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# AERO



## CONNECTIONS™



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LUCKY STARS II  
COLD WEATHER TIPS





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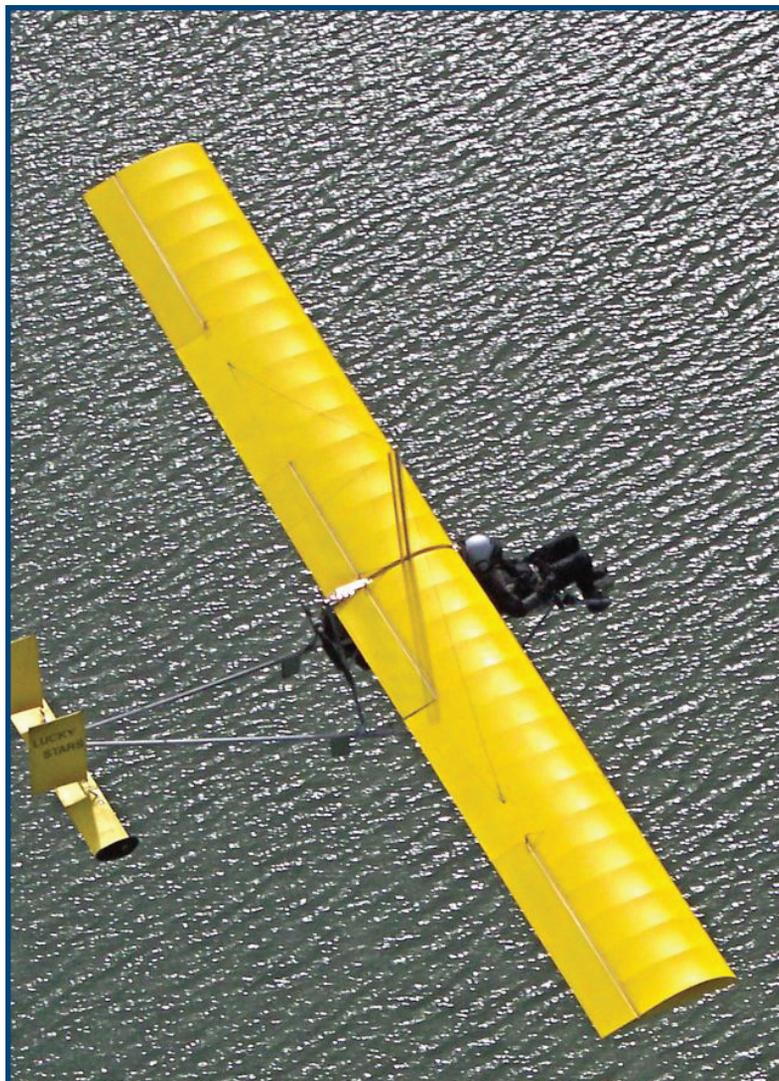


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**CONTENTS PHOTO:** MARK STULL FLYING IN LUCKY STARS II, THE NEWEST OF HIS ULTRALIGHT DESIGNS.

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HOT LINKS ABOUND IN THIS EDITION, they are highlight boxes when you cross them with your cursor FOLLOW THEM TO NEW ADVENTURES

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# FROM THE TOP

## Our Amazing Light Cousins

JIM STEPHENSON  
ASC PRESIDENT AND CEO

The influence of light aviation has moved beyond the limits of imagination. The very same engines that we use, are used in the Predator.. The ASTM committee for Light-Sport Aircraft F37 has been followed closely by the F38 Unmanned Aircraft Committee. We have even held concurrent conferences.

Here are some impressive examples, pay special attention to CQ-10 Snow Goose.

Jim Stephenson

Creech AFB (from internet)  
Has anyone ever heard of Creech AFB? I hadn't, but our Friday night dinner speaker was Colonel Chris Chambliss, Commander of the 432nd (UAS) Wing at Creech AFB.

All of the Air Force's unmanned drones are now operated from Creech Air Force Base, 45 miles northwest of Las Vegas at Indian Springs. They used to run out of Nellis AFB and now have their own Wing at Creech AFB

Some of his comments:

It's the most deadly remote controlled plane in the world. Pilots fly it like a teenager playing a video game. Airmen at Creech AFB can control the Predator drone and the second generation Reaper anywhere in the world. "At least since 2001, Predator's have been airborne 24 hours a day, 7 days a week, primarily over Iraq and Afghanistan .

There has never been a time when we haven't." The unmanned program is so successful it's now under the command of the Air Force. "We are going to increase the number of combat air patrols that we fly with it and the number of hours astronomically," Col. Chambliss said. This year the Predator drone will fly 75,000 hours -- up 20-percent from last year.

Here's an excerpt from the present and the future:

As unmanned aerial vehicles, or UAVs, become a staple of modern military operations, their uses and forms have grown more varied. Today they range from slingshot-launched spybots to global guardians. In fact, the

Continued page 32

# NEXT TO THE TOP

DEB STEPHENSON  
EDITOR IN CHIEF AERO CONNECTIONS  
ASC ADMINISTRATIVE DIRECTOR



Where has the year gone? I can't believe that we are almost to the holidays already. Thanksgiving then Christmas. Wow, while we weren't looking the year ticked right on by...day by day by day...

We hope that you enjoy the magazine that we have put together for you this month. Paul Hamilton has a few tips for cold weather flying, especially around the mountains. So if you're into cold weather flying be sure to check out Paul's article...he has tips that are sure to keep you warm as you fly in the colder climes.

Chuck Raymond's article, you are just going to have to read for yourself! I got it, and couldn't put it down. It really makes you think and points how events and people influence our lives. And how as aviators, we all may be just a little closer in many ways than we realize.

We have a press release written by Dan Grunloh about the powered paraglider dual training exemption. Be sure that you check this out if you're an instructor or looking for dual training in PPGs.

Also we are running a Safety Notice from our PPG Director, Mo Sheldon as he stresses the importance of getting the proper equipment for your flying safety.

For training and the most up to date information check his website at [www.airparamo.com](http://www.airparamo.com). He's our in the state of Arizona, so if you have the need to get out of the cold winter, give him a call and see if you can get some training done while enjoying the warm desert winter.

Our feature for this month is an article by Mark Stull about his latest ultralight plane called Lucky Stars II. Mark is an engineer and designer. He enjoys the challenge of designing and test flying his own aircraft, using his knowledge of aeronautics to see if he can come up with the next greatest flying machine. Check out some of in innovations and tips! This is his 7th design, WOW...he sure loves designing!

Then we also bring you a story about ASC Europe and how the training is going abroad using the ASC syllabus to continue to train pilots and instructors. Helmut Stern is our Director in Europe and spends a great deal of time touring Europe to make sure students and instructors are trained properly.

Blue Skies,

Deb

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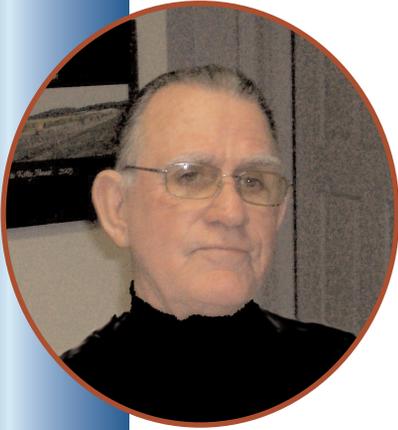
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# Betwixt and Between

BY  
**CHUCK RAYMOND**  
LONE EAGLE AVIATION

I have struggled with what to write this month, as I have a lot to talk about and have decided I can't say it all in one article. So I'm going to take you on a journey of vision, passion and purpose in three steps and show you how aviation has impacted my life and allowed me the privilege to impact others around me all over the world because of a pilot.

I was once asked how I wanted to be remembered and my comment was simply:

**“He made a difference in lives around him with his contagious passion”**

*This journey is not about me so much as what impacted my life and simply what purpose, passion and potential can do in the lives of people around us if we will only give away what was freely given to*

*us. I'm not a highly skilled orator with a lot of formal education, but I am a seasoned and learned man about life through my experiences. My education has become vast over time.*

*So the journey begins:*

---

When I was a kid growing up, my grandpa used to use the saying: **BETWIXT** and **BETWEEN**. That's where I am at in my purpose, passion and vision in life.

The first time I remember him saying that, a friend of his had walked up to where my grandpa was working on a project and ask him how the project was going. My grandpa's comment was, “Well, I'm Betwixt and Between.”

That didn't make a bit of

sense to me at the time. Why didn't he just say something like, “Well, I'm coming along but still got this or that to do yet.”

Oh well, what did I know as an eight year old? I learned over the years to listen to Grandpa, because he was a man of one-liners. He didn't say much, but he got the point across with very few words.

As I traveled the path that life dealt out to me, it was those one-liners that at any given moment helped me survive the crisis of the moment. They became very important to me as my father was not there to guide me. We knew each other but had no real relationship.

I had learned from a young age that my father had a keen interest in aviation but didn't realize the extent until many years later. Actually, it was after

he had passed away that I discovered a lot about my father that I didn't know.

My father hung around (GIF)(Gilbert Field / Winter Haven, Florida) washing planes, fueling them and anything he could do just to get a ride every once in awhile. I found out that he soloed at 16 or 17. I actually had the privilege of meeting the man who taught my father to fly who was only 17 at the time himself. That must have been interesting!



*CHUCK RAYMOND'S FATHER, LEVERNE RAYMOND AT SIXTEEN WHEN HE LEARNED TO FLY AT GILBERT FIELD.*

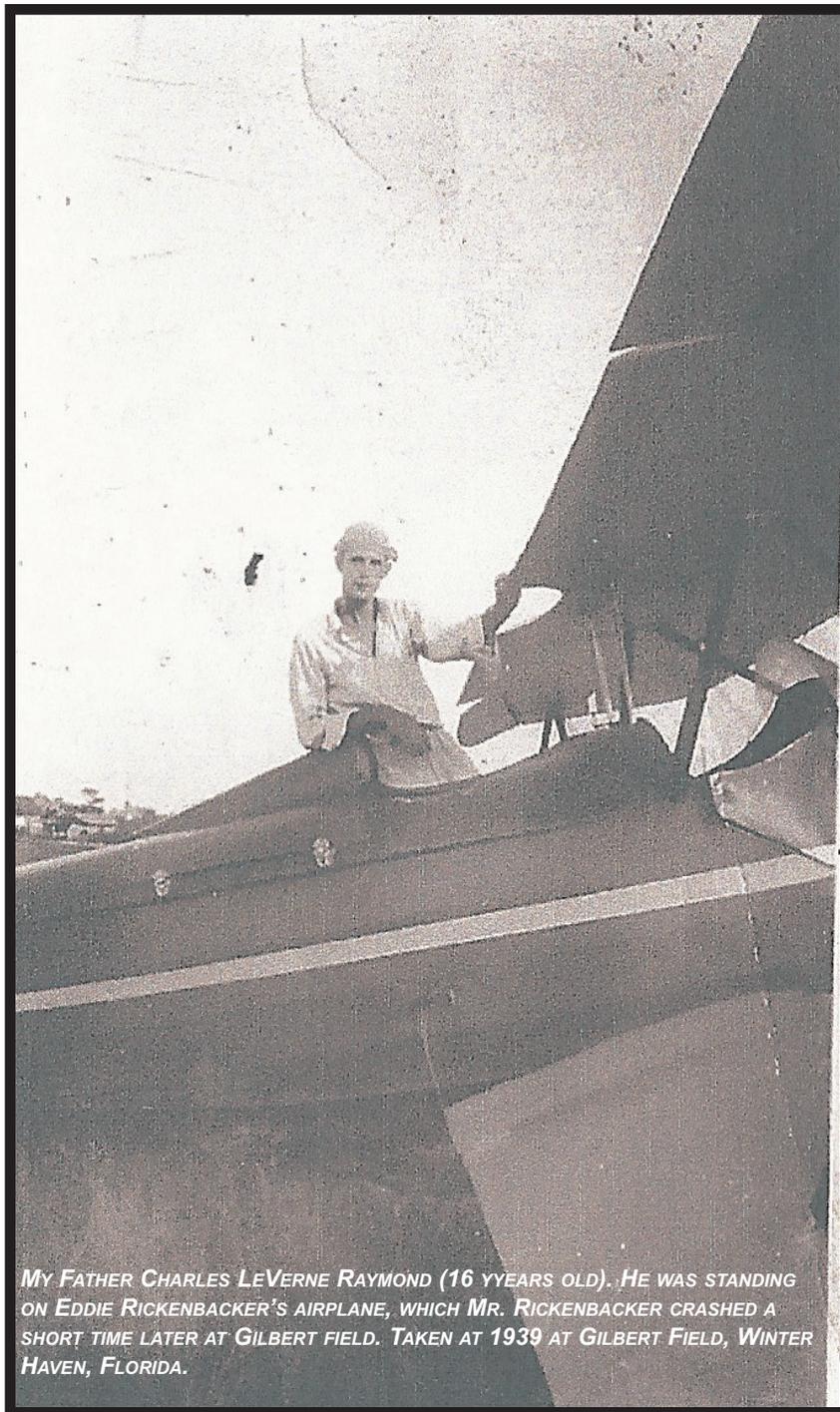
I only have one photo of my dad around an airplane, and he happens to be standing on the plane of a well known aviator of the time who had a home where we were

raised and kept his plane at (GIF). That plane belonged to **General Eddie Rickenbacker**.

For many years I had a newspaper article of an airplane crash that occurred in the swamp off what is now the end of runway 22 at (GIF). My father and a cousin

were the first ones to the crash and pulled the pilot out and to safety. That pilot was **General Eddie Rickenbacker**. A 1939 date is on the photo of my dad on the plane, and it was taken just before the crash.

Shortly after my grandmother



*MY FATHER CHARLES LEVERNE RAYMOND (16 YEARS OLD). HE WAS STANDING ON EDDIE RICKENBACKER'S AIRPLANE, WHICH MR. RICKENBACKER CRASHED A SHORT TIME LATER AT GILBERT FIELD. TAKEN AT 1939 AT GILBERT FIELD, WINTER HAVEN, FLORIDA.*

found out of my dad's excursions at the airport, she forbid him to fly, ending his aviation career. I'm sure it was her fear and lack of knowledge of aviation at the time.

But that didn't stop my dad. He went on to get involved in other exciting endeavors in life; one of which was meeting my mom, and then along I came.

Sad to say their marriage didn't last long. I was raised by my dad's mother and was blessed to have most of everything in life I needed and taught how to work to get the rest. I just didn't have a father

figure. A granny can only be so much in a child's life.

Like most kids of my time, I was raised in a spiritual environment and so on Sundays you would find me in Sunday School.

When I was eleven, there was a missionary to the **Waodani Indians** of Equator who, along with a teammate, came to our little church. As a missionary he told us of their adventures and showed us shrunken heads and bows and arrows. But the two things that impacted me the most: first, he was a man of tremendous passion for these Indians that they could not talk to. However, he was willing to die to tell them the good news that life could be different and second, **he was a pilot.**

He had mastered the art of flying in a circle with a bucket on the end of a rope and could almost make that bucket stand still in one spot as it neared the ground and made it possible to start communication with these Indians never before contacted by outside people. This missionary was so passionate as he described what he did that he actually wept. I had never seen a man cry, but I knew right then that it was OK, and as years went by I learned to understand the natural passion we each have been gifted with.

As adults it seems our society

many times dictates to us to keep that emotion and passion bottled up inside rather than use it for its given purpose. Such a myth and deception to somehow believe that grown men can't or don't cry, and that if one does, it somehow has a negative effect on their manhood.

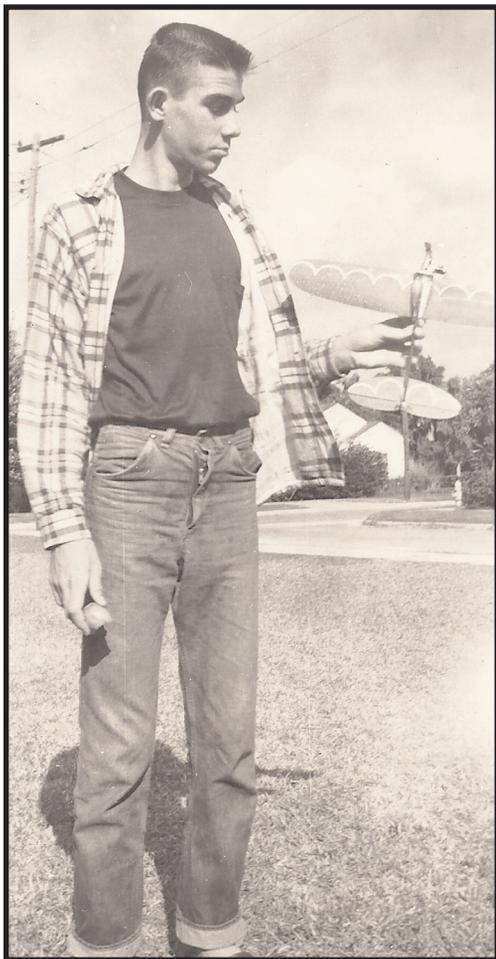
A real man cries if needed, and it's OK!!! **(Just thought some of you men might need to know that.)**

At that very moment in my young life, I knew I wanted to be a missionary and a pilot, but the path my life took dictated that it would be many years yet, and I would climb many mountains before either occurred.

For once in my short eleven years, I had seen what I knew was a true man and father figure, and I wanted to be like him. That impact has never left me even today 57 years later.

Sadly to say, a little over a year later this missionary and four others of his team were killed by the very Indians to whom they were trying to bring good news. That was in 1956. That devastation for me lasted for a long time, because the father figure I had been so impacted by now had been taken away from me.

I had lost two fathers figures now.



CHUCK RAYMOND AT FIFTEEN WITH HIS FIRST MODEL AIRPLANE WITH A GASOLINE POWERED ENGINE.

That missionary was **NATE SAINT**. There have been a couple movies made of these missionaries and their vision...**End of the Spear** and **Beyond the Gates of Splendor**.

You may say, "What this has got to do with aviation?" Be patient and continue this journey, and I will tie it all together.

You may not recognize Nate Saint's name, but his son, **Steve Saint**, will be more familiar to you as aviators.

**Steve Saint** is the founder of **ITEC (Indigenous peoples Technology and Education Center)**

He is the visionary behind the "**MAVERICK**" flying car (**Google it for more exciting information.**)

So, you see from the time I was an eleven year old boy to now, the vision that was planted in me has grown into a developing work in progress.

Steve Saint was five when his father was killed. I was eleven when the only father figure I connected to was killed. We together lost a very important figure in our life. But because we were born with **PURPOSE**, all these years later we are both continuing to keep an original dream alive.

Fast forwarding through many

years of my life to 2004, I was given a unlimited pass to **Sun-n-Fun** in sunny Lakeland, Florida, and as the week passed I saw so many avenues and options in aviation that could be used to help me fulfill my dream to become a pilot, and then use that experience and knowledge to change another eleven year-olds life. I developed a renewed passion for a lifelong dream and vision. Suddenly, I saw hope for what had been for many years a dead vision and the dying of a dream.

In the process of the next six years to this moment, I am having a lifelong dream develop before my very eyes. It is so overwhelming and hard to believe at times.

Since my walk through the vast collections of planes that eventful day in 2004 at **Sun-n-Fun**, I have had the marvelous opportunity to found and am in the process of developing two major parts of my child hood dream, **Lone Eagle Aviation Florida** and **Changed for Life** mentoring program for at-risk-youth.

Next month I will share with you the birthing of Lone Eagle Aviation.

But right now I want to challenge you to spend a little time in the next few days and look back in time at your life. Who impacted you and sparked a dream in you at one time? Who said something or

perhaps even gave you their time to expand and open your heart to a field of dreams that has stayed with you all these years?

I guess my real challenge is to the real men, and that's all of you. When was the last time you were really in touch with the real passion and emotion in your heart?

When was the last time you showed that emotion and passion so someone else knew just what that meant to you?

It is one of life's most changing moments when we touch the real us inside, and then give some away. We have changed part of the world around us when we do.

OK, sunny day...winds down...will go to the hangar, and see how my kids are doing.

**Oh, by the way, if you're interested in more details, I have written a book of my life story. They are FREE for the asking.**

Contact me at:  
**[loneagleavition@hotmail.com](mailto:loneagleavition@hotmail.com)**  
**[or changedforlife@live.com](mailto:changedforlife@live.com)**

I'll be glad to send you one.



## GRAZhopper Data

**Weight:** 14.75 kg  
(32 lbs)

**Seats:** 1 - 2 people

**Width:** 82.5 (210 cm)

**Length:** 69" (176 cm)



A Powered paraglider is also called PPG or paramotor. It is an affordable, safe and legal form of recreational flight that uses a modern paraglider canopy attached to a backpack or small trike with a motor.

Pilot: Bill Wright  
Location: Casa Grande, Arizona  
Photographer: Mo Sheldon  
Date Taken: August 21, 2001



*From our Powered Paraglider*

*Director...Mo Sheldon*

# Buyer Beware!



*Airparamo is an upstanding member of PPGTA*

PPG requires significant training. We will not sell essential PPG flight equipment (i.e. wings or motor units) to anyone until we have verified that they have arranged for training with a recognized instructor.

PPG's look incredibly simple to fly. The truth is that PPG's are probably the most difficult aircraft to launch and get in the air. Although it certainly is possible and legal to train yourself, it is a VERY bad idea. It is very easy to bust up your gear or yourself if you do not know what you are doing. Unless you enjoy emergency visits to the hospital (or the morgue), being a test pilot AND a beginner pilot at the same time is a very bad

idea. If you are looking to save money, consider that a visit to the hospital or replacing a chewed up wing will cost more than the training. At Airparamo we recommend for prospective pilots to find an experienced,

PPG's look incredibly simple to fly. **The truth is that PPG's are probably the most difficult aircraft to launch and get in the air.**

qualified instructor that you like. It is not a bad idea to ask for references or credentials.

Additionally look for an instructor that has an

established flying field that is wide open, free of power lines and dangerous obstructions, free of hazardous vegetation such as cactus and trees with big needles, and preferably with grass. You will be entrusting your life with your instructor. Airparamo conducts its training from huge, grassy, open fields at a number of flying sites around the Phoenix area.

The sport of Powered Paragliding is not governed by any consumer protection. Unfortunately there are manufacturers, dealers and instructors that sell PPG gear as perfectly safe for beginners, that is simply dangerous to take into the air or has not been independently tested to

conform to generally accepted industry standards of safety.

There are two pieces of equipment on a PPG that can not fail in flight: the wing and the carabiners. The fact is, your life is hanging on this gear to not fail. Saving money on the gear that holds your life is not worth the savings.

Reputable wing and carabiner manufactures obtain independent safety certifications on their gear from recognized testing organizations. It costs significantly less to manufacture gear that has not been independently tested and certified.

As a beginner, avoid purchasing or flying uncertified gear since you have no way of knowing if the manufacturer is truthful in their advertising claims. Airparamo only sells and trains beginner pilots on certified wings and carabiners. Insist on nothing less.

For wings, there are several recognized certification bodies: The German DHV and DULV, Swiss SHV, or French AFNOR.

The certification organizations have several functions:

1. load and flight tests
2. rate wings according to recovery characteristics
3. regularly audit the manufacturing process of certified wings
4. test certified gear that is suspect of failure
5. make public announcements of safety and failure of certified gear

As a beginner pilot, look for "Standard" or "1" or 1-2" rated wing. Avoid ratings of "Performance", "Competition", "2", "2-3", or "3". And equally important, at all costs, avoid purchasing or flying uncertified wings claiming to be for beginners. Most instructors refuse to offer training on these paragliders. Additionally, many flying sites refuse to let pilots fly with uncertified beginner paragliders. Lastly, if you are considering resale value, uncertified paragliders may be difficult to sell since they hold little of their retail value.

For carabiners, look for a stamp that contains the markings "Kn"

preceded by a double digit number no less than 18. For example, "18 Kn" signifies that the carabiner was tested to withstand 18 kilonewtons (or about 4047 pounds). Beware of hardware store variety carabiners or carabiners with no manufacturer listed. They are not suitable to trust your life to.

Lastly, be VERY careful of used gear. If you are considering used gear, be sure to discuss your purchase to a trusted expert before you attempt to buy it. The sad truth is that there are many people who have given up on PPG because they bought gear that was inappropriate for them or the gear was not in the condition it was advertised.

If you decide to buy used gear, have a trusted expert inspect it over and fly it before you do. Expect to pay this expert for their time to review your used gear. In addition, if you are considering a used wing, have it independently tested by an reputable paraglider testing company. This normally costs around \$150 and includes a full report on the performed tests and results. Expect to pay extra if any repairs are needed.

## Disclaimer

Any form of aviation is potentially dangerous. In fact, many activities we partake in during the course of our daily activities have the potential to injure, maim, disable, or fatally wound the participant or spectators. Powered Paragliding is no different. We assume that those individuals who choose to participate in Ultralight aviation, including Powered Paragliding, are aware of the risks involved and are willing to accept the responsibility for their own actions and the results that may occur. As a pilot you fully understand that you alone accept all responsibility for your own actions. As a pilot it is your responsibility to insure the safety of your craft and see that the maintenance is properly done. As a pilot, you agree not to sue the owners, designers, suppliers, and pilots who helped design this site, or make information, training, or equipment available through it.

If you are unable to accept responsibility for your actions, and would prefer to sue anybody and everybody looking for a deep pocket in the event you get injured while participating in this sport; or

you would rather partake in an aviation activity that is totally safe, try origami and be on your way. (Note: we have no connection financially to anything related to origami)

The owners, designers, suppliers, and pilots who helped make this site, or make information, training, or equipment available through it have used their best efforts in making the information and supplies available herein, and make no representation or warranties with respect to the accuracy and completeness of the

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Pilot: Bill Wright  
Location: Casa Grande, Arizona  
Photographer: Mo Sheldon  
Date Taken: October 5, 2001

## Who's Mo?

Airparamo was founded and is operated by Mo Sheldon (also known as Maurice Sheldon). Mo started with PPG's many moons ago in March of 1998. He has accumulated thousands of flights on PPG's. Mo has trained numerous pilots to fly PPG over the years. Mo ranked 3rd in 2003 the USPPA national competitions among some of the world's best pilots. Mo earned an Advanced Flight Instructor (AFI) certification in 2003 from Aero Sports Connection (ASC), an organization dedication to promoting ultralights. He earned a Flight Instructor rating from the USPPA in 2005. In 2006 he became a certified USHPA Tow Equipment Operator (Tow Tech). Mo was voted as PPG Wing Director in ASC in 2002 and continues to hold this role. He founded and helped to organize AZPPG, Arizona Powered Paragliding, a local association dedicated to PPG in Arizona. Lastly, visit his outdated personal PPG website -- Mo's Cool PPG Pic's and Stories. ([www.airparamo.com](http://www.airparamo.com))

Prior to starting Airparamo, Mo was a computer programmer/manager in Internet related technologies for about 7 years. He also taught college level computer internet courses at the University of Phoenix and University of Missouri. Prior to that he worked as an Architect intern for a few years. He holds a Masters Degree in Architecture from Washington University in St. Louis and his Bachelors from University of Rochester

Photo to the left: Pilot: Mo Sheldon  
Location: Maricopa, Arizona  
Photographer: Daryl Sawdy  
Date Taken: June 1, 2003



# Lucky Stars II

## High Aspect Ratio Ultralight

BY  
**MARK E. STULL**

This is my 7th original ultralight design, Lucky Stars II. It was completed and first flown in March, 2009. The main experiment with this design was to try higher aspect ratio wings. Its 9.5 to 1 aspect ratio, 34.2' span wings compare to around 5 to 1 of most ultralights. I added a slight under-camber to the Gottingen 387 airfoil to improve low speed efficiency and stall speed.

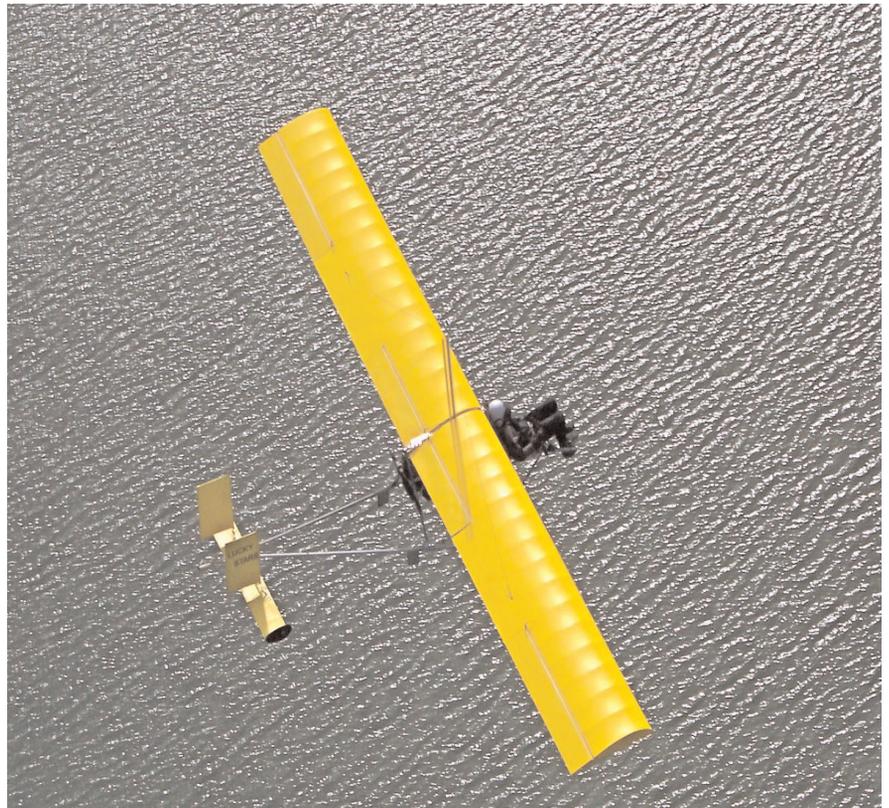
Getting enough strength and stiffness into those long wings added weight. The wings' shorter chord allowed a shorter, lighter fuselage, partly making up for the heavy wings.

I was amazed how much difference the high aspect ratio made. The wings are more efficient, affecting every phase of flight. They glide better, climb better, cruise faster, and need less engine power. They also allow the plane to perform well with a heavy

pilot or at high altitudes. I've taken this plane up to 11,000' where it was still climbing at 100 fpm, even though the engine was losing a lot of power from running rich.

The fan cooled, Kawasaki, 440 cc, 2-stroke, snowmobile engine had way too much power for such an efficient plane. I had to use a

throttle stop, set at about 1/3 throttle, to keep within the 63 mph legal speed limit. I later converted the engine to 340 cc with smaller pistons. It runs smoother and is easier to start with the smaller pistons, but still had too much power. I started using an oversize prop to limit RPM which limits power, and a throttle stop set at





*I ADDED A SLIGHT UNDER-CAMBER TO THE GOTTINGEN 387 AIRFOIL TO IMPROVE LOW SPEED EFFICIENCY AND STALL SPEED.*

about 55% throttle to de-rate the engine down to about 23 horsepower. Later I switched to a tiny 24 mm carburetor.

Even so, the plane climbs very steeply at near 6,000 RPM. I normally cruise at about 5,000 RPM, burning just 1.5 gallons per hour at about 50 mph. That yields an endurance of over 3 hours with the 5 gallon fuel tank. The plane will cruise right up to the 63 mph speed limit, burning up to 2.0 gph if I'm in a hurry.

The other experiment with this design was to try an alternative to leading edge sheeting on the ladder type wing frames. I used a 1' wide strip of heavy covering fabric, where the leading edge sheeting would normally go, shrunk tight between the tip and root ribs. A fillet of expanding insulation foam adds support between the heavy fabric and the leading edge spar.

I found a brand of expanding foam that worked best. But it still came out a bit lumpy looking. The strip of heavy fabric applied tremendous tension on the tip and root ribs. I made those ribs out of 1" thick plywood-

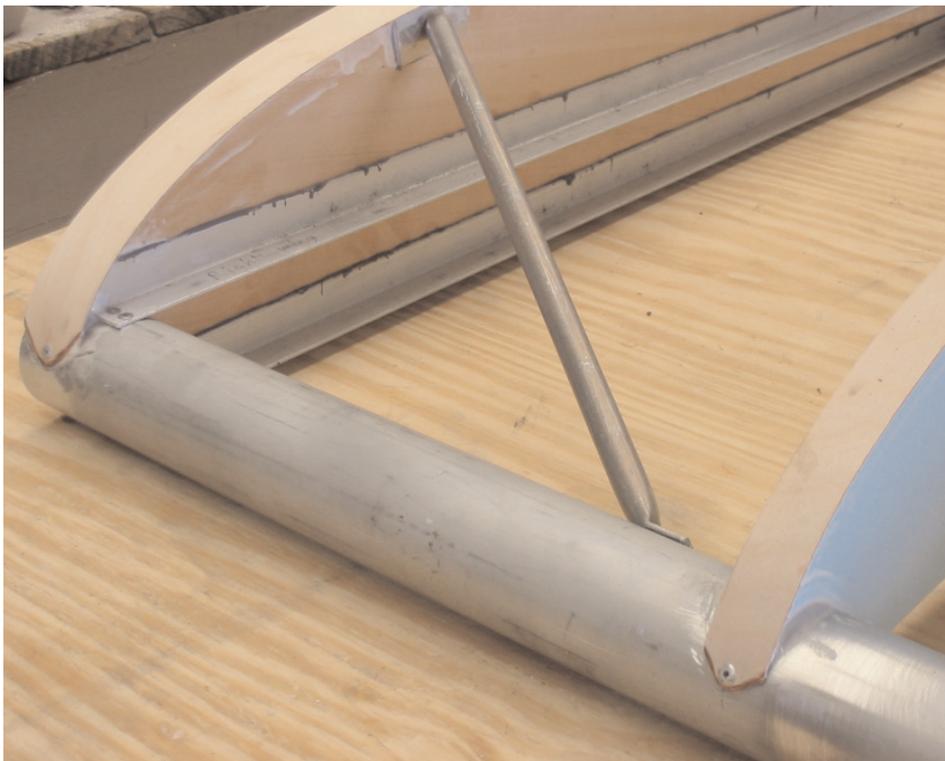


balsa sandwich to take the tremendous load. The sheeting alternative worked, keeping the fabric from dipping between ribs. I doubt I'll use that method again because of the slightly lumpy look. The wings were then covered with light, Stits Poly Fiber fabric and paint.

The wing spars are 2" diameter, 0.065" wall, 2024-T3 tubing. Most of the ribs are made of scrimmed styrofoam with 1/32" thick plywood rib caps. "Scrimmed" means there is a single ply of very light industrial fiberglass on both sides of the styrofoam. The scrim makes the styrofoam much more structural, provides something more substantial for gluing to the rib caps and spars, and protects the styrofoam from the Stits covering chemicals. The "glue" I use for attaching the ribs and rib caps, is a putty made of epoxy micro with a bit of floc mixed in for strength.

The fabric needed no rib stitches or PK screws. Stits sealer is sufficient to attach the fabric to the 5/8" wide, plywood rib caps. The ribs don't touch the fabric on the bottom of the wings. That unsupported bottom fabric stays flat at low ultralight speeds.

The simple, open cockpit is very



for rudder coordination.

The simple wing flaps reduce the required wing area needed to pass the legal stall speed limit. They can be deflected about 60 degrees to alter the glide slope. That can be a significant safety advantage for dead stick landings. The flaps are wonderfully powerful. You can descend ridiculously steeply or use them to shorten the ground roll. The plane also has a BRS parachute system.

One of my concerns with such long wings was a slow roll rate. But the ailerons have a large enough chord that the roll rate is excellent. I added a differential aileron control system to reduce the adverse yaw common on long wings. Even so, it takes a lot of rudder to coordinate. The flaps and ailerons have Lexan gap seals, top and bottom, for added efficiency and control effectiveness.

comfortable and well proven from my earlier designs. All three seat parts are anatomically curved and padded. The seating position is very reclined to reduce wind drag.

Tricycle gear with a steerable nose wheel make ground handling and landing easy. The nose wheel is a wheelchair tire. The 8" OD by 2" wide pneumatic tire and plastic wheel have proven very reliable after more than 1,000 landings. The main gear has no suspension and no brakes. The wheels ride on sturdy, 1-1/8", chrome-moly axles.

The controls are conventional stick and rudder pedals. Instruments are minimal: airspeed; digital altimeter; and digital tach/hour meter. I use no navigation or engine instruments in flight.

The wire looping over the cockpit is the universal attitude reference. The top part is made of 1/8" carbon rod. It has marks on it for pitch attitude relative to the horizon that make it easy to hold a steady attitude in any conditions. I find it more useful than the airspeed gauge. You can tell your yaw attitude for landing by whether

the wire is left or right of the runway. In steep banked turns, you can reference your bank angle with the wire relative to the horizon. Short strings tied to the wire are used



REINFORCED ROOT RIB

The tail surfaces are all full flying, mostly to save a little weight. The full flying rudders, and lack of an enclosed rear fuselage, allow tremendous yaw control for crosswind landings. You can slip the plane up to about 30 degrees. The long wings create a good bit of yaw momentum, noticeable in gusty crosswind landings.

I always try to recycle parts from my previous designs. The cockpit, ailerons, flaps, rudders, stabilator, and nose gear, are all recycled. The stabilator used to be a Junkers style aileron. Its lower surface is well airfoiled. I added carbon tip plates to improve its effective area and aspect ratio.

The engine is mounted very softly on rubber sandwich mounts. I've learned that vibration loads can often exceed flight loads on some airframe parts. I chose to isolate the engine as much as possible, to save airframe weight.

Allowing the engine to vibrate



freely like that tends to cause carburetion problems. The carb can vibrate enough to froth the fuel in the float bowl. And the float needle can be shaken off its seat, allowing excess fuel to flood the carb. I had to set the idle very slow because of the lack of brakes, which exacerbated the problem. I added a second pulse pump that (gently) sucks excess fuel out of the carb's overflow vent and returns it to the fuel tank. It works well, saving fuel and making the engine run smoother at low RPMs.

I also made my own 1-into-2 intake manifold. The stock manifold was designed to slope down with the

puddle by the carburetor. Then when the throttle was opened, the puddle would be sucked in, flooding the engine.

I felt that was a safety issue. If I needed to add power on final approach, the engine could die. My homemade intake manifold resolved the problem. It also holds the carb closer to the engine, where it vibrates less. I wasn't too worried about intake charge flow, since I was de-rating the engine anyway.

The 5 gallon, plastic, fuel tank is off a generator. I like how it tucks under the back of the cockpit without adding drag. I had to use a heat gun to collapse the tank down to the legal capacity.

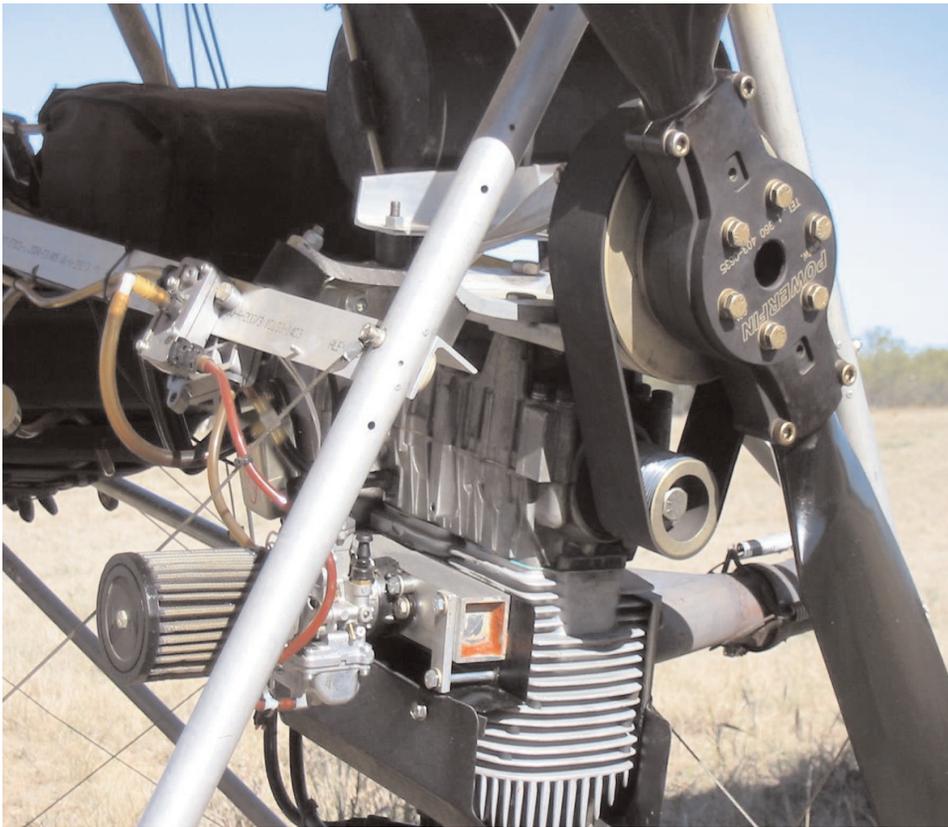
The plane performs better than any other legal ultralight I've flown. It is fun and easy to fly and land. I love the way the long wings seem to defy gravity. It is quick and easy to disassemble for hauling.

If I were to critique the plane, like



AILERON PULLEYS BELOW WING ROOT

engine right-side up. So it was backwards with my inverted engine. Some fuel would condense in it at idle, forming a



ENGINE SUPPORT AND REDRIVE

conventional feel and control harmony with a more conventional tail. But it would add weight.

People at Sun-n-Fun 2010 noted that the tail bobbles around when taxiing on grass, and tilts a little in flight. The rear fuselage is free to twist a bit. It doesn't affect handling or performance, so it's just an aesthetic shortcoming.

The aluminum things that stick down from the rear fuselage booms are feet for the plane to rest on when parked. The rear fuselage booms flexed too much with a normal tail skid. The feet add a bit of drag, but look much better on the ground.



MARK WITH PROP

a magazine test report, I would note the extremely light feel from the high aspect ratio stabilator, and how much rudder it takes to coordinate. This type of stabilator is not self-neutralizing. It would need a servo tab, like a Piper Cherokee, or a horizontal stabilizer in front of it to be self neutralizing. So you can't let go of the stick in flight, even though a trim bungee gives it a neutral feel in cruise.

The plane is stable and flies smoothly, seeking the "trim" speed of wherever you hold the stick. It would be easy to achieve

The open cockpit has the same unobstructed view that trike and PPC pilots rave about. I prefer to use a face shield on my helmet rather than a windshield. I wear an insulated motorcycle rain suit in cold weather.



NOSE GEAR STEERING AND RUDDER PEDDLES

I fly about 3 days a week all year, so the plane is well proven. I love this plane, and would be happy flying it forever. I design my planes to be quick and easy to build, so building is fun and rewarding. It only took 3 months to build, cover, and paint. My designs use no welding. They are made almost entirely of 2024-T3 aluminum. They are completely legal in every way. I just do this for fun, and sell no plans. But y'all are welcome to steal my ideas and construction methods.

I built a new U/L every winter for several years, but took last winter off. I couldn't think of a significant enough improvement to be worth building a new plane. I still can't. But I decided to build a new one this winter. All my designs had pusher engines, so I decided to make my first tractor engined U/L. It will reuse my present wings, so I'm really just making a new fuselage and tail. Construction is well underway. It will have some unusual, experimental features. Stay tuned.

**SPECIFICATIONS:**

**Empty weight:** 225lbs, not counting the parachute system

**Typical fuel consumption:** 1.5 gph

**Cruise:** up to 63 mph

**Stall:** 29 mph clean; 27 mph with flaps down

**Maximum cross wind:** 17 mph

**Engine:** Kawasaki 340, de-rated down to about 23 Hp



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Fiber

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**Wing span:** 34.2'

mstull@wtxs.net

**Wing chord:** 3.6'

**Aspect ratio:** 9.5 to 1

**Wing area:** 122 square feet

**Wing loading:** 3.4 pounds per square foot at typical flying weight

**Maximum gross weight:** 500#

**Prop:** Powerfin 58" 2 blades

**Maximum Load limits:**

At least +3.5 Gs and -1.5 Gs at typical flying weight



SUN N' FUN DISPLAY

# FAA Finalizes Recurrent Aircraft Registration Rule

**For Immediate Release:**

July 19, 2010

Contact: Les Dorr or Alison Duquette

Phone: 202-267-3883  
202-267-3883

WASHINGTON, D.C. – In an effort to create a more accurate aircraft registration database, the Federal Aviation Administration (FAA) is requiring re-registration of all civil aircraft over the next three years and renewal every three years after that.

The rule establishes specific expiration dates over a three-year period for all aircraft registered before Oct. 1, 2010,

and requires re-registration of those aircraft according to a specific schedule. All aircraft registration certificates issued on or after Oct. 1, 2010 will be good for three years with the expiration date clearly shown.

**The FAA will cancel the N-numbers of aircraft that are not re-registered or renewed.**

“These improvements will give us more up-to-date registration data and better information about the state of the aviation industry,” said FAA Administrator Randy Babbitt.

Current regulations require

owners to report the sale of an aircraft, the scrapping or destruction of an aircraft, or a change in mailing address, but many owners have not complied with those requirements.

Re-registration of all U.S. civil aircraft by Dec. 31, 2013 will enhance the database with current data derived from recent contact with aircraft owners. The new regulations also will ensure that aircraft owners give the FAA fresh information at least once every three years when they renew their registration.

The FAA will cancel the N-numbers of aircraft that are not re-registered or renewed.

**The schedule for re-registration and registration expiration is:**

Certificate issued (Any year)	Certificate expires	Re-registration required
March	03/31/11	Nov. 1, 2010 – Jan. 31, 2011
April	06/30/11	Feb. 1 – April 30, 2011
May	Sept. 30, 2011	May 1 – July 31, 2011
June	12/31/11	Aug. 1 – Oct. 31, 2011
July	03/31/12	Nov. 1, 2011 – Jan. 31 2012
August	06/30/12	Feb. 1 – April 30, 2012
September	Sept. 30, 2012	May 1 – July 31, 2012
October	12/31/12	Aug. 1 – Oct. 31, 2012
November	03/31/13	Nov Aug. 1 – Oct. 31, 2012
December	06/30/13	Feb. 1 – April 30, 2013
January	Sept. 30, 2013	May 1 – July 31, 2013
February	12/31/13	Aug. 1 – Oct. 31, 2013

The final rule can be found at:  
<http://edocket.access.gpo.gov/2010/2010-17572.htm>

*ED: There is a very important side note to this "minor" change. If you are an Experimental Light-Sport Aircraft that came in from the previously operating fleet, if your registration expires as above, there is no rule to bring it back into the system. Yes, it will be grounded.*

*Registry it aware of this issue and at last call was not sure of how this would be handled in the future.*

***So, please everyone check your registrations and see what month that you have to send in your renewal registration. This is not something you want to miss!***

***Editors Note: Yes, this is re-run from last month and due to the high volume of calls we are running it again, to make sure that everyone is notified!***



# Cold Weather Flying Tips

BY  
PAUL HAMILTON  
CFI, DPE (SPE / SPIE / PE)



Weather to Fly... Weather to Fly...

I love the change of seasons. The leaves turn, snow blankets the mountains. It gets cold. But cold is a relative term. We will define cold as any temperature down to freezing, 32 degrees F or 0 degrees C. We will define “real or REALLY cold” any air temperature BELOW freezing.

Always consider what you might have to do to get more airtime per flight and being prepared to fly in the cold will help this. Many times some of the most beautiful flying will be when it is cold.

The concept of just dressing warm to fly in an open cockpit airplane when it is cold works good most of the time. However, many people believe just dressing warm will work if it gets REALLY cold. Most of the time you need some sort of auxiliary heat to fly for an hour or more. I have tried it, it does not work.

If it is just below freezing (30 degrees F) with a 30 MPH

wind chill (this is a slow PPC speed for example) this equates to -2 degrees F below zero wind chill. If it is a little faster and colder this can easily drop to -20 below zero wind chill. This is really, really cold. If your hands are out in the wind they will not last.

Everyone I have seen dressing good with warm looking bar mitts and/or good gloves, can last maybe half an hour if it is really cold, than

come back in agony with frozen hands.

The one I remember best was when it happened to me. The day started in Truckee California, sometimes the coldest place in the US. It was calm and nice, about 25 degrees F. It was a 30 minute flight to get back to my home airport but had to climb to 10,000 to get over a ridge and back to Carson City Nevada. I knew it would be cold but I did not expect



A VIEW OVER THE NOSE OF THE TRAIKE OF SOUTH SHORE. PHOTO MY PAUL HAMILTON.

I love the change of seasons. The leaves turn, snow blankets the mountains.



what happened. While flying back 15 minutes into the flight, my hands got so cold I could not grab onto the bar. Flying it with the bar under my elbows seemed to work best and also squeezing the bar between my forearms provided enough control to safely land. What a lesson to learn! Something had to be done to fly when it was really cold.

The heat pads used by hunters to put in their gloves and boots are a great start. They are generally inexpensive and can be carried and used as required if you generally do not plan to consistently fly in the cold and really cold but could be used if you need them.

I soon discovered that the motorcycle shop had 12 volt electric gloves, socks, pants and jackets. The problem is solved. Hook this to your battery and you have a very efficient heating system for any 12 volt aircraft system. Think of the extra comfort and

enjoyable time you can spend in the air. Great technology we can use from our motorcycle cousins. This will apply to all 12 volt aircraft systems, including enclosed aircraft with marginal heating systems.

You can easily run two pairs of gloves and one pair of socks off a common Rotax 2 cycle engine with a battery. If put some of those “hunter heat packs” near the students toes, and you can easily fly around for 2 hours in comfort dressed warmly. Heated gloves and socks running full blast provide plenty of heat when you also dressed warm. I added a simple voltage meter to the aircraft battery to help figure out if the system was charging or draining.

Each pair of gloves and socks are 22 watts – each totaling 66 watts for 3 sets.

This is quite a bit of juice. A hand held radio is only 5 watts

output. Producing heat takes a lot of electricity. My simple ROTAX 503 puts out about 175 watts at full power and significantly less at idle.

Adding a jacket at 77 watts in addition overloads the electrical system and drains the battery at idle but can produce enough electricity at 5500 RPM cruise. If you want the extra heat, perhaps a vest at 44 watts will help you squeak by.

Also note that if you bring something along to push the radio buttons since this is near impossible with big gloves, you do not have to take off your gloves to change frequencies. A pencil eraser works great for this.

When it gets cold, turn your half hour flights of suffering cold into 2 hour flights where you are warm and cozy.



# ASC Europe in Poland

BY  
HELMUT STERN  
 ASC DIRECTOR, EUROPE



PRACTICAL TRAINING ... IN THE AIR ... LOW FORMATION FLIGHT OVER A SMALL POLISH VILLAGE ... MAGNI M24 ORION (RED) WITH JERZY GRABOWSKI/EUGENIUS, MAGNI M16 TRAINER (WHITE) WITH ALOJYZ DERNBACH/DANNY BELLENS AND ELA 07 WITH KAMIL ANTKOWIAK/ROMAN ROCLAWSKI

The ASC Basic Flight Wing Director, more and more people from Europe and other countries. As ASC Europe countries are contacting ASC Europe to help them open new areas.



PRACTICAL TRAINING ... ON THE AIRFIELD EUGENIUS / BIALYSTOK ... BRIEFING FOR A COMMON FLIGHT WITH 4 AIRCRAFTS ... IN FRONT OF A MAGNI M24 ORION ASC BFI DANNY BELLENS INFORMED ABOUT SAFETY REASONS

My Polish contacts were asking me at the AERO in



ORAL EXAMINATION ... ON THE AIRFIELD TUROGO KOCIELNA / BIALYSTOK ... BFI APPLICANT JERZY GRABOWSKI IS TEACHING THE LESSON CROSS COUNTRY FLYING TO HIS 'STUDENT' DANNY BELLENS

Friedrichshafen (April) for help with a BFI license course. They want to bring gyrocopter flying into their

country, but a licensing system is needed as a concept for presentation to the CAA. I'm all the time in contact with them. The pilots like the new ASC license card!

We traveled 1100 kilometers north to Airfield Turoceń Kościelna – Białystok to enjoy six sunny days of flying. It was a very exciting week in Poland with really good candidates. Applicants are Alojzy Dernbach, Kamil Antkowiak and Jerzy Grabowski. With the background of many years of flying experience, exceptional flying skill and a great sense of responsibility of all three participants, it was easy for us to train them and to introduce the ASC system. Kamil, Alek and Durek are excellent flight instructors and good new representatives for ASC!

Poland is a country with many freedoms for flying. We were also very surprised at the great hospitality in this land. The team of ‘Liberty Fly’ can present a nice and cheap spa hotel, few airfields and aircrafts for rent.

The ASC system requires both a BFI and an AFI (examiner) to



*PRACTICAL TEST ... ON THE AIRFIELD TUROCEŃ KOŚCIELNA / BIAŁYSTOK ... BFI APPLICANT ALOJZY DERNBACH (BACK SEAT) ON THE CHECKFLIGHT FOR HIS BFI LICENSE WITH EXAMINER ASC AFI HELMUT STERN*

approve new BFI's My assisting BFI in the Poland BFI Training Course Poland was Danny Bellens. Danny is a native of Belgium and former F14 Tomcat and F16 fighter jet pilot and instructor in the USA.

After an accident (ejection seat exit due to a bird strike in low flight to the bomb range) with serious injuries he moved into film business and became one of the 10 best Special Makeup Artists in the world. Danny made the effort come together.

Altogether, it was a great 6 days of serious flying and overall fun making inroads in the Polish airspace. We left behind three well qualified instructors and a system that works, ASC.

Thanks to the ASC Team and Jim Stephenson for making the system work.

Helmut Stern, ASC Europe Wing Director.



*THEORETICAL EXAMINATION ... IN THE HOTEL „SPA ZDROJOWKA“ ... THE BFI APPLICANTS WORKING ON THE ‚FUNDAMENTALS OF INSTRUCTION‘ TEST ... FROM LEFT: ALOJZY DERNBACH, KAMIL ANTKOWIAK AND JERZY GRABOWSKI*





PRACTICAL TRAINING ... ON THE AIRFIELD TUROŃO KOŒCIELNA / BIALYSTOK ... PREFLIGHT BRIEFING ... BFI APPLICANT KAMIL ANTKOWIAK (RIGHT) WITH HIS ‚STUDENT‘ DANNY BELLENS



PRACTICAL TRAINING ... ON THE AIRFIELD TUROŃO KOŒCIELNA / BIALYSTOK ... PREFLIGHT BRIEFING OF BFI APPLICANT ALOJYZ DERNBACH (RIGHT) WITH HIS ‚STUDENT‘ HELMUT STERN



PRACTICAL TRAINING ... IN THE AIR ... WITH MAGNI M16 ON APPROACH TO A PRIVATE AIRFIELD ‚EUGENIUS‘ NEAR BIALYSTOK ... BFI APPLICANT JERZY GRABOWSKI (FRONT SEAT) WITH HIS ‚STUDENT‘ HELMUT STERN

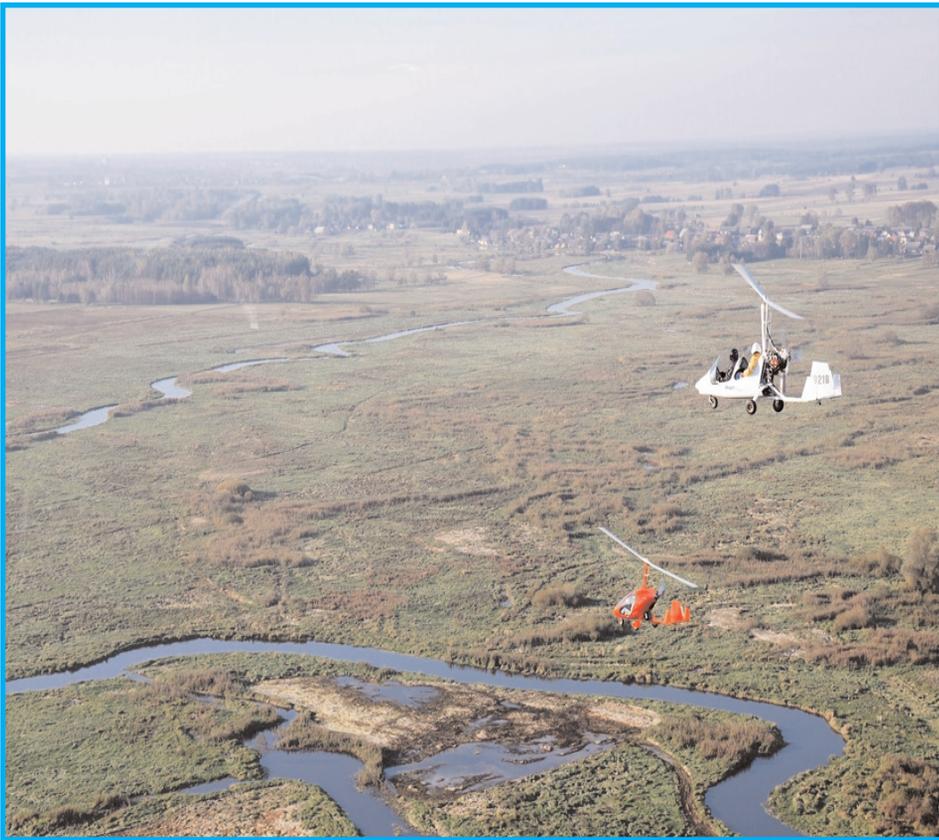


PRACTICAL TRAINING ... ON THE AIRFIELD TUROŃO KOŒCIELNA / BIALYSTOK ... SHORT BREAK FOR INSTRUCTOR ASC BFI DANNY BELLENS



PRACTICAL TRAINING ... ON THE AIRFIELD TUROŃO KOŒCIELNA / BIALYSTOK ... OUTDOOR OFFICE FOR TRAINING DIRECTOR ASC AFI HELMUT STERN

The ASC Basic Flight Instructor system goes on to support light aviation in other countries.



# ASC Europe in Poland

PRACTICAL TRAINING ... IN THE AIR ... FLIGHT THROUGH A GREAT COUNTRY SIDE IN THE NORTH-EAST OF POLAND ... MAGNI M24 ORION (RED) WITH JERZY GRABOWSKI/EUGENIUS AND MAGNI M16 TRAINER (WHITE) WITH ALOJZY DERNBACH/DANNY BELLENS



THEORETICAL TRAINING ... IN THE HOTEL „SPA ZDROJOWKA“ ... BFI APPLICANTS PREPARING THE TEACHING LESSON CROSS COUNTRY FLYING FOR THEIR ,STUDENTS‘ ... FROM LEFT: ALOJZY DERNBACH, JERZY GRABOWSKI AND KAMIL ANTKOWIAK



PRACTICAL TRAINING ... ON THE AIRFIELD EUGENIUS / BIALYSTOK ... DEPARTURE TO THE COMMON FLIGHT ... WITH MAGNI M24 ORION (JERZY GRABOWSKI, EUGENIUS), ELA 07 (KAMIL ANTKOWIAK, ROMAN ROCLAWSKI) AND MAGNI M16 TRAINER (ALOJZY DERNBACH, DANNY BELLENS)





SUCCESSFULLY FINISH ... .. IN THE HOTEL „SPA ZDROJOWKA“... ASC EXAMINER HELMUT STERN AND INSTRUCTOR DANNY BELLENS GAVE THE NEW BFI'S AN ASC PTS (PILOT TRAINING SYLLABUS ... FROM LEFT: DANNY BELLENS, KAMIL ANTKOWIAK, ALOJYZ DERNBACH, JERZY GRABOWSKI AND HELMUT STERN



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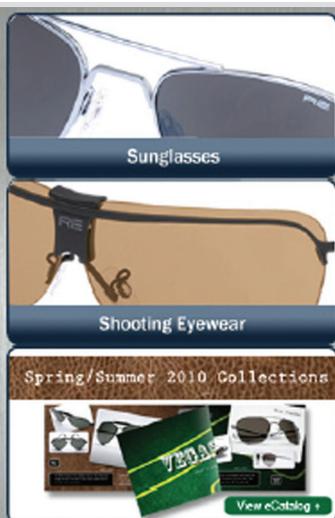
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acronym itself may be morphing into UAS (unmanned aerial systems) to indicate that these are not just aircraft, but systems that include ground stations and other elements. It's not just the military that uses them -- police use the same technology for surveillance, while terrorists build flying suicide bombers. Check out the stealthiest, deadliest and highest flying drones in use today, and the UAVs that are most likely to be making



tomorrow's headlines.

#### Smallest

WASP is the smallest UAV in use today, weighing less than 300 grams. The miniaturization is achieved by the use of multifunctional components, like the combined wing/battery. WASP is nearly silent and, when flown at night, it's almost undetectable. The Air Force has just ordered several hundred for reconnaissance and bomb-damage assessment.

Photo: U.S. Navy

#### Most Famous

The MQ-1 Predator was an evolution of the earlier Gnat-750. Originally intended purely for reconnaissance, it was later armed with a single Hellfire missile. This combination appears to be extremely effective at precision strikes according to the Department of Defense, which claims a



success rate of "nearly 100 percent." Predators are used by both the Air Force and the CIA.

Photo: U.S. Air Force



#### Deadliest

The MQ-9 Reaper is a scaled-up version of the Predator, larger, faster and more powerful. Reaper was designed from the outset as a hunter-killer. It can carry up to 14 Hellfire missiles or other weapons such as the 500-pound, laser-guided bombs shown. The 432nd Wing of the U.S. Air Force was activated to operate MQ-9 Reaper on May 1, 2007.

Photo: U.S. Air Force



#### Widest Range

The RQ-4A Global Hawk is the Air Force's endurance drone, able to cruise at around 400 mph for 35 hours. It has an operational ceiling of 65,000 feet, and from this altitude it can scan an area the size of Illinois (40,000 nautical square miles) in just 24 hours. It is equipped with radar and infrared, as well as optical sensors.

Photo: U.S. Air Force



### Stealthiest

The Joint Unmanned Combat Air System demonstration program, or J-UCAS-D, is intended to be the forerunner of the next generation of stealthy robot-strike aircraft. Its geometry and radar-absorbent materials make it difficult to impossible to spot on radar, as well as making it look "badass." Operating from aircraft carriers, the UCAS-D could fulfill the Navy's goal of an aircraft that can carry a payload (such as bombs) of up to 2,000 pounds, plus an extra 2,500 pounds externally when stealth is not required. A typical use would be to send unmanned drones in as a first wave to take out enemy air defenses and clear the way for manned aircraft. Photo: U.S. Navy

### Most Welcome

The CQ-10 Snow Goose is a parafoil-wing UAV for carrying medical equipment or other urgent supplies to Special Forces operating in unfriendly territory. The flexible wings are made of textile, like a parachute. The Snow Goose can be launched from the ground or from the loading ramp of a transport aircraft. Range



and payload are inversely proportional; the CQ-10 can carry a 75-pound payload for 200 miles, or 500 pounds for a shorter distance depending on launch altitude and wind speed.



Most Alarming The MIRSAD-1 drone has been flown over Israel by the Lebanese militia group Hezbollah (mirsad means "ambush" in Arabic). It may be armed; Hezbollah has claimed that it can be loaded with a warhead of 40 to 50 kilos (90 to 110 pounds) of explosives, turning it into a flying suicide bomber able to reach anywhere. The Israeli Defense Force shot down two similar drones in 2006. Image: Hezbollah



### Highest

HELIOS was NASA's record-breaking solar-powered flight demonstrator. It achieved an altitude of more than 96,000 feet -- the highest for any aircraft not powered by a rocket. A combination of solar cells and fuel cells meant it could, in principle; stay aloft for days, weeks or even months at a time. The vehicle broke up in 2003 during a flight near Hawaii when it hit turbulence, but the military is rumored to be continuing research into solar-powered UAVs with ultra-long endurance (vehicles capable of many hours in flight)



### The Toughest

The Battle hog 150 is intended to meet the Marine Corps requirement for a vertical takeoff drone capable of operating from aircraft carriers. It can fly at over 300 mph with a payload of 500 pounds, with armaments likely to include Hellfire missiles, rocket pods and 7.62-mm mini-guns. The Battle hog series is designed to be as robust as possible, being able to withstand small-arms fire from close range. The drone is

steered entirely by moving the two wingtip fans, so there are no vulnerable flight controls. Image: American Dynamics Flight Systems Wingspan



### Most Modular

The Killer Bee is part UAV, part missile. It's intended to be deployed in 'constellations' of many vehicles working cooperatively. These swarms can be used for either reconnaissance or for attack with up to 30 pounds of weapons per drone. The Killer Bee is designed so several can be stacked together in the cargo bay of an aircraft or in a truck, maximizing the number that can be carried. Photo: Northrop Grumman



### Most Local

The German-made Micro drone is equipped with GPS, a camera and a loud-hailer to give instructions to those on the ground, and is currently being tested by police in the UK . This type of UAV is the one you're most likely to see hovering around your neighborhood. Its quadrotor design is intended to make it resilient -- Micro drone can return to base with just two rotors. Law-enforcement officials hope the

Micro drone can carry out some of the tasks of police helicopters, but at a fraction of the cost.

Photo: Micro drones GmbH



**Carrier Copter** The MQ-8 Fire Scout made by Northrop Grumman is operated by the U.S. Navy and can make an automated landing on a moving aircraft carrier. Typical missions include surveillance, locating targets and directing fire. There have also been weapons tests with a Firescout armed with 2.75-inch rockets. The U.S. Army has now shown interest in having its own version. Though nine MQ-8 vehicles are in the flight-test stage, the model is not yet operational. The Navy plans to eventually have a fleet of 168. Photo: U.S. Navy



### Future Force

The Honeywell MAV, or micro air vehicle, will be an integral part of the U.S. Army's Future Combat System, giving reconnaissance capability to front-line troops. The small 'Class I' version seen here will be back-packable. It has a planned weight of 20 pounds, and is capable of a 50-minute mission spying on locations up to

half a mile away. The vertical takeoff and hovering capability make it well-suited to the urban canyons of the modern battlefield. Photo: U.S. Army



**Most versatile** The morphing micro air/land vehicle, or MMALV, is a hybrid that can fly, then land, fold up its wings and crawl around buildings or other tight spaces. The MMALV project is lead by Bio Robots, in collaboration



with the Biologically Inspired Robotics Laboratory at Case Western Reserve University, the University of Florida and the Naval Postgraduate School. Photo: Richard Bachmann,

### Marine's Friend

Originally used for tracking schools of tuna, the Scan Eagle drone is used by the Marine Corps in Iraq, where various versions of the model have flown several thousand hours of missions. It has a stabilized, gimballed camera turret that can be fitted with either daylight or infrared imagers. No runway is required; instead it is fired aloft by a pneumatic launcher and retrieved by a rope-and-hook where a crane snags it out of mid-air.



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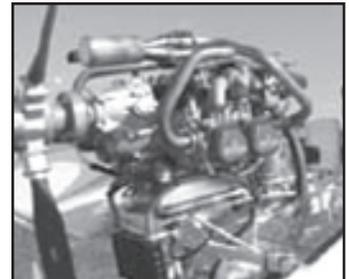
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