative Airforce (CAF) and the Experimental Aviation Association (EAA) Chapter 182. Thanks to Jay (CAF) and Steve (EAA) who helped me with refueling and servicing the plane. Their expertise was invaluable in finding what perhaps might be the root cause for the issue that has been plaguing a small number of Lycoming airplane engines, including mine. Those of you that know me realize I love to try and solve any problem I encounter. I really can't leave it alone until I understand it. The heating I encountered in Fort Smith and to a lesser degree in Memphis had my attention again today. This explanation has nothing to do with biofuels, so feel free to skip it if you're not into planes.

There has been some cracking around the spark plugs in a small sample of engines like mine. This is the problem that has caused me to replace a cylinder and take a close look here in Memphis.

Experimental aircraft often use electronic ignitions instead of older style magnetos in an effort to improve performance. To do this, they occasionally use automotive rather than aircraft plugs. Most aircraft plugs have an 18 mm threaded barrel and while it is possible to find automotive plugs that fit in the holes, that is not the only difference.

Automotive plugs have a smaller circumference around the part that seals the base of the plug to the engine, and they also use a small crush gasket instead of the larger aviation copper seals. This is a subtle but critical difference.

Aluminum aircraft cylinders are lined with steel threads employing a spring-like device called a heli-coil. On overhaul, this area may be drilled out and an insert put in to hold the new heli-coil. Where that insert meets the original block material is a critical seam. Larger aircraft plugs with correspondingly larger copper washers prevent gas leaks through this seam. Smaller automotive plugs with crush washers do not quite reach this area, nor do they provide sufficient base area to properly hold down larger aviation copper washers which do.

The result of not properly protecting against leaks in this critical seam is what I have now twice experienced during this flight. Combustion gasses may penetrate this seam and eventually cut like a torch, expanding any resulting crack in the seam to allow unacceptable amounts of air inflow during the intake stroke, leaning the mixture and causing critical heating of the cylinder whenever stress on the cylinder is maximum, particularly during full-power, low speed operation when air cooling (critical for airplane engines) is at minimum. The result can be potentially devastating, even tragic.

Once a cylinder 'goes critical' as it is sometimes called, it may be cooled by reducing stress and/or increasing cooling air flow. You can do this by throttling back and trading altitude for forward momentum, which means descending. If you don't choose to do this, the engine may ultimately self-destruct. If you do choose to do this, you will rapidly descend. This may mean making a tear-drop maneuver and returning to the runway you just left, going the other way. Depending on a number of factors, this may not be possible. It may also not be possible to remain airborne long enough to circle the airport for a normal landing due to mechanical loss of power. That is what I meant by 'tragic'.

Sorry for the long explanation, but I felt this answer to a rather dangerous puzzle was important. Now, solutions.

I know of two solutions; one, use aviation plugs at all times in aluminum aircraft engines. The other, if you use automotive plugs choose to use smaller 14 mm plugs with an adaptor made by LightSpeed Ignition that has a large enough base to hold aviation copper seals firmly in place, thus preventing potential leaks from developing. The explanation on the LightSpeed website for this device addresses a different issue, that of the ability of large-barrel and small-barrel plugs to handle the higher power output of modern electronic ignitions. It is fortunate that their device also solves the issue I am addressing here.

## **Sunday, 11/2/08- First Flight Airport and Wright Brothers Monument**

As you travel out to the outer banks, the bay is below and open ocean clearly visible beyond the narrow strip of land. The airport is easy to see with the large monument the most prominent feature.

I drew a bead on the mid-point of the runway after ensuring the area was clear of traffic. I entered low and fast with the view of my airplane shielded by the trees lining the mainland side of the bank, and dove into view for the promised fly-by. I came over the trees at maximum maneuvering speed, waved the wings at the Wrights just over the runway, then pulled into a medium G turn to the downwind and pulled up to lose energy. Slowing down to about 100 knots, I pulled around for another pass, dropped low and slow this time and turned a wing up to do a half-circle around the monument, dropped into the base, and turned final for a short approach. The cross-breeze carried the plane a bit, but when the wheels touched I was able to get back to centerline and pull out on the turnabout and shut down. There was no one at this end but a group of a half dozen boys who came running out of the woods to see the plane. This was the best part, and full circle for me. Boys about the age I was when I first became fascinated by pioneers in aviation, about six of them, came excitedly out from the trees to see the plane and ask me to tell them about it. The next generation, but certainly not the last. The true spirit of America lives on. As soon as I finished with the boys I called Sherrie, my wonderful wife, to tell her I was OK. She was excited and so was I, but she quickly told me that I needed to back-taxi 2000 feet to see the welcoming committee. We put off our celebration, and I got back in my plane.

There was a terrific group of people waiting with really thoughtful presents. They took a number of photos, and even listened while I held forth about our LookLocal infrastructure proposal. Most of all, they were interested in the fuel. They seemed genuinely surprised at how clean the pipes and the propeller were. I enjoyed meeting them all. The president of the foundation, John, took special care of me, even loaning me his beach-front house for the night. He took me to dinner at the restaurant from which Orville and Wilbur wired their success to the world. We had a terrific conversation with John and a lovely lady who joined us. There was a copy of the original telegram at the entrance, and a banner we tried to get in a photo a helpful patron took snapped for us using my digital camera. Tomorrow, I get to see the monument and again walk where the Brothers walked, after flying where the Brothers flew. Folks, it just doesn't get any better than this.

After getting back to the beach house, I finally had time to speak to Sherrie. Knowing I'd be a while, I called my oldest daughter who I had accidentally worried on my trip out to the outer banks. After a great conversation with her, I finally got to do what I've wanted to do the entire trip; tell Sherrie that we did it, how much I love her, and to hear her say she loves me. So I was wrong; it does get better.

-- Len